Seeds of Suicide

The Ecological and Human Costs of Seed Monopolies and Globalisation of Agriculture

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Dedicated to
the Farmers of
India
who committed
suicide, with a hope
for a farming
future which is
suicide free.

Contents

Seeds of Suicides

Introduction

Seed is the first link in the food chain. It is the primary means of production in agriculture. Over the centuries, seed has been evolved by farmers. Farmers have been breeding diverse varieties to adapt to diverse ecosystems, diverse economic and cultural needs. Farmers seeds have been tested over centuries. Farmers have freely saved and exchanged seed, they have freely planted diversity of crops to maintain ecosystems, meet their diverse needs and earn incomes.

In the mid 60's, new varieties with high response to chemicals were introduced. The public sector seed supply was made a major component of agricultural development with funds and aid from the World Bank. However, farmers seeds continued to account for 80% of the seed supply.

In 1988, the World Bank which had financed the growth of the public sector seed supply in the 60's and 70's demanded its dismantling and recommended the shift to the private sector and an entry of MNC's in the seed sector.

The Research Foundation for Science, Technology and Ecology has been monitoring the impact of trade liberalization policies on Indian farmers and Indian agriculture since the new economic policy was introduced in 1991 and since the WTO rules of the Agreement on Agriculture came into force in 1995.

The increasing costs of production and the falling farm prices that go hand in hand with globalisation, combined with the decline in farm credit is putting an unbearable debt burden on farmers. This is the burden that is pushing farmers to suicide.

Government agencies have deliberately delinked the economic crisis farmers are facing from the psychological stresses that this results in. An attempt has been made to reduce the biggest crisis the Indian peasantry has faced in its long and ancient history to the problem of alcoholism and adultery, in order to protect the unworkable and non-sustainable trade liberalization policies as the basis of agriculture. The non-sustainability was exposed in Cancun at the WTO ministerial. At the negotiation level the talks collapsed because the group of 20 rejected a system of unfair rules for agriculture trade, which destroys small farmers by forcing open up markets to dump artificially cheap, dishonestly priced agricultural products subsidized with $ 400 billion dollars.

At the human level the non-sustainability of the current agricultural system was symbolized in the suicide by Lee Kyung Hae, a Korean farmer, who took his life at the barricades of the peoples protest against the WTO ministerial.

As he stabbed himself, he carried a banner stating "WTO kills farmers."

During the ceremony, to honour Mr. Lee's sacrifice the message was, "the sacrifice of Mr. Lee was not in vain. His spirit of struggle will live on in our hearts as we keep fighting for the better world that is possible."

Mr. Lee's suicide was symbolic of the suicides of thousands of farmers.

In this report, fourth in our series on farm suicides, we show how farmers are paying for corporate led globalisation with their very lives. We hope that the failure of WTO talks in Cancun and the high human cost of farmers suicides will provide a momentum to shift agriculture and trade policy towards justice, sustainability and the defense of farmers human rights to their lives and livelihoods.

The report on "seeds of suicide", which we have been updating since 1997, covers three aspects of the impact of the new policies of the so called "liberalisation" of the seed sector. Firstly, it shows that the trends towards privatisation and concentration of the seed industry and displacement of farmer varieties. A shift from government control to farmers control was the option foregone at the national level. The consequences of giving seed companies a free hand through privatisation and deregulation has been increasing the costs of seeds and agrichemicals for farmers, increasing farm debts and increasing crop failure. Farmers suicides are the extreme result of these policies of market freedom. Farmers are falling prey to the marketing strategies of seed companies. Globalisation is leading to the emergence of a new kind of corporate feudalism – the convergence of global market forces with the worst forms of feudal control. The removal of the public sector and the undermining of the community in the seed supply has allowed the reemergence of the feudal power of land lords and moneylenders, empowered by global corporations, their products and their capital. This Corporate power is working through feudal structure to capitalise seed markets. The seed and agrichemical companies use the local rural elite, the land lords and money lenders for selling seeds and pesticides for providing credit to poor peasants for buying those high cost inputs. This Corporate feudalism is leading to an epidemic of suicides. It has rendered agriculture socially, economically and ecologically non-sustainable.

The fourth edition of the report on "Seeds of Suicide" also updates the performance of genetically engineered Bt cotton. Chapter 3 is a report of the first large scale trials of a genetically engineered crop – Monsanto's Bollgard Cotton in India and the repeated failure. The final chapter of this report offers alternatives to the corporate control over seed by rejuvenating the public sector under farmers control and strengthening farmers seed supply through community seed banks. The case study on the Terai seed farm also shows how privatisation and globalisation was not the only alternative. The Tarai Seed Corporation is an example of revitalising a public sector seed farm through farmers participation and control. Navdanya is a pioneer in setting up community seed banks. The Navdanya movement was started to conserve farmers varieties and agrobiodiversity, to make ecologically adapted organic seeds available to farmers so that farmers have alternatives to high cost seeds, toxic chemicals and patented and genetically engineered crops.

The freedom from patents, from genetic engineering, from toxic chemicals and from debt is what seeds of freedom bring to farmers. Navdanya defends

the farmers inalienable right to freely save and exchange seed. It brings seeds of hope as an alternative to seeds of suicide.

This study has been updated over a decade, during which period different associates have contributed to parts of it. Tom Crompton worked with me on Seed Monopolies, Ashok Emani and Afsar Jafri, worked on Bt cotton performance in the earlier stages, Manish Pande carried out research on the Terai Seed Corporation.

Kunwar Jalees has been working with me on Bt cotton and farmers suicides over the past 4 years. This sustained effort to make visible one of the biggest tragedies of our times would not have been possible without our friends and associates in different regions – Jaijee and Gopal Iyer in Punjab, Malla Reddy and K R Choudhary in Andhra Pradesh, Ram Kalpuskar and Kishore Tiwari in Maharashtra and Members of KRRS in Karnataka.

Vandana Shiva

CHAPTER I

The Changing Nature of Seed*

From Public Resource to Private Property

'We aim to transform Indian agriculture from a passive, conservative, traditional form, to a vibrant, progressive, scientific and enterprising one. [This] process can be described as a revolution initiated by the farmer, for the farmer, through the farmer'.

Mahyco corporate literature

'We don't sell seed; we sell profit'

Bioseed Genetics corporate literature

1. Diverse Seeds for Diversity

Farmers have for millennia studied, identified, modified, cultivated and exchanged seeds freely in order that they may provide for themselves the best for their utilisation. In this capacity the farmer has always been a scientific plant breeder. Farmers have traditionally conserved and developed this diversity in their fields through on-going cultivation of the varieties. As the farmer produced mainly for the family, the village, and then the rest of the world, with the main vision being sustainability of both lifestyle, and nature (including land and water resources), it was in his interest to conserve the plant varieties developed by him.

Genetic diversity is essential in agriculture for developing plants with characteristics to suit the ecological conditions, nutritional needs and other uses by farmers and for conferring at least partial resistance to diseases. Therefore, it is important to understand biodiversity in its totality and not just in terms of food crops alone. There exists a symbiotic relationship in the ecological niche in which the crops grow. Diversity plays an important role in nutrient cycling, controlling insect population and plant disease. Thus, on-field conservation of all diverse plant wealth is imperative for sustainable agriculture.

Seeds of agricultural crops have been developed over centuries by farming communities across the world. These seeds have been freely exchanged with other communities again across the world and have led to the development

* This Chapter is based on an article by Dr. Vandana Shiva and Tom crompton, published in the Economic & Political Weekly, 1998.

To increase soil fertility, we can take 10 kilos of cow dung and add 250gm of Ghee, stir for 4 hrs, to it add 500 gm of honey and 1 kg of jaggery then again stir for 4 hours. After that it becomes very good food for soil micro-organisms. To it add 200 liters of water. We call it Amrit pani/Sanjivini pani. Apply it to one acre of land. Then mulch it. Fourteen hundred farmers of Maharashtra, Goa are using this method to increase their wealth of earthworms in the soil. These earthworms guide other microorganism for supplying nutrient to the plants. A farmer Pandharpur in Maharashtra has a 23-acre vineyard, where he is using this method. His farm yielded grapes to a tune of 1 tonnes per acre, which is a record.

- Kunwarji Bhai Zadav,
All India Kisan Sabha

of new varieties. Today, with the entry of the multinational sector in seed production and supply as well as new technologies for producing seed, seed varieties have been given a variety of names depending on who evolved it, how it was evolved and its potential for making profits.

Farmers' varieties are those varieties which have been developed by farmers over the years to suit their ecological, nutritional, taste, medicinal, fodder, fuel, and other needs. These have sometimes been called landraces to distance them from the contributions that farmers have made towards their evolution through selection. They have also derogatorily been called primitive cultivars in contrast to elite cultivars as those evolved by scientists. Farmers' varieties like any other seed variety, are an embodiment of intellectual contribution. Farmers' varieties are perennial and sustainable. Farmers' varieties are also referred to as indigenous seeds, native seeds, organic seeds, heirloom seeds and heritage seeds, jwaari, nate, desi etc.

High yield varieties (HYVs), or green revolution seeds are misnamed because the term implies that the seeds are high yielding in and of themselves. The distinguishing feature of these seeds, however, is that they are highly responsive to certain key inputs such as fertiliser and irrigation. They are actually, **high response varieties.** Though these seeds can be saved by farmers, they are non-sustainable due to vulnerability to diseases and pests and therefore need to be replaced after one or two crops.

Hybrid seeds are the first generation seeds (F1) produced from crossing two genetically dissimilar parent species. The progeny of these seeds cannot economically be saved or replanted, as the next generations will give much lower yields.

Hybridisation is only one of the breeding techniques. It does provide high-yielding varieties, but so do other breeding techniques. It is thus like biological patenting the seed. No one else, neither the farmer nor a rival company, can produce exactly similar seeds unless they know the parent lines, which are the company's secrets. This characteristic of the hybrid seed has been fundamental to the rapid growth of the American Seed Industry. The corporate seed sector in India is also involved mainly in the development of hybrid seeds including seeds of maize, sorghum, vegetables, and foodgrains.

The hybrid seeds are also called "Sarkari" seeds as these seeds have initially been developed and distributed by the public sector in India.

Today there are three kinds of producers of seed:

a.) Farmer Seeds: the farmer has historically been the producer of perennial varieties, which could reproduce themselves eternally.

b.) Public Sector Seeds: Public sector research institutions have bred short term varieties for "high yield". These seeds could for some time be saved and used by the farmer, but their yield reduces after a few years.

c.) Private Sector Seeds: Private companies and Transnational corporations produce non-renewable and therefore non-sustainable seeds through hybrids and tissue culture, where the farmer has to return to the company for fresh seed, each time he has to sow.

The last is called biological patenting of seed. Patents give the owner of the seed the exclusive right to multiply, save, develop further varieties and sell seeds. Biological patenting effectively prevents the farmer from multiplying, saving and selling the seed.

> The main concern is that organic farming is being hijacked by corporations. The large multinational are growing crops that may be technically organic but ignore organic soil practices, farm labour justice, wild life management. The organic farmers had to put up a tough fight with multinational such as Monsanto who were planning to water down the efforts of organic farmers. The USDA considered a National Organic Legislation that would include genetically modified food, irradiated foods, and use of toxic sludge and that would be considered as bio-fertilisers. In protest, 300,000 farmers wrote letters to the agencies about it. We have to now a days go two ways; one is to defend ourselves and the other to take the movement forward.
>
> ***- Dave Henson,*** *organic farmer for 25 years and presently with Occidental Arts and Ecology Center, USA*

2. The Decline of the Public Sector

The shift from indigenous varieties of seeds to the Green Revolution (high yielding and hybrid) varieties also involved a shift from a farming system controlled by peasants to one controlled by agri-chemical and seed corporations, and international agricultural research centers. The shift also implied that from being a free resource reproduced on the farm, seeds were transformed into a costly input to be purchased. Countries had to take international loans to diffuse the new seeds, and farmers had to take credit from banks to use them. International agricultural centers supplied seeds, which were then reproduced, crossed and multiplied at the national level.

The National Seed Policy

The Royal Commission of Agriculture (est. in 1928) was the first body to recognise the necessity of the high quality seed. In seeking to promote the agriculture, Royal Commission placed emphasis on the production and distribution of the quality seed. The National Seed Corporation Ltd. (NSC) was founded in 1963 and was charged with the systematic production and distribution of seed. This action was followed by the passage of Central Seed Act, which provided the statutory support for quality control. The National Seed Review Team was constituted in 1967 to make recommendations to the National Commission on Agriculture. Among the recommendations were strengthing the power of NSC and to foster the creation of additional government organisations to produce and distribute seed, including the State Farm Corporation of India (SFCI), 13 State Seed Corporations (SSC's), 19 seed certification agencies and 26 seed testing laboratories. The passage of Central Seed Act, 1996 laid the legal foundation for present day seed industry. During the 1960s and the 1970s the participation of the private seed industry was minimal. The situation changed dramatically in mid 1980s, when the private seed industry experienced a sudden expansion; primarily by the appearance of the attractive market of hybrid sorghum and pearl millet. The specific policy reforms introduced in the 1987 further encouraged the growth of private seed industry. There was a subtle take over of the government control of the seed by the private companies. Firstly, many public breeding institutes began making

germplasm (e.g. inbred lines) more readily available to private companies. Secondly, industry licensing policy was modified to attract greater participation of Indian companies as well as companies with minority foreign ownership.

The so-called reform process further threw open in 1988 with the passing of the New Policy for Seed Development. This landmark legislation was the process of handing over the seed sovereignty of the country to the foreign participation. The New Policy for Seed Development permitted private companies to import seed of vegetables, flowers and ornamental plants, although the imported material was subjected to prior approval by the Indian Council of Agricultural Research (ICAR). Imports of the seed of coarse cereals, pulses and oilseeds were also permitted following the approval from ICAR. In the seed production and distribution the private companies are reluctant to deposit the seed to the government agencies on the pretext that these might fall in the hands of their competitors.

Policy reforms introduced in the 1980s and 1990s led to lowering of many legal barriers, which was characterised by the rapid growth in the number of companies. The MNCs by arriving with lucrative job offers and better working conditions have infact marginalised the public R&D centers of the country. The Public Sector Units (PSU) have very little of the talent as most of the professionals have gone to the other side. Although the research component still persists, but this drain has lead to the deterioration of the public breeding programme of the government.

Whilst the Green Revolution of the 1960s and '70s was orchestrated by the public sector, the so-called 'Second Green Revolution", based upon new hybrid and genetic technologies, will be driven by the private sector. Accompanying this shift is a change in motivation from one based upon the common interest (however misguided this may have proven to be in practice) to one based upon corporate profit. Who, under this new regime, will pursue research in the public interest where this does not concur precisely with corporate interest? In this section, the decline of the public sector seed industry will be charted. The next section will examine the rise of the private sector.

The Privatisation of the Public Sector

There are as yet no cases of transnational taking over public sector companies in the Indian seed industry (though there has been at least one attempt-see below). Under Structural Adjustment Programmes (SAPs), investment in the public sector, and therefore the competitiveness of this, has fallen. Its role has now diminished to:

- *Provision of open pollinated seed.* The majority of seed distributed by State Seed Corporations is open pollinated. The market for open pollinated seed is expected to decline as pressure to use hybrid seed increase. But at present, SSC sales of Open Pollinated Varieties (OPVs) do little to compete directly with private sector sales (predominantly of hybrid seed). Successful public sector pearl millet hybrids represent an exception, to this generation. However, the area planted under pearl millet (denigrated as a 'coarse cereal') is falling nationally (Ram, 1996).
- *Sale of hybrid seed in crops for which there is little private sector interest.*

Public sector bajra (pearl millet) hybrids are extolled as demonstrating the continued competitiveness of public sector research and development. However, the area of land planted under pearl millet is actually falling annually, as farmers turn to other, more commercial, crops.

- *Erosion of the public sector market share*. It is a professed aim of State Seed Corporations and Agriculture Departments to encourage the shift to increased use of hybrid seed; a market increasingly dominated by transnational companies (or national companies with tie-ups with foreign companies).
- *Production of parental lines*. Increasingly, the role of public sector research institutions is viewed as the production of parental lines to be given to private companies for further development.
- *Sale of private sector seed*. Seed from private sector companies, particularly maize and sunflower seed from transnational, comprises an important proportion of total seed distributed through some State Seed Corporations. This attracts Central and State Government subsidies, amounting to direct though unacknowledged, governmental support for the private sector.

The Structure of the Public Sector

The National Seeds Corporation

The National Seeds Corporation (NSC) was established in 1963, with the massive importation of new high yielding varieties. The NSC became the distribution arm of the public sector, responsible for the production and marketing of varieties bred at ICAR funded institutes and agricultural universities. Its role has since been largely superseded by the State Seed Corporations. However, it still grows seed, under contract to 7000 farmers, to compensate for shortfalls in seed production by the SSCs. The NSC is an important producer of vegetable seed, particularly open pollinated varieties of around 100 products, and about nine are hybrids. The director, Deepika Padda, claims that the NSC produces vegetable seed over an area of 900,000 hectares, by comparison to a total private sector production area of 1,500,000 hectares. Despite being (or perhaps because it is) such an important producer of vegetable seed, attempts were made by World Bank representatives to persuade the director of the NSC to cut back vegetable seed production. Whether or not the private sector can be entrusted with the pricing of vegetable seed in the absence of public sector competition is equivocal. Cabbage seed imported from Japan and sold by the National Seeds Corporations for Rs. 6000 per kilogram is sold by a private company for Rs. 12-15,000 per kilogram. Meanwhile, the NSC has maintained a workforce of around 600 (comparable to its strength in the 1960s), the private seed company is paying recent graduates Rs. 2,500 (or US $ 70) per month.

State Seed Corporations

Thirteen State Seed Corporations were established in 1975, under World Bank funding. These largely took over public sector seed production from the NSC. They still comprise a highly important sector of the Indian seed industry,

particularly with respect to open pollinated cereal varieties. The managing director of Andhra Pradesh SSC, for example, estimates that this provides some 75% of the seed requirements of the state; 40% of this seed is hybrid, much of it provided by the private sector.

The remainder of the seed supplied by the State Seed Corporation, in the case of Andhra Pradesh (AP), is produced by some 6000 share-holding "cultivating farmers". Nuclear seed, developed in the public sector-by ICRISAT, ICAR, and the Universities-is used in the production of breeder, foundation, and certified seed. This is then processed at one of eighteen processing units in the State, and supplied to farmers.

Some SSCs are financially profitable. The AP-SSC, for example returned an 8% dividend to shareholders last year. It seems however, that profitability is set to increase the threat from the private sector. This is not merely manifest as an encroachment upon the market share of SSCs. For example, John Hamilton, then managing director of Cargill, tried (with the support of World Bank representatives) to buy Karnataka SSC.

Research and Development

All private sector representatives concur that the competitiveness of public sector varieties and hybrids is falling. The managing director of IML Seeds estimates that 90% of maize, and virtually all sunflower seed now sold, are private sector hybrids (or varieties). Even State Seed Corporations are increasingly supplying private sector hybrids. Several contributory reasons are suggested for this:

1. The success of private-sector advertising campaigns.
2. Funding problems, both nationally, with higher education funding in crisis, and internationally (for example, withdrawal of international funding for ICRISAT in Hyderabad), leading to under investment in public sector research programs.
3. Public sector bureaucracy.
4. The failure of poorly trained SSC staff to properly maintain public sector lines, which are given to SSCs for perpetuation.

This has lead to a shift in the role of the public sector. Increasingly, public sector research establishments are seen as the providers of lines for further development and refinement by the private sector. These are made freely available to private sector breeders.

Paddy and wheat seed sales are still dominated by the public sector, although with increasing private sector interest in hybrid paddy, the public sector of sales of this seems set to diminish. Sales of public sector hybrids of pearl millet are also good, though (as mentioned above) there is comparatively little private sector competition for the market for hybrids of so-called 'coarse cereals', for which the area cropped nationally is falling annually.

Many smaller seed companies rely upon sales of public sector hybrids and varieties. Other new companies have used sales of these to maintain viability whilst developing their own hybrids. Examples are provided by J.K. Agri Genetics and IML Seeds, both of which entered the seed market in 1989, in

the wake of the New Seed Policy (1988). Initially, both companies relied upon sales of public-sector varieties and hybrids, before launching their own research and development programs. However, it is generally recognised that relying exclusively upon sales of public bred hybrids is difficult. Such hybrids are available to all small companies, and competition is stiff. Subsidies for public-sector suppliers of this same seed makes private sector involvement less attractive. Furthermore, and in response to the intensive advertising campaigns of large seed companies, farmers are moving increasingly toward use of proprietary hybrids. Many smaller seed companies will be hard-hit by the dual effects of the diminishing competitiveness of public-sector varieties and hybrids, and heavy investment in the expansion of the private sector market for proprietary hybrids.

World Bank Funding of the Public Sector

World Bank-funded National Seed Projects (NSP) were initiated in the mid-seventies, to make the Indian seed industry 'more viable and result-orientated'. That is, 'to create necessary infrastructural facilities for seed production, conditioning, storage and distribution of high quality seeds' (Chopra et al, 1995). Three such Projects (NSP I, NSP II, and NSP III) were undertaken (beginning in 1975, 1981 and 1988, respectively). The last of these three ran up until 1996. The proportion of funding for each Project offered to the private sector follows an trend representative of the shift in emphasis from public to private sector investment under Structural Adjustment Programs (Table 1.1).

In particular, World Bank policy changed in 1993, when it was concluded that investment in the public sector seed industry was unproductive. Subsequently, support was concentrated in the private sector. In the case of NSP III US $ 30 million credit was made available to private companies through the National Bank for Agricultural and Rural Development (NABARD) under favorable loan agreements. Specifically, these were made available for infrastructural improvements, germplasm import, agricultural education and seed testing (they did not cover working capital or land purchase). Recently, an FAO team recommended against a Fourth Project, concluding that the growth of the seed industry will continue without further intervention. (However, individual state governments are invited to submit applications for financial support for the private sector to the World Bank. Uttar Pradesh, where the private sector is 'under-developed', is thought to be pursuing such sources of funding).

TABLE 1.1
Proportion of World Bank funding for each successive National Seed Project earmarked for the private sector

National Seed Project	*Beginning (Year)*	*Apportioned to Private Sector (Approximate)*
NSP I	*1975*	-
NSP II	*1981*	*20-25%*
NSP III	*1988 (ran until 1996)*	*60%*

Source: *Personal communication by Tom Crompton with K.R. Chopra, World Bank Consultant, 1997*

3. The Privatisation of the Seed Sector

The Indian seed industry is undergoing a period of rapid change inaugurated by the economic liberalisation of the past decade including the New Seed

Policy of 1988. The structural adjustment programmes of the 1990's and the coming into force of the W.T.O. agreements on Trade Related Intellectual Property Rights (TRIPs), the New Seed Policy lifted restrictions on private sector import of foreign germplasm, enabling larger seed producers, particularly those with foreign collaborations, to access seeds from international sources. Increasingly, the public and private sectors are being delineated in terms of the type of seed they each produce. The public sector focuses on the development and production of open pollinated varieties (OPVs), which are less commercially exploitable than hybrid seeds. The private sector concentrates upon these latter and more remunerative crops (such as vegetables). This is a polarisation, which is set to continue, particularly as pressure on farmers to switch to use of high yielding hybrids intensifies. Despite this polarisation, both the public and private sectors are engaged in initiatives to increase hybrid seed usage amongst those farmers currently using open pollinated varieties.

Predictions suggest that the Indian seed industry will be worth some 20 billion rupees (around US $600 million) annually by the turn of the century. Indeed, the former managing director of Monsanto, S. D. Khanna estimates that it will be worth 60 billion rupees (around US $ 2 billion). As the commercial value of seed sales grows, the proportion of these accounted for by the public sector is diminishing, with more farmers turning to high yielding hybrid seeds produced by private seed companies. Simultaneously, there will be a continued coalescence of the industry around a few key companies, most of which will either be subsidiaries of transnational companies, or otherwise have entered joint agreements with such companies. Representatives of large seed companies (and in some instances the directors of smaller companies) admit that the future for low-turnover domestic seed enterprises looks grim.

There is uncertainty over the actual current value of the seed industry, though it is anticipated that this stands at 12,000-16,000 million rupees per annum. Estimates placed the value of the industry (both public and private) at 10,000 million rupees back in 1994. According to one such estimate, the value of seed sales broke down by market sector as detailed in Table 1.2.

This massive and continued growth is attributed to a shift in seed sales away from the public sector and towards the private sector, commensurate with an increasing demand for high-yielding hybrid seed. As K.R. Chopra (managing director of Mahendra Seeds, president of the Seed Association of India, and consultant of the World Bank) writes: "The commercial exploitation of hybrid vigor in recent years has been a crucial factor in phenomenal increase of private sector contribution to the total turnover" (Chopra et al, 1995). The managing director of Mahyco, Mr. R. Barwale, estimates that the distribution of the market has shifted since 1994 (see Table 1.2). He suggests that currently some 30% are attributable to the public sector (state seed companies), 40% to 'large' private companies, and 30% to 'small' seed companies. If he is correct, this represents a small shift away from the public sector, and a significant shift within the private sector in favor of large companies

TABLE 1.2
Estimated Value of Various Sectors of Seed Industry, as of 1994 Figures

(in Million Rupees)

Public Sector	4000
Private Sector	6000
Organised	3500
Large	2150
Small	1350
Unorganised	2500
Total	**10000**

Source: *Data complied by Mallick (1995). The operational definitions of 'large' and 'organised' are not clear.*

over the last three years. However, these figures are essentially speculative, and Barwale was unclear how he defined a 'large' (or 'small') company.

Table 1.3 shows one projection for a breakdown of the growth of the seed industry, by crop type.

Estimates of the proportion of the market accounted for by hybrid seed sales (in terms of value, rather than volume) also vary, but the suggestion by Mr. S.U. Baig (Director, Nath Seeds) that this stands at 70-75 % represents a consensus viewpoint. Baig also estimates that 25% of the market is held by 15 or 16 companies (perhaps 10% of all companies nationally). Indeed S.D. Khanna, the former manager of Monsanto suggests that there are only 15-20 'sustainable' seed companies in the country. Khanna goes further, suggesting that suppliers within the public-sector have 'only survived this long due to ignorance of farmers''.

TABLE 1.3

Breakdown of the growth of the seed industry

Crop	*1994*	*1997*	*2002*
Paddy	200	275	350
Wheat	220	325	450
Sorghum	75	90	115
Maize	65	70	90
Pearl millet	35	44	60
Sunflower	10	14	20
Mustard	8	12	15
Others	87	170	400
Volume	700	1000	1500
Value (Rs million)	**10,000**	**15,000**	**30,000**

Source: *Kapoor and Sindhu, 1995.*

Note: Seed Industry growth projections (thousand tonnes). The bottom row also shows total projected sales of seed, in both public and private sectors.

The reduction in the public sector market share is difficult to document, for two reasons. Firstly, the seed production of State Seed Corporations, the main public sector suppliers of seed, continue to grow. What is not clear is whether this is growing in proportion to the expansion of the overall market. Secondly, State Seed Corporations themselves buy seed from the private sector (Andhra Pradesh State Seed Corporation, for example, buys some 25% of its seed from the private sector). This means that an appreciable proportion of seed sales by this Corporation are, in actual fact, attributable to the private sector.

Expectations for the expansion of the seed market are derived from two considerations. The first is based upon estimates that at present a high proportion of seed is saved by farmers from year to year. This may be seed saved from commercially bought open pollinated varieties, or even second generation (F2) hybrid seed. In addition, a significant proportion of this seed is taken from local 'landraces'. It is anticipated that farmers will increasingly buy new seed each year, and where they are using landraces, will turn to alternative commercial varieties and hybrids. The second consideration is that farmers are expected to increasingly turn to more expensive hybrid seed in preference to open pollinated varieties. Each of these factors will be considered further.

Farmer Saved Seed

Estimates of the ratio of farmers who replant saved seed each year vary. The managing director of IML Seeds, Mr. J.V. Laxman Rao, estimates that nationally in 1990 around 10% of farmers bought new seed annually, rising to 25% in 1997. He claims that this is now set to increase 5-6% per annum. Mr. Agrawal, the general manager of ProAgro-PGS, estimates that overall use of 'quality seed'

is 9.5% (Agrawal, 1996). The eighth five-year plan (1991-96) set a target of a 6% seed replacement ratio. The target for the ninth five-year plan (running to 2001) is 8%. Most farmer saved seed is OP or local landrace. Open pollinated (OP) seed performs well for four to five generations, with minimal selection of plants each year. In addition, some hybrid seed is planted in the second or third generation (F2 and F3). Second generation maize seed for example, is used in preference to new OP seed, according to the managing director of IML.

Table 1.4 shows the amount of seed supplied by the industry for each of six crops, in 1994. Also shown is the estimated percentage that this represents of the total seed planted. This is calculated on the basis of average seed requirements per unit area of a particular crop. As might be anticipated, relatively little seed is bought for crops which are predominantly open pollinated (paddy and wheat). Other crops where hybrid seed is available, show higher proportions of supplied seed. In fact, the proportion of sunflower seed that is taken from suppliers is now probably far higher (estimates suggest that around 95% of sunflower seed planted is hybrid, and most of this will be re-bought annually).

TABLE 1.4

Seed supplied (in tonnes) by the seed industry in 1994, for a range of crops, and estimates of the proportion

Crop	*Seed supplied (tonnes)*	*Seed supplied as percentage of seed planted (calculated on basis of total area under crop)*
Paddy	150,000	11.7%
Wheat	200,000	8.3%
Sorghum	45,000	25.9%
Maize	35,000	29.4%
Pearl millet	30,000	71.8%
Sunflower	7,000	43.0%

Source: *Chopra et al, 1995.*

The Agricultural Commissioner for Andhra Pradesh estimates that between 10% and 30% of cereal seed planted in the state annually is of local landrace varieties. In particular, use of landraces is concentrated in:

- areas of newly-cultivated land, which tend to be farmed by novice farmers unclear of the vaunted advantages of use of commercial seed
- areas where water shortage makes investment in commercial seed less attractive
- areas where credit for purchase of commercial seed, fertilisers and pesticides is difficult to secure
- areas where local landraces are preferred due local taste preference.

The Shift Towards Hybrids

At the National Conference on Seeds, Agra (in 1993), targets were set for annual increases in the hybrid seed production (expressed as mass of seed) up until 1997 (see Table 1.5).

K.R. Chopra estimates that total hybrids use has increased from 8% (1994) to an estimated 25% (1997) of seed annually planted. The director of Nath seeds estimates current hybrid seed use as shown in Table 1.6.

Factors contributing to this remarkable increase in hybrid seed use will be considered in some detail. Chopra identifies two such factors; 1) the development (by the private sector) of short-maturing hybrids; and 2) the hiking

of grain prices, making heavy investment in hybrid seed commercially viable for those farmers who can afford it. Note the maintenance of these grain prices is determined in part by seed suppliers (Cargill, for example, who are able to manipulate maize prices, also sell hybrid seed for planting). To these two further factors might be added; 3) an intensive advertising campaign conducted by seed companies, and augmented by government-funded projects to increase farmer's acceptance of hybrid seed and; 4) according to some industry representatives, the effects of farmer-to-farmer advocacy of hybrid use. The marketing manager of Cargill, for example adopts a strategy encouraging farmers themselves to become "Cargill spokespeople".

The hybrid seed market is reputedly, highly fickle; farmer's preferences for particular brands of seed change rapidly, reflecting in part the specific marketing success of individual companies, and favoring those with a broad product portfolio. This viewpoint is corroborated by the manager of one small seed retail company, who claims that in his experience it takes just two years for farmers to switch allegiances to a new HYV or hybrid. This frequently follows heavy promotion of particular brands. He cites, for example, the case of a Western Agri cotton hybrid which was heavily promoted through the distribution of free 50gm seed packets to selected high-performing farmers, and provision for an attractive profit margin for seed retailers (see Table 1.10). However, the (possibly fortuitous) suitability of a particular hybrid to growing conditions one year will boost sales of this same hybrid the following year, to the detriment of sales of alternative seed. An example is provided by the public sector cotton hybrid NHH44, which was particularly successful in 1996 (perhaps as a result of its suitability to good rains). Future sales of the hybrid are expected to be colossal, although if the rains are poor, yields may be low, and farmer's allegiance will switch in the following year.

TABLE 1.5
Yearwise hybrid seed production plan (1992-3 to 1996-7)

Crop	*Annual growth rate (%)*
Maize	17
Sorghum	6
Pearl millet	22
Sunflower	63
Castor	14

Source: *Chopra et al (1995)/. 'Annual Growth Rate' refers to annual targeted proportional increase in hybrid seed sales.*

Notes: Yearwise hybrid seed production plan (1992-3 to 1996-7), according to National Conference on. Seeds, Agra 1993.

TABLE 1.6
Current estimates of hybrid seed sown as a proportion of the total *seed of the corresponding crop planted each year*

Crop	*Hybrid Seed Planted as a Proportion of the Total*
Cotton	23%
Sorghum (kharif)	95%
Pearl millet	50%
Maize	75%

Source: *S.U. Baig, Director, Nath Seeds, (1997)*

Public Sector Campaigns

Subsidised Seed

The State Seed Corporations (SSC) have two stated aims, summarised in the strategy document produced by Andhra Pradesh SSC. The first is to provide 'high quality seed to farmers at reasonable prices, the second is to 'coordinate with the Department of Agriculture, Government of Andhra Pradesh, in accelerating the spread of hybrid/high yielding varieties of different crops for promoting increased agricultural production'. This latter aim is addressed through both the provision of seed at subsidy, and the supply of private

sector produced seed. In fact, as discussed earlier, 25% of the seed supplied by AP-SSC is bought from the private sector (mainly maize and sunflower-crops dominated by multinational companies). This is an evident source of embarrassment for R.S. Paroda, Director General of the Indian Council of Agricultural Research (ICAR). He points out that the policy of individual SSCs is beyond the control of Central Government, and claims that instances of these buying seed from the private sector are exceptional.

Farmer's Seminars

During the kharif season, 1997, the Government of Andhra Pradesh organised a series of Statewide *Karshaka Sadassus*, or farmer's seminars. These comprised a two-day exhibition of agricultural technologies, and a programme of seminars extolling the applications of these. It was anticipated that around 30,000 farmers, representing all neighboring villages, would attend each of the 22 Karshaka Sadassus. In addition, the participation of private seed companies was invited, to 'exhibit agri-inputs and other related products'. The seminars, it was claimed, offered 'a good opportunity for exposing the latest technology in agriculture, and inputs available to farmers'.

State Agricultural Training

In Andhra Pradesh, the State Agriculture Commission has set up a network of Farmer's Training Centres, with one to each district. These organise training, both at the Centre, and through two-day training sessions in villages, for groups of 25 or so farmers. In addition, each district has several development and agriculture officers.

The Intensive Tribal Development Agency (ITDA)

In Andhra Pradesh, the State Seed Corporation supplies seed to two regional Intensive Tribal Development Agencies (based at Paderu and Utnoor), for distribution amongst tribal peoples, at large subsidies. The managing director of the AP-SSDC predicts that within 2-3 years, all residual use of local landraces by tribals will be eradicated.

In Utnoor District (350,000 people, around 80,000 families) soya-bean seed, black, green and red gram, paddy, cotton and sorghum (jowar) seed is supplied at a subsidy. Some of these represent new commercial crops for tribals (soya bean, for example). Others (jowar) are already grown as important landraces. Under a scheme that was initiated in early 90's, seed was initially supplied at a 75% subsidy. This has since been cut to a current 50% subsidy (25% subsidy is provided by the Andhra Pradesh Department of Agriculture, with the ITDA meeting the remainder). Under the scheme, fertilisers and pesticides are also provided at a subsidy, with the government providing subsidies on fertilisers, and the ITDA a 50% subsidy on biopesticides.

Only around 20% of families can be supplied with subsidised seed. These are selected at a local level by the Village Tribal Development Association. Although the ITDA hopes to do away with the subsidy in the near future, the Project Officer admits that amongst those to whom subsidised seed is no longer made available, very few are continuing to plant hybrid seed. This is attributed to the difficulty encountered by tribals in securing loans. In the past, tribals

have been forced to default on bank loans following crop failure (HYVs and hybrids are particularly vulnerable to this as a result of the more stringent growing conditions).

The Project Officer also concedes that there has been an increase in patriarchal power following a shift toward planting of commercial crops. This follows a reduction in the importance of the role of women in harvesting these crops. In an attempt to redress the balance, grant aid is simultaneously being given to women's projects, to encourage alternative enterprises (cattle breeding, or small market-based projects, for example).

Private Sector Campaigns

The private sector is predominantly concerned with conversion of farmers currently relying upon open pollinated varieties to use of hybrids. Except in the case of sunflower, where most seed planted is hybrid (estimates are that the proportion is as high as 95%), the potential for expansion of the hybrid market is seen as large. Mr. J.S. Bindra president of Shriram Bioseed Genetics, for example, summarises the attitudes of many industry representatives when he comments: "Only after farmers currently dependent upon OPVs switch to hybrids, can we foresee the development of commercial interest in farmers still relying upon landraces".

This emphasis upon market expansion means that many companies profess to concentrate upon a development of the market per se, rather than pushing their own particular hybrid brand Multinational seed companies invest most extravagantly in the development of the hybrid seed market. Cargill, for example, organise a series of 'field-days' and demonstration plots. The company has a team of 'field assistants' which have the sole job of visiting farmers and 'cold-selling'. Strategies also include mail-shots and newspaper advertisements. The marketing manager claims that the key to their sales strategy is a 'farmer advocacy' -encouraging farmer themselves to advocate Cargill seed.

Field - Days

Farmers are invited to the field of another farmer exhibiting uncommonly high yields of branded seed. These exemplary farmers may be singled out before the growing season, on the basis of their competence in previous seasons, and asked to grow the relevant branded seed. Alternatively, exemplary crops may be chosen at the end of each growing season from amongst a company's customers. Cargill adopts the latter approach, choosing around ten exemplary fields in Karnataka alone, and inviting between 200 and 300 farmers to each. Those farmers invited are not, by and large Cargill customers. ITC Zeneca adopts the alternative approach: Selected farmers are given ITC Zeneca seed to plant, alongside local varieties. At harvest time, up to 500 neighboring farmers are invited to a 'farm-day'. Here the farmer relates his experience of growing the seed to other farmers, and Zeneca technical staff are on hand to back him up.

Cargill augment field-days with 'Intensive Customer Contract Programme's (ICCPs), where Cargill staff gather together a group of farmers, and 'sit under a tree with a folio chart, to talk to them'. By the end of their first season of sales, Cargill staff had held perhaps 3000 such sessions, each attended by 20 or 30 farmers.

Sales Men

Although all Cargill seed is distributed through Rallies, the company has an extensive marketing network of its own. Each member of a seven person marketing team employs a further 10-15 temporary staff. These temporary staff are taken from farming communities local to those in which they will work. Cargill's marketing manager claims that this means sales staff appear 'more credible'.

Media

ITC Zeneca have a touring cinema which shows a short film dramatising inter-village competition for the annual trophy for the best crop. The consistent victory of one village is attributed to its use of Zeneca seed. Following adoption of the same seed by the neighboring village, both become equally successful, and the rival villagers are reconciled under the slogan 'with ITC Zeneca, it's a win-win situation'.

Cargill view their Krishi Kaipidi (or 'Farmer's Handbook") as a public-relations tool. This is published in fortnightly installments in local newspapers during the growing season, and offers farmers practical advice on maximising the yields they obtain with their hybrid seed.

In engineering their dramatic (though self-proclaimed) rise to prominence as suppliers of maize seed in the north, Kanchan Ganga sold seed at a loss for the last two years, or so in order to establish a market. Cargill also may provide small packets of free seed to farmers, particularly poor farmers in areas where use of open pollinated varieties predominates. Cargill's marketing manager claims that free seed is not used as a strategy for converting farmers from rival brands of hybrid seed to Cargill seed.

Free packets of hybrid seed may also be enclosed with larger packs of open pollinated seed. Arora (1995) claims that 'there have been instances' where the additional yields obtained with the hybrid seed have justified a complete switch to this the following season.

4. Big Companies Getting Bigger

Tiwari (1996) estimates a total of 147 private sector seed companies, which can be broadly categorised according to whether they (1) develop, produce and market their own varieties and hybrids, (2) produce and market public sector varieties and hybrids, or (3) have no production capacity whatsoever, concentrating solely upon marketing. Agrawal (1996) estimated that of the former category, 24 companies have entered collaboration with foreign companies. In addition several multinational companies have opened subsidiaries in India.

There are several recent and discrete legislative changes which have promoted the growth of the private sector, Agrawal (1996) identifies these as:

1986 - Provision of private seed companies with breeder seed for public sector developed self-pollinated crop varieties

1988 - New Seed Policy, liberalising seed imports and encouraging foreign investment in the seed sector

1991 - Relaxation of limitations on foreign equity participation, permitting foreign companies to hold controlling stakes in industrial enterprises.

The Market Niche of MNCs

Multinational companies dominate in crops where access to international germplasm, places them at an advantage over national companies. In particular, these are maize, Sudan-grass/sorghum hybrid (SSG), sunflower and soya. Rather than developing new hybrids specifically for use in India, multinational companies have tended to focus upon the exhaustive testing of extant hybrids imported from other countries, for suitability to Indian conditions. For example, Cargill maize and sunflower hybrids (which are 'price leader's, reflecting, it is claimed, their superior quality) were imported from international sources. Of the four biggest suppliers of sunflower seed, three (ITC Zeneca, ProAgro and Cargill) are multinational, reflecting the origin of all sunflower germplasm in the US.

Now, however, multinational companies are beginning to move into crops which have been dominated hitherto by domestic companies. Cargill, for example, are poised to push sales of sorghum hybrids.

Multinational companies have a characteristic sales strategy, typified by Cargill, preferring to emphasis 'quality' and consumer confidence, rather than competitive pricing. Thus Cargill's hybrid sunflower seeds retails for Rs. 350 per kilogram, over three times the price of hybrid sunflower seed produced by a local company, Bhavani Seeds (see Table 1.7). Cargill justify this price on the basis of higher yield, consumer confidence, and after-sales back up. Besides, it is claimed, only 3-5% of a farmer's total outlay cost is expended on seed. (Cargill claim that a progressive farmer spends perhaps 8% of his cost of production on hybrid seed, but can achieve a 50% yield advantage). The local seed company concedes that the yields obtained using Cargill seed exceed those obtained with its own proprietary hybrid. However, they suggest that the yield gains alone do not justify the vastly inflated prices. The production manager suggests that typical yields obtained with Cargill sunflower seed would be 12-13 quintals per hectare, as compared to 10 quintals per hectare using Bhavani Seed's own hybrid. Cargill sales, he suggests, are maintained only through massive advertising campaigns with which smaller companies cannot hope to compete.

TABLE 1.7

Cost of contract seed production, and retail prices, for three classes of sunflower seed (1997-98)

	Buys from Contract Grower (Rs/quintal)	***Retails to Customer (Rs/quintal)***
Bhavani Seeds sunflower variety	20	40
Bhavani Seeds sunflower hybrid	40-45	140
Cargill sunflower hybrid	140	350

Source : *Figures quoted by production manager of Bhavani Seeds.*

Case-Studies of Specific Markets

The Maize Market

The maize market is growing rapidly, and is expected to continue to grow as the processed food market expands under liberalisation. Calculated upon the

basis of the total area nationally under maize, the potential seed market is reckoned to be some 120,000 tonnes. With Cargill (the price leader) selling maize seed for over US$ per kilogram, the maize market alone is viewed as being worth a potential US $ 120 million. Note that Cargill, the largest supplier of maize seed to the Indian market, also has some control over global grain prices, and hence the relative economic benefits to the farmer of investing in expensive hybrid seed. Cargill are attempting to force up the price of maize seed: The marketing manager is rueful that his company sells the seed at three times the Indian price in Pakistan (US $ 3.50 per kg). He attributes this price differential to the lower domestic production of maize seed in Pakistan. Of course, diminishing domestic production of seed by domestic Indian companies will inevitably follow the consolidation of the multinational market share. The price of maize seed is, it seems, set to increase.

TABLE 1.8

Trends in areas of maize planted, and amount of certified seed distributed, for the first half of the decade

Year	*Area of maize plante (million hectares)*	*Certified seed distributed (tonnes)*
1990-1	5.90	14,900
1991-2	5.86	15,000
1992-3	5.96	15,000
1993-4	6.00	12,900
1994-5	6.11	13,700

Source: *Ram, 1996.*

Note that whilst the area of maize planted has increased, on aggregate, over this period, the amount of certified seed supplied has fallen. This suggests a shift away from certified seed, towards private sector seed use.

It is clear that the area planted under maize is increasing annually, whilst sales of certified seed is falling (Ram, 1996) (see Table 1.8). If we assume that the proportion of farmer's saved seed is also falling from year to year, it is evident that an increasing fraction of maize seed planted, though bought commercially, is not certified. This in turn suggests a shift from public sector (generally certified) to private sector (usually uncertified) seed usage.

The director of Pioneer Dr. G Bhatia, estimates that around 90% of the maize market is in the private sector. Some estimates suggest that currently, 25% of maize seed planted annually is hybrid (25-30,000 tonnes of seed), around 60% of open pollinated variety, and 15% landrace. However, it is considered difficult to differentiate clearly between the OP and landrace share of the market. Landraces are used particularly in the north of India, in the Indo-Gangetic belt. Here cropping patterns demand a short-maturing maize. Whereas local landrace mature in 60-70 days, the quickest maturing hybrid requires 85-90 days. Although yields may be lower, maize is grown principally for domestic (as opposed to commercial) use; maturation time is prioritised over yield. The marketing manager of Cargill estimates that over half the country's maize is grown in the north, with landraces accounting for perhaps two thirds of this (note an inconsistency here with the estimate that 15% of maize planted nationally is landrace). By comparison, in the south maize is grown as a commercial crop and hybrids predominate in Karnataka, for example, it is estimates that 70-80% of maize is hybrid.

Initiatives are being taken by seed companies to develop the market for hybrid maize in the north. Ultimately, it is believed that the full market potential will be realised only when short-maturing, high-yielding hybrids become available. Kanchan Ganga Seeds claim to have developed such a hybrid, which has seen their maize seed sales leap from 5 tonnes in 1995 to 1,300 tonnes in the first half alone of 1997. Such examples of the direct targeting of hybrid seed at farmers who currently rely upon landraces is uncommon, at least at

present. However, in this instance, many of the farmers sowing local landrace varieties of maize are simultaneously using proprietary hybrid seed in other crops.

The alternative approach is to encourage the planting of maize as a commercial crop in the north. Cargill have entered an agreement with Anil Starch, which has a production unit in Ahmedabad requiring large quantities of maize. Under the agreement, Anil guaranteed to buy Cargill maize from nearby Rajasthan farmers, dramatically boosting Cargill sales in the State.

The Sorghum Market

It is estimated that the total area under sorghum is in the region of 12 million hectares, of which approximately 3.5 million hectares is under (accounting for annual hybrid seed sales of around 25,000 tones). Most of the remaining 8.5 million hectares is thought to be under landraces, with sales of OP sorghum low. There are two important sorghum seasons, kharif (autumn) and rabi (spring). 95% of sorghum seed planted in the kharif season is hybrid. This is used principally for fodder. The rabi crop is planted for domestic use (human consumption) and relies upon local landraces, which are tastier, and which are more resistant to the shoot fly than proprietary plants.

Hitherto, private companies have had difficulty entering the sorghum market, particularly for the rabi planting. This is for several reasons :

1. The yield benefits of hybrids over open pollinated varieties are low;
2. Sorghum flour is used for making rotis, and farmer's preferences lie firmly with the taste of local varieties;
3. Public-sector seed is good and of course, cheaper.

However, there is increasing commercial interest in rain-fed crops, like sorghum and pearl millet. Hitherto, these have been relatively neglected by the private sector, because research was easier on irrigated crops, and gains in yield higher. The business manager of Hindustan Lever foresees imminent replacement of rained landraces in remote and tribal areas with hybrids, and Nath Seed has recently introduced a hybrid sorghum, targeting the rabi market. This has a high grain and fodder quality, resistance to shoot fly, and a claimed (though seemingly improbable) four-fold advantage in terms of yield. The hybrid is derived from local landraces, which Nath Seeds found no difficulty in securing. (Even had this presented problems under farmer's increasing awareness of the commercial exploitation of landraces by seed producers, similar germplasm could have been freely obtained from the ICRISAT germplasm bank). Mahyco, too, have developed sorghum for the rabi season, claiming a more modest yield advantage of 25% and Cargill have also launched sorghum hybrids. Although farmers are known still to prefer the taste of their own varieties, Cargill hope that they can develop a commercial market in hybrid seed. They envisage farmers planting two discrete sorghum crops, one (of the local landrace) for domestic use, and one hybrid crop for sale.

Despite this increasing interest in rain-fed crops, hybrid coarse cereals are sold mainly in assured rainfall areas. In areas where rainfall cannot be assured, farmers are reluctant to invest heavily in expensive seed and the additional

inputs required for cultivation of hybrids. Company representatives recognise the market potential for low-input intensive hybrids in areas where rainfall is not assured, but cannot foresee the development of this in the near future.

The Vegetable Market

The market in seed of temperate vegetables far pre-dates the green revolution. However, the first hybrid vegetable seeds were introduced much later than cereals, with the release by Indo-American (which, despite its name, is wholly an Indian company) of tomato and capsicum hybrids in the mid 70's. Hybrids purportedly extend the possible cropping season, offer improved disease resistance, uniformity of size, and improved transportability. Table 1.9 lists estimated proportions of hybrid vegetable in total cropped area for the year 1993-4. These national figures obscure more dramatic adoption of hybrid seed in some state. Dr. R.S. Arora, the managing director of Century seeds, writes that "there has been 100% replacement of open-pollinated varieties with hybrids in major parts of Karnataka, Tamil Nadu, Maharashstra and West Bengal (Arora, 1995).

TABLE 1.9
Estimated proportions of hybrid vegetable in total cropped area for the year 1993-4

Crop	*Proportion of hybrids*
Brinjal	4.03
Cabbage	21.14
Cauliflower	0.59
Chilies	0.45
Gourds	1.18
Melons	2.10
Okra	0.77
Tomato	24.22

Source: *Arora, 1995.*

According to Arora, public sector institutions have been handicapped by poor seed distribution networks, and have tended to focus upon lower value crops like okra and peas. He claims that 'their [the public sector's] mindset is still not tuned to the high risk involved in demand/supply uncertainties and sudden varietal obsolescence. While public bred hybrids, barring a few, have not been able to get into the farmer's fields, private hybrids are spreading at a much faster pace' (Arora, 1995).

Opportunities for multinational companies in the Indian vegetable seed market are different from those in cereals. In the case of the latter, foreign companies can rely upon selling hybrids developed elsewhere, but found to be appropriate to the Indian market (take Cargill, for example, which spent two years checking existing hybrids for suitability to the Indian climate and market). In the case of vegetable seed production, however, greater adaptation of extant hybrids is needed in order to tap the Indian market. In practice, this means that multinational companies (like Peto and SVS Seminis) is then relied upon as the basis for development of hybrid suited to the Indian market.

Response of National Seed Companies to MNCs

Representatives of large Indian seed companies (for example, Nath, Mahendra, Mahyco, Indo-American) identify several areas where competition from multinational companies will not greatly impinge on their own market shares. Firstly, in the case of cereals, they do not foresee serious competition from MNCs in the sale of sorghum or pearl millet, for which access to international sources of germplasm is of little value. (Note, however, that MNCs are poised to move into the sorghum market-see previous section). Secondly, it is felt that, even where the hybrids offered by multinational companies are accepted as good

(principally, maize and sunflower) these companies simply do not have the marketing base, production infrastructure or distribution system to capitalise upon this. These sanguine expectations may be ill founded, or simply affected. K.R. Chopra, the managing director of Mahendra seeds reports with a note of optimism that multinational companies 'only' have half the maize market. He goes on to say 'the widespread fears of the effects upon domestic companies of the Seeds Policy of 1988 and the opportunities this has opened up for multinational companies have proven ill-founded'. But with half of maize seed sales, according to his own estimates, going to multinational companies, can he really be so complacent?

Dr. M. Attavar, president of Indo-American Hybrid Seeds is more candid in his criticism of multinational companies. He has seen the market share of Indo-American seeds decline since 1988, and is bitter about the aggressive marketing policies of multinational companies, 'with the investment potential to support low pricing'. (Note, however, that this is not an avowed marketing strategy of most MNCs, which tend to be price leaders). To his chagrin, Indo-American Seeds has also lost key staff to multinational companies. Attavar's response has been to look for tie-ups with foreign companies. Seminis Seed, for example, is produced and sold by Indo-American, and capsicum seed grown and exported for Peto. Indo-American has recently completed a huge capsicum seed production facility at Bangalore. This comprises one hundred greenhouses, each 40 meters by 10 metres, with a total capacity of 18kg of seed per greenhouse. In a celebration of a showcase of Indian industry, the site was opened by then Prime Minister, Deve Gowda, for whose visit, the road up to the site was tarmaced. There is some irony to the fact that the unit is in fact used for the contractual production and export of capsicum seed for a large multinational.

Indo-American is not the only large Indian private seed company to have seen its market share eroded following multinational competition. Mahyco, for example, enjoyed an 85% share of the market for sunflower seed in 1988. Today, their share (of an albeit expanding market) has fallen to just 10%. This is attributed by multinational company representatives to poor genetic practice, and careless seed production.

It seems clear that, at least for the immediate future, the size of the Indian seed market is set to increase dramatically. Whilst this growth is sustained, direct competition between seed companies may be averted. Whilst the plateauing of the market, it is generally accepted that competition between companies will intensify. K.R. Chopra (who says he has already seen off attempts to buy Mahendra Seeds by both Cargill and Monsanto) foresees more mergers and takeovers, particularly in the wake of the increased competition that will accompany market saturation.

Small companies

The managing directors of several small Indian seed companies are evidently very concerned to form collaborative links with foreign companies. One, having solicited a member of Research Team to look for potential UK collaborators, remarked melodramatically 'we must join hands with them [foreign companies] or die'. Whilst this director had tried out fifty or more

varieties of foreign seed, in the hope of interesting companies with successful hybrids in a joint venture, none took him up. Despite his own difficulty in finding a foreign collaborator, he foresees increased collaboration between smaller Indian seed companies and MNCs, 'after companies like Mahyco and ProAgro have all been taken'. Smaller companies will, he feels, fulfill a role in the distribution of new varieties, and possibly in the provision of Indian germplasm. Furthermore, smaller companies (and certainly Indian companies generally) are allegedly more aware of the importance of appeasing middlemen in the distribution chain. In some instances, seed passes through three such middlemen between producer and customer (a distributor, a dealer, and a retailer). Whereas multinational of Bejo Sheetal, claims that it is these middlemen who really establish sales. Consequently, it is important, he claims, to provide these with appreciable margins. The director of Nath Seeds also recognises the importance of the role of dealers, claiming 'farmers blindly follow dealers'.

In addition, some foresee a continued market for cheaper open-pollinated seed varieties. Those poorer farmers who cannot afford hybrid seed, or higher input levels, and are vulnerable to increases in the prices of fertilisers and pesticides, are seen to present a secure market for small domestic companies. It is also claimed that these farmers are becoming increasingly aware of the accumulative and deleterious effects of saving seed from open pollinated varieties from year-to-year. (Contamination from neighboring crops leads, it is suggested, to a diminution in yield). Such farmers are therefore increasingly rebuying open pollinated seed on an annual basis.

Small companies also derive sanguine hope from their conviction that open-pollinated varieties have a longer projected marketable life expectancy. Hybrid varieties derived principally from Western germplasm are, it is claimed by representatives of companies specialising in open pollinated varieties, more susceptible to pests and disease. Indeed, most company representatives admit that hybrid seed has a commercial longevity of around just five years.

Hybrid seed use represents a higher risk, which many farmers are not prepared to take. Note however, that some MNC representatives specifically identify poorer farmers with smaller holdings as being those who could benefit most clearly from a switch to hybrid seed. Such a shift would, they claim, maximise the yields, and therefore profits, of smaller holdings. That many poorer farmers have not switched to hybrids is attributed, they claim, to a caution born of ignorance, and to the difficulty experienced by small farmers in securing bank-loans. In the case of tomato for example, hybrid seed may be ten times more expensive than open pollinated seed (in terms of price per seeded acre). So, for example, open pollinated tomato seed sells for perhaps Rs.300 per kilogram (sowing between 500 grams and one kilogram per acre). Hybrid seed sells for up to Rs. 50,000 per kilogram (sowing perhaps 40 grams per acre).

One alternative role for smaller seed companies is the contractual production of seed for larger companies (Sandoz, for example, contracts out seed production to smaller domestic companies). Unicorn Agrotech Ltd is one such seed producer. This company concentrates mainly upon the production of seed for foreign companies, under contract. The managing director claims

that there are perhaps five other similar companies which focus upon contract seed production, and there are still others which would like to move into this area. The vice-president of Bhavani Seeds, for example, is also looking for a foreign collaborator. He foresaw a dual role in such a collaboration. Firstly Bhavani Seeds would produce seed for foreign companies, under contract, and for export. Secondly, he envisaged that foreign companies could sell their own hybrids through Bhavani Seeds marketing base. However, it is evident that smaller seed companies are indeed caught between pillar and post. Whilst Bhavani Seeds looks for opportunities to move toward contract seed production for foreign companies. Unicorn Agrotech is trying to move away from contract growing, toward production of its own hybrids. Under relaxation of the restrictions on investment of foreign companies in India in 1991, two foreign customers of Unicorn Agrotech Ltd have set up their own subsidiaries for seed production. Unicorn is feeling that its market is threatened, and has responded by increasing investment in development of its own hybrid varieties for sale on the domestic market.

Some small companies allude to difficulties they experience in producing sufficient seed to meet supply. Bhavani Seeds, based in Bangalore, for example, contract production of their hybrid sunflower seeds out to local farmers. Bhavani retail their seed for around Rs.140 per kilogram (by comparison to Cargill's retail price of Rs.350). Thus whereas Cargill are able to pay their seed producers Rs.60 per kilogram, Bhavani Seeds offer only Rs 40-45. Bhavani allege that this means they have difficulty finding local growers, and have had to contract their seed production out to farmers in the interior). As a result, Bhavani Seeds claims that it is unable to meet demand for its hybrid sunflower seed.

Representatives of smaller seed companies recognise that they are squeezed, increasingly, between a reliance upon a diminishing market amongst poorer farmers for open-pollinated varieties, and direct competition with multinational companies. Representatives of multinational companies are well aware of the effects of their increasing market share upon smaller domestic companies. The managing director of ITC Zeneca foresees that as farmers increasingly turn to more expensive seed, 'a shake out will happen', with many smaller companies going to the wall. A former managing director of Cargill is still more categorical: "small companies have no real role; they have passed on their chips".

Seed Production

By and large, seed is produced under contract to small farmers. Sandoz, which attempts to minimise both its infrastructural and staffing investments, 'contracts' out to local seed companies. Arrangements for re-buying seed from growers vary. Sandoz takes the most laissez faire approach, refusing to enter written contracts with farmers or guarantee a price. The company does however guarantee that farmers will receive a 'profit' (i.e. that seed will be bought for a price above the market value of the grain). The only incentive for farmers to resell to Sandoz, rather than on the open market, is the threat of being dropped as a contractor. Indeed, the managing director is proud of his no-fuss relationship with his seed producers, quoting them as saying "Gokhale may skimp on the butter but he guarantees our bread". This approach contrasts

sharply with that adopted by Cargil. Here, it is claimed, emphasis lies upon a transparent agreement with growers, (albeit initially produced only in English) who are guaranteed a fixed price for the seed. There are strict criteria for accepting a farmer as a 'Cargill grower'. Farmers are required to follow stringent land management and fertiliser use guidelines. However, John Hamilton (the former managing director of Cargill) claims a 95% repeat grower rate.

Bhavani Seeds, a small seed company, is embittered, that the prices paid for hybrid seed produced under contract for multinational companies are significantly higher than they themselves can afford to pay (see Table 1.7). Bhavani pay twice as much for production of their hybrid seed as their open-pollinated sunflower seed. This is attributed to the increased stringency of growing conditions for hybrid seed. Farmers are expected to cooperate with their neighbors, such that if adjoins farms also want to produce sunflower seed, they too may be provided with Bhavani foundation seed. Bhavani do not guarantee purchase of the seed, which is first purity test. Failure of this test will entail farmers having to sell the seed on the open market.

Seed Retail

Profit margins are low, according to retailers. The management of a small retail outlet in Jalna claims that ProAgro hybrid maize seed, which is bought wholesale for Rs 33 per kilogram is retailed for Rs.35-37 per kilogram. Similarly, chili seed is bought wholesale for around Rs.14,000 per kilogram, and sold for 15-18,000 per kilogram. Open pollinated chili varieties are sold at a greater proportional mark up. For example, one public sector variety was bought wholesale for Rs.225 per kilogram, and sold for between Rs.275 and 300 per kilogram (see Table 1.10). The company also sells second generation open pollinated varieties (a market which would become illegal under Plant Variety Protection Law). In the case of chili seed, this retails for Rs.150 per kilogram (approximately half the price of first generation seed). According to the manager, these only achieve some 50% of the yield of the previous generation. This seed is apparently bought mainly by farmers with smaller holdings (note that there is general consensus that there is no correlation between the size of a holding and proportion of farmers buying hybrid seed).

TABLE 1.10
Wholesale and retail prices of a range of seeds (1997)

Crop	*Price of seed to retailer*	*Price to farmer*
ProAgro hybrid maize	Rs.33 per kg	Rs.35-37 per kg
ProAgro hybrid chili	Rs.14,000 per kg	Rs.15-18,000 per kg
Public sector OPV chili	Rs.225 per kg	Rs.275-300 per kg
Second generation OP	-	Rs.150 per kg
RASI hybrid cotton	Rs.265 per 450gm	Rs.275 per 450gm
Western Agri hybrid cotton	Rs.250 per 450gm	Rs.300 per 450gm
OPV cotton, produced by retailer himself	Pays growers Rs.25-27 per kg.	Rs.30-35 per kg

Source: *R.T. Karwa, Tryambak Krishi Kendra seed retailers, Jalna.*

The Brand-Name Effect

It is typically claimed by multinational companies that the premium prices charged for their hybrid seed are justified (and indeed only sustainable) on the basis of the superiority of their products, rather than reflecting heavy investment

in sales strategies. One approach to testing this claim is to consider instances where several companies sell the same hybrid seed. Here, widespread disparities in the pricing of the same seed may be attributable to the differing advertising policies and promotional strategies of specific companies. In practice, it is difficult to control other factors which may lead farmers to prefer one brand over another (for example, seed production standards, proximity of the company to its customer base, or after-sales service and complaints handling). Such comparisons are necessarily based upon sales of public-sector developed hybrids and varieties, which tend to be sold by smaller companies. These may be marked with the same certification code despite packaging by several different companies. Disparities in pricing can be large. For example, the managing director of Navalakha Seeds claims that he is able to sell a university developed cucumber variety ('Hemangi') for twice the price of some other competitor companies. (Mr. P. Navalakha claims sales at Rs. 140 per 50 grams, as opposed to competitor sales at Rs. 70. In fact, the Navalakha listed price prove to be Rs. 105 per 50 grams). In another example, the business manager of Hindustan Lever makes the more modest claim that they are able to sell a public-sector hybrid of sorghum ('Paras') for some 15% more than other competitor companies, something that is attributed to 'the reputation of Hindustan Lever for high quality seed production'. Variation in the pricing of the public sector-developed cotton variety NHH44 is shown in Table 1.11.

TABLE 1.11
Wholesale prices of the public-sector developed cotton variety NHH44 (1997)

Supplier	***Wholesale price of Cotton Variety NHH44***
Mahendra	Rs.280 per 750g
ProAgro	Rs.225
Zuari	Rs.255
Sandoz	Rs.210

Source: *R.T. Karva, Tryambak Kendra seed retailers, Jalna.*

Farmers are apparently becoming increasingly aware of brand name. The manager of Tryambak Krishi Kendra seed retailers, claims that Mahendra Seeds were the first to commercially release the NHH44 variety in the market. They now command a large market share in the variety, despite high pricing.

Another approach to assessing the role of marketing strategy in fixing prices is to look at regional variation in the price of the same seed, produced by the same multinational company Pioneer Hybrid, for example, admit to high pricing of their maize seed in Bihar, where the company profile is high. Elsewhere the same seed is sold at lower prices. Pioneer staff openly attribute this to the success of their advertising campaigns in the state, rather than the particular suitability of Pioneer maize seed to the local climate conditions and cropping patterns prevalent in Bihar.

Mr. Agrawal, the managing director of ProAgro-PGS, foresees that 'The brand-name will become more important. Farmers will ask more and more for branded seed. The same hybrid or variety (imported from public institutions and international agricultural centres) sold under various brand names will compete with each other and a strong brand name is expected to capture a large market share' (Agrawal, 1996).

5. Legislating For Privatisation

Under the Trade Related Intellectual Property Rights (TRIPs) arrangement of the World Trade Orgaisation (WTO), signatories are required to legally confer

The recent experience of the United States with plant intellectual property laws is especially relevant, as that's the model that is now being imposed on India and the rest of the South through the WTO / TRIPs. Over the past 30 years our experience is every time plant intellectual property laws have been amended, it expands the rights of industrial breeders at the expense of farmers, diversity and communities. It is clearly in the interest of those with money and power to amend any intellectual property system to strengthen their legal monopoly. Today under US patent law, it is illegal for farmers to save patented seed and re-use it. Monsanto requires farmers - its customers to sign a Gene Licensing Agreement before they can buy the company patented genetically engineered seeds. If the farmers are caught infringing the patent, Monsanto is "vigorously prosecuting" them in court. It is no exaggeration to say that farmers in North America have been turned into criminals and rural communities are becoming corporate police states.

- Hope Shand, *RAFI, USA*

exclusive property rights to seed producers. If these are conferred through 'legislation consistent with the International Union for the Protection of New Varieties of Plants, 1991 (UPOV91), farmers will be divested of their rights to exchange seed, and even to save seed for their own use. UPOV 91 thus "effectively extends the rights of plant breeders to all harvest derived from the original seeds". It amounts to legislation for the further privatisation of the seed industry-a process which has already been described as resulting from increased use of hybrids, and a decline in public sector seed development and production. In the UK, enforcement of plant breeder's rights has led to the progressive restriction of seed potato production. To begin with, holders of new plant variety rights demanded royalties from farmers producing seed potato from their products. Subsequently, permission to produce seed potato was restricted to farmers operating under contract to the plant breeder. Gradually, the acreage allocated to growers was reduced, contracts stipulated tighter specifications for seed potato production, and the prices paid diminished. Seed potato production became concentrated in the hands of a few companies who colluded to manipulate prices, and limit supply.

The Indian Seed Act and Patent Act: Sowing the Seeds of Dictatorship

Since the beginning of farming, farmers have sown seeds, harvested crops, saved part of the harvest for seeds, exchanged seeds with neighbours. Every ritual in India involves seeds, the very symbol of life's renewal.

In 2004 two laws have been proposed – a Seed Act and a Patent Ordinance which could forever destroy the biodiversity of our seeds and crops, and rob farmers of all freedoms, establishing a seed dictatorship.

Eighty per cent of all seed in India is still saved by farmers. Farmers indigenous varieties are the basis of our ecological and food security. Coastal farmers have evolved salt resistant varieties. Bihar and Bengal farmers have evolved flood resistant varieties, farmers of Rajasthan and the semi-arid Deccan have evolved drought resistant varieties, Himalayan farmers have evolved frost resistant varieties. Pulses, millets, oilseeds, rices, wheats, vegetables provide the diverse basis of our health and nutrition security. This is the sector being targeted by the Seed Act. These seeds are indigenous farmers varieties of diverse crops – thousands of rices, hundreds of wheats, oilseeds such as linseed, sesame, groundnut, coconut, pulses including gahat, narrangi, rajma, urad, moong, masur, tur, vegetables and fruits. The Seed Act is designed to "enclose" the free economy of farmers seed varieties. Once farmers seed supply is destroyed through compulsory registration by making it illegal to plant unlicensed

varieties, farmers are pushed into dependency on corporate monopoly of patented seed. The Seed Act is therefore the handmaiden of the Patent Amendment Acts which have introduced patents on seed.

New IPR laws are creating monopolies over seeds and plant genetic resources. Seed saving and seed exchange, basic freedoms of farmers, are being redefined. There are many examples of how Seed Acts in various countries and the introduction of IPRs prevent farmers from engaging in their own seed production. Josef Albrecht, an organic farmer in Germany, was not satisfied with the commercially available seed. He worked and developed his own ecological varieties of wheat. Ten other organic farmers from neighbouring villages took his wheat seeds. Albrecht was fined by his government because he traded in uncertified seed. He has challenged the penalty and the Seed Act because he feels restricted in freely exercising his occupation as an organic farmer by this law.

In Scotland, there are a large number of farmers who grow seed potato and sell seed potato to other farmers. They could, until the early 1990s, freely sell the reproductive material to other seed potato growers, to merchants, or to farmers. In the 1990s, holders of plant breeders' rights started to issue notices to potato growers through the British Society of Plant Breeders and made selling of seed potato by farmers to other farmers illegal. Seed potato growers had to grow varieties under contract to the seed industry, which specified the price at which the contracting company would take back the crop and barred growers from selling the crop to anyone. Soon, the companies started to reduce the acreage and prices. In 1994, seed potato bought from Scottish farmers for £140 was sold for more than double that price to English farmers, whilst the two sets of farmers were prevented from dealing directly with each other. Seed potato growers signed a petition complaining about the stranglehold of a few companies acting as a 'cartel'. They also started to sell non-certified seed directly to English farmers. The seed industry claimed they were losing £4 million in seed sales through the direct sale of uncertified seed potato between farmers. In February 1995, the British Society for Plant Breeders decided to proceed with a high profile court case against a farmer from Aberdeenshire. The farmer was forced to pay £30,000 as compensation to cover royalties lost to the seed industry by direct farmer-to-farmer exchange. Existing United Kingdom and European Union laws thus prevent farmers from exchanging uncertified seed as well as protected varieties.

In the US as well, farmer-to-farmer exchange has been made illegal. Dennis and Becky Winterboer were farmers owning a 500-acre farm in Iowa. Since 1987, the Winterboers have derived a sizeable portion of their income from 'brown bagging' sales of their crops to other farmers to use as seed. A 'brown bag' sale occurs when a farmer plants seeds in his own field and then sells the harvest as seed to other farmers. Asgrow (a commercial company which has plant variety protection for its soyabean seeds) filed suit against the Winterboers on the grounds that its property rights were being violated. The Winterboers argued that they had acted within the law since according to the Plant Variety Act farmers had the right to sell seed, provided both the farmer and seller were farmers. Subsequently, in 1994, the Plant Variety Act was amended, and the farmers' privilege to save and exchange seed was amended, establishing

absolute monopoly of the seed industry by making farmer-to-farmer exchange and sales illegal.

Similar laws are being introduced in India. The entire country is being taken for a ride with the introduction of the Seed Act 2004 on grounds that the Act is needed to guarantee seed quality. However, the Seed Act 1966 already performs the function of seed testing and seed certification. Twenty labs have been declared as seed testing labs under the 1966 Act in different States. Nine seed corporations have been identified as certification agencies.

Under pressure from World Bank the Seed Policy of 1988 started to dismantle our robust public sector seed supply system, which accounted for 20% of the seeds farmers grow. Eighty per cent of the seed prior to globalisation is the farmers' own varieties, which have been saved, exchanged and reproduced freely and have guaranteed our food security.

A Licence Inspector Raj for Seeds

The introduction of 2004 Seed Act needs to be assessed in the context of the simultaneous introduction of the 3rd Patent (Amendment) Act. Our 1970 Patent Law has been changed under the coersive pressure of WTO in spite of the overdue mandatory TRIPS review. Patents will now been granted for seeds, plants, micro-organisms, cells and even GMOs and animals.

Quite clearly a monopolistic patent regime cannot be established as long as farmers have the alternative of their own zero cost, reliable, time tested high value seeds of their traditional varieties of indigenous agro-biodiversity.

The Seed Act 2004 has one and only one objective of stopping farmers from seed saving, seed exchange and seed reproduction.

In the objective the 2004 Act clearly states that it is aimed at replacing farmers saved seeds with seeds from private seed industries.

The repeated reference to 'barter' in the Seed Act will prevent farmer's exchange, a necessary aspect of maintaining high quality seed supply at the community level.

Further the compulsory registration of seed combined with the power of seed inspectors to enter and search premises (which now mean farmers' huts and fields), the power to break open any container and any door is tantamount to creating a 'Seed Police' to terrorize farmers who are conserving biodiversity and practicing a sovereign self-reliant agriculture. The fine for seed exchange and barter of unregistered seed (thousands of farmers varieties has a fine of up to Rs. 25000). While criminalizing farmers who consume biodiversity and traditional varieties, the Seed Act fails to do one thing it should have done, which is to regulate and hold liable private seed industry for seed failure and genetic contamination from GMOs. For Example the failure of maize seeds in Bihar last year cost more than 1000 crores to Bihar farmers and the constant failure of Bt. cotton annually is costing more than a billion dollars to Indian farmers.

In the new Seed Act farmers can only claim compensation under the Consumer Protection Act. This option is in any way is available to the farmers presently and the brutal power of the Central Authority, which acts to prevent farmers from growing own seeds, provides no safety and remedy to our farmers from untested and hazardous seeds MNCs are selling in the Indian market.

The Seed Act has also undermined the role of the State governments. The Central Seed Committee in 1966 Act has representatives nominated by the government of each State. Now only 5 State will be represented in the Central Seed Committee and even these will be nominated not by the State governments but by the Centre.

The 2004 Seed Act has nothing positive to offer to farmers of India but offer a promise of a monopoly to private seed industries, which has already pushed thousands of our farmers to suicide through dependency and debt caused by unreliable, high dependency and non-renewable seeds.

The 1966 Act has served the country well and should continue to provide the framework for seed testing and seed certification.

Farmer varieties and indigenous agro-biodiversity is already been registered by Local Biodiversity Committee through Community Biodiversity Registers (CBRs). We do not need a Centralized Seed Authority with police power which uses compulsory registration to prevent farmers from growing, saving and exchanging their own seeds.

It is the MNC seed industry that need regulation and not the small farmers of our country without whose seed freedom the country will have no food sovereignty and food security.

Product Patent on Seeds

Methods of agriculture and plants were excluded from patentability in the Indian Patent Act 1970 to ensure that the seed, the first link in the food chain, was held as a common property resource in the public domain. In this manner, it guaranteed farmers the inalienable right to save, exchange and improve upon the seed was not violated.

But recently, two amendments have been made in the 1970 Patent Act. The 2nd Amendment makes changes in the definition of what is not an invention. This has opened the flood gates for the patenting of genetically engineered seeds.

According to Section 3(j) of the Indian Patent Act, the following is not an invention:

Any process for the medical, surgical, creative, prophylactic or other treatment of human beings or any process for a similar treatment of animals or plants or render them free of disease or to increase their economic value or that of their products.

In the 2nd Amendment however, the mention of "plants" have been deleted from this section. This deletion implies that a method or process modification of a plant can now be counted as an invention and therefore can be patented. Thus the method of producing Bt. cotton by introducing genes of a bacterium thurengerisis in cotton to produce toxins to kill the bollworm can now be covered by the exclusive rights associated with patents. In other words, Monsanto can now have Bt. cotton patents in India.

The Second Amendment has also added a new section (3j). This section allows for the production or propagation of genetically engineered plants to count as an invention. Its status as an invention thus deems it. But this section excludes as inventions "plants and animals including seeds, varieties and species and essentially biological processes for production or propagation of plants and

animals". Since plants produced through the use of new biotechnologies are not technically considered "essentially biological," section (3j) has found another way to create room for Monsanto. This loophole, couched in the guise of scientific advancement, thus allows patents on GMOs and hence opens the flood gate for patenting transgenic plants.

What is most concerning is how the language of section 3j is a verbatim translation into India law of Article 27.3 (b) of TRIPS Agreement. Article 27.3 (b) of TRIPS states:

Parties may exclude from patentability plants and animals other than micro-organisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes. However, parties shall provide for the protection of plant varieties either by patents or by an effective sui generis system or by any combination thereof. This provision shall be reviewed four years after the entry into force of the Agreement establishing the W.T.O.

As Monsanto had a hand in drafting the TRIPS agreement, it is not surprising that the Monsanto Amendments have also made their way into India's patent laws.

As Monsanto had a hand in drafting the TRIPS agreement, it is not surprising that the Monsanto Amendments have also made their way into India's patent laws.

However, Article 27.3(b) is under review. The Government should have insisted on the completion of the review, a commitment of the Doha Round, instead of changing India's Patent Law. As a result of sustained public pressure, after the agreement came into force in 1995, many Third World countries made recommendations for changes in Article 27.3 (b) to prevent biopiracy. India, in its discussion paper submitted to the TRIPS Council stated:

"Patenting of life forms may have at least two dimensions. Firstly, there is the ethical question of the extent of private ownership that could be extended to life forms. The second dimension relates to the use of IPRs' concept as understood in the industrialized world and its appropriateness in the face of the larger dimension of rights on knowledge, their ownership, use, transfer and dissemination

Informal system, e.g. the *shrutis* and in the Indian tradition and grandmother's portions all over the world get scant recognition. To create systems that fail to address this issue can have severe adverse consequences on mankind, some say even leading to extinction.

Clearly, we must re-examine the need to grant patents on life forms anywhere in the world. As we continue to assess this situation, in the meantime it may be advisable to:

1. Exclude patents on all life forms.
2. If (1) is not possible, then we must exclude patents based on traditional/ indigenous knowledge and essentially derived products and processes from such knowledge.
3. At the very least, we must insist on the country of origin to disclose the biological source and associated knowledge, and obtain the consent of the

country providing the resource and knowledge, to ensure an equitable sharing of benefits."

To prevent competitors from selling seeds and to prevent farmers from saving seeds, Monsanto has now turned to the patent laws to get monopoly rights. The Monsanto Amendments of India's patent laws are a logical consequence of the clearance for the commercial planting of GMOs in Indian agriculture, as we saw earlier with the March 26th decision of the Indian government to allow Bt. cotton.

Patents on seeds are a necessary aspect of the corporate deployment of GM seeds and crops. When combined with the ecological risks of genetically engineered seeds like Bt. cotton, seed patents create a context of total control over the seed sector, and hence over our food and agricultural security.

Looking with closer analysis, there are three ways that the 2nd Amendment and 3rd Amendment of the Indian Patent laws have jeopardized our seed and food security, and hence our national security.

Firstly, it allows patents on seeds and plants through sections 3(i) and 3(j), as we saw above. Patents are monopolies and exclusive rights which prevent farmers from saving seeds; and seed companies from producing seeds. Patents on seeds transform seed saving into an "intellectual property crime".

Secondly, genetic pollution is inevitable. Monsanto will use the patents and pollution to claim ownership of crops on farmers' fields where the Bt. gene has reached it through wind or pollinators. This has been established as precedence in the case of a Canadian farmer, Percy Schmeiser, whose canola field was contaminated by Monsanto's "Round up Ready Canola," but instead of Monsanto paying Percy on the basis of the pollute principle, Monsanto demanded $200,000 fine for "theft" of Monsanto's "intellectual property". Thousands of U.S. farmers also have been sued. Will Indian farmers be blamed for theft when Monsanto's GM cotton contaminates their crops? Or will the government wake up and enforce strict monitoring and liability?

When combined with the 3rd product patents amendment, these changes can mean absolute monopoly. A decision on a plant patent infringement suit has set a new precedent for interpreting plant patent coverage. In the case of Imagio Nursery vs. Daina Greenhouse, Judge Spence Williams, for the U.S. District Court for the Northern District of California, ruled that a plant patent can be infringed by a plant that merely has similar characteristics to the patented plant. When combined with the reversal of burden of proof clauses, this kind of precedence based on product patents can be disastrous for countries from where the biodiversity that gave rise to those properties was first taken, more so, if the original donors of the biodiversity are accused of 'piracy' through such legal precedence in the absence of the prior existence of laws on traditional knowledge that prevent the misuse of such legal precedence.

In countries, where plant patents are not allowed, patenting genes is available as an opening for patenting properties and characteristics of the plant, and hence having exclusive rights to those properties and characteristics. This is how Monsanto was able to establish monopolies on seeds through patents on genes in Canada, even though Canada does not allow potato on life forms.

Patent protection implies the exclusion of farmers' right over the resources

having these genes and characteristics. This will undermine the very foundations of agriculture. For example, a patent has been granted in the U.S. to a biotechnology company, Sungene, for a sunflower variety with very high oleic acid content. The claim was for the characteristic (i.e., high oleic acid) and not just for the genes producing the characteristic. Sungene has notified others involved in sunflower breeding that the development of any variety high in oleic acid will be considered an infringement of its patent.

Corporate Rights Vs Farmers Rights

The State is under siege. New Intellectual Property Rights (IPR) legislation is being introduced in the area of plant genetic resources (PGR) under pressure of the U.S. government as well as the requirements of the TRIPS agreement of the W.T.O. while W.T.O. gives a five year transition period to introduce PGR legislation, the U.S. pressure was to introduce such legislation immediately. Further, the U.S. has been demanding monopoly protection for Transnational Corporations (TNCs) which control the seed industry. On the other hand people's organisations are fighting to protect farmers' rights to their biodiversity and their right to survival as well as the freedom of scientists to work for the removal of hunger rather than corporate profits. Farmers organizations, biodiversity conservation groups, sustainable agriculture networks and public interest oriented scientists are trying to ensure that farmers' rights are protected, and through the protection of farmers' rights, sovereign control over our biological wealth and its sustainable use in agricultural production is ensured. The conflict over PGR legislation is a conflict between farmers and the seed industry and between the public domain and private profits, between an agriculture that produces and reproduces diversity and one that consumes diversity and produces uniformity.

On January 29, 1996 in an address at the Indian Institute of Agricultural Research, the Unite States Secretary of Agriculture, Mr. Daniel Glickman directly addressed the issue of the protection of seed Multinationals (MNCs). He said, "I hope our new legislation will provide a responsible and reasonable protection to private seed companies, which will encourage them to provide the best seeds available for your farmers. There would be very few inventions of anything, particularly in agriculture, without patent protection because it is the fundamental fact of nature that people will not go through the expense of development of new ideas just for the altruistic benefit of the human race.

The U.S. IPR orthodoxy is based on a fallacious idea that people do not innovate or generate knowledge unless they can derive private profits. However, greed is not a "fundamental fact of human nature" but a dominant tendency in societies that reward it. In the area of seeds and plant genetic resources, innovation of both the 'formal' and 'informal' systems has so far been guided by the larger human good. Norman Borlaug the scientist behind the Green Revolution and the recipient of the Nobel Peace Prize, made this clear in his statement at a Press Conference at the Indian Agricultural Research Institute, New Delhi on 8th Feb 96. He expressed concern against private companies and TNCs gaining control of plant genetic resources and seeds and patenting plants. Prof. Borlaug said, "We battled against patenting. I and late Glen Anderson (of International Wheat an Maize Research Institute) went on

record in India as well as other against patenting and always stood for free exchange of germplasm."

He saw IPRs in PGRs as a prescription for famine. Commenting on the U.S. demand for patents he said: "God help us if that were to happen, we would all starve."

Besides using a fallacious essentialist argument about human nature, Mr. Glickman also stressed the inevitability of farmers' dependence on MNCs for seeds due to trade liberalization and its impact on agriculture.

According to him,

> As income increases throughout Indian society, food needs will change higher vegetable oil consumption, a shift from rice to wheat in urban areas and some shifting from grain to poultry and livestock products. Also, the needs of the new food processing industries will change the types of crops demanded. Therefore, farmers must have access to new crop varieties in order to meet changing consumer preferences.

In other words, what the U.S. government is coercing the Indian government to do is introduce unhealthy fat and meat rich diets through the expansion of U.S. agribusiness, agroprocessing and fast food industry. The proposal is to replace the small peasant and farmer based agricultural economy of India with agribusiness controlled industrial agriculture. This shift is associated a transformation of farmers as breeders and reproducers of their own seed supply to farmers as consumers of propriety seed from the seed industry. It is also a shift from a food economy based on million of farmers as autonomous producers to food system controlled by a handful of TNCs which control both inputs and output. This is a recipe for food insecurity, biodiversity erosion and uprooting of farmers from the land.

It is often stated that IPRs will not stop traditional farmers using native seeds. However, the Seed Act 2004 is designed to do just that. Further when it is recognised that IPRs are an essential part of a package of agribusiness controlled agriculture in which farmers no longer grow native seeds but seeds supplied by the TNC seed industry, IPRs become a means of monopoly that wipe out farmers rights to save and exchange seed. This leads to TNC totalitarianism in agriculture. TNCs will decide what is grown by farmers, what they use as inputs, and when they sell their produce, to whom and at what price. They will also decide what is eaten by consumers, at what price, with what content and how much information is made available to them about the nature of food commodities.

IPRs are a significant instrument for the establishment of this TNC totalitarianism. The protection of the rights of citizens as producers and consumers needs the forging of new concepts and categories, new instruments and mechanism to counter and limit the monopoly power of TNCs in agriculture. Community rights are an important balancing concept for protecting the public interest in the context of IPR protection for corporations. In the field of food and agriculture, farmers' rights are the countervailing force to breeders rights and patents on seed and plant material. Farmers' rights in the context of monopoly control of the food system become relevant not just

for farming communities, but also consumers. They are necessary not just for the survival of the people but also for the survival of the country. Without sovereign rights of farming communities to their seed an plant genetic resources, there can be no sovereignty of the country.

Farmers' rights are an ecological, economic, cultural and political imperative. Without community rights, agricultural communities cannot protect agricultural biodiversity. This biodiversity is necessary not just for the ecological insurance of agriculture. Rights to agricultural biodiversity is also an economic imperative because without it our farmers and our country will loose their freedom and options for survival. Since biodiversity and cultural diversity are intimately linked, conservation of agricultural biodiversity is a cultural imperative also. Finally, without farmers' rights, there is no political mechanism to limit monopolies in agriculture and inevitable consequence of displacement, hunger and famine that will follow total monopoly control over food production and consumption through the monopoly ownership over seed, the first link in the food chain.

Patent on Seed

Patents on seeds are a necessary aspect of corporate deployment of GM seeds and crops. When combined with the ecological risks of genetically engineered seed like Bt. cotton, patents on seeds create a context of total control over the seed sector, and hence over our food and agricultural security.

This is why China has banned foreign investment in the area of genetically modified seed.

There are 3 ways in why the 2nd Amendment of the Patent Laws jeopardised our seed and food security and hence our national security.

Firstly, it allows patents on seeds and plants through 3(i) and 3(j). Patents are monopolies and exclusive rights, which will prevent farmers from saving seeds and seed companies from producing seeds. Patents on seed transform seed saving into an "intellectual property crime".

Secondly, since genetic pollution is inevitable, and the condition of 2% refugia in the GEAC clearance is a recognition of the inevitability of genetic pollution, Monsanto will use the patents + pollution to claim ownership of crops on farmers' fields where the Bt. gene reached through wind or pollinators. This has been established as precedence in the case of a Canadian farmer, Percy Schmeiser whose canola field was contaminated by Monsanto's *Round up Ready* Canola, but instead of Monsanto paying Percy on the basis of the polluter principle, Monsanto demanded $200,000 fine for "theft" of Monsanto's "intellectual property". Thousands of U.S. farmers have also been sued. Will Indian farmers be blamed for theft when Monsanto's GM cotton contaminates their crops? Or will the government wake up and enforce strict monitoring and liability?

Finally, the emergence of resistance in pests like Bollworm and creation of super pests is another inevitable consequence of Bt. cotton. Monsanto's research strategy of "gene pyramiding" is an acceptance of the creations of super pests. As super pests spread, farmers will be forced to turn to Monsanto for seed supply and hence will be trapped in Monsanto's patent monopoly.

The Monsanto Amendments of the Patent Act run counter to Section 3(h) of the Act, which excludes methods of agriculture from patentability. Will 3(h) guide the rejection of Monsanto Bt. patents or will Monsanto once again subvert law and democracy and claim patents on Bt. cotton?

The humble cotton inspired India's movement for independence through the *Charkha* and *Khadi*. In the age of globalisation and biotechnology, the future of the freedom of Indian people is once again linked to the fate of cotton. Will India and her farmers and cotton be enslaved by Monsanto patents, or will the freedom of plants and freedom of peasants be defended and protected? These are the issues raised by the Second Amendment of the Patent Act.

Protection of Plant Varieties and Farmer's Rights Act, 2001

The Protection of Plant Varieties and Farmers' Rights (PVPFR) Act, 2001, is now a reality. The PVP Bill was passed in both the Houses of the Parliament in the Monsoon Session in August 2001. This Act is based on the report submitted by the Joint Select Committee on the Protection of Plant Varieties and Farmers Rights Bill, 1999, under the chairmanship of Sahib Singh Verma. The revised draft proposed by the Committee was the fifth version of this Act in last eight years since 1993. Interestingly the first draft was ready in 1993, two years ahead of the WTO coming into existence.

The PVPFR Act has been legislated under the obligation of Art. 27(3)(b) of the TRIPS Agreement which mandates for the protection of plant varieties either by patent or by an effective *sui generis* system or by any combination thereof.

Because of the major mobilisation on farmers rights, beginning with the first draft, clauses on farmers rights had to be added, and farmers rights were also put in the title of the Act.

Chapter VI, Section 39 of the Act is on Farmer's Rights. Farmers Rights are defined as follows:

Chapter VI, Farmers Rights

Section 39

1) Notwithstanding anything contained in this Act-

(i) A farmer who has bred or developed a new variety shall be entitled for registration and other protection in like manner as a breeder of a variety under this Act.

(ii) The farmer's variety shall be entitled for registration if the application contains declarations as specified in clause (h) of sub-section (1) of section 18.

(iii) The farmer who is engaged in the conservation of genetic resources of land races and wild relatives of economic plants and their improvement through selection and preservation shall be entitled in the prescribed manner for recognition and reward from the National Gene Fund;

Provided that material so selected and preserved has been used as donors of genes in varieties registrable under this Act:

(iv) Shall be deemed to be entitled to save, use, sow, resow, exchange, share or sell his farm produce including seed of a variety protected under this Act in the same manner as he was entitled before the coming into force of this Act;

Provided that the farmer shall not be entitled to sell branded seed of a variety protected under this Act

Explanation: For the purpose of clause (iv) branded seed means any seed put in a package or any other container and labeled in a manner indicating that such seed is of a variety protected under this Act.

(2) Where any propagating material of a variety registered under this Act has been sold to a farmer or a group of farmers or any organisation of farmers, the breeder of such variety shall disclose to the farmer or the group of farmers or the organisation of farmers, as the cay may be, the expected performance under given conditions, and if such propagating material fails to provide such performance under such given conditions as the farmer or the group of farmers or the organisation of farmers, as the case may be, may claim compensation in the prescribed manner before the Authority and the Authority shall after giving notice to the breeder of the variety and after providing him an opportunity to file opposition in the prescribed manner and after hearing the parties, it may direct the breeder of the variety to pay such compensation as it deems fit, to the farmer or the group of farmers or the organisation of farmers, as the case may be.

This clause has led to the celebration of India's Plant Variety law as a pro-farmer sui generis legislation. This clause on farmer's rights reflects the success of movements in the defense of farmer's rights. This is also the reason for corporations are unhappy with the PVPFR Act and are trying to introduce a Seed Act.

However, the Act is deficient in upholding farmers rights in other clauses.

The PVPFR Act seeks to allow Intellectual Property Right (IPR) protection on seeds of all agricultural crops, and denies farmers' their rights to agricultural biodiversity.

The government believes that the plant variety protection to commercial plant breeders will lead to increased food production, greater food security and development of new varieties. But the fact is the commercial seed sector is primarily engaged in research on hybrid technology in a few commercial crops like sunflower, maize, soybean, cotton etc. The food production is almost entirely in the hands of small farmers who largely use farm saved/ open-pollinated seeds. The focus of the private sector is to convert over 80% of farmers who still use farm saved seeds to hybrids (and increasingly to transgenic varieties) and thereby, wittingly or unwittingly, from primarily growing food crops to cash crops.

Cash crops are in any case not bringing farmers cash, as the experience of potato and sugarcane farmers in UP shows. Providing for private monopolies in agriculture will only encourage private companies to mount increased pressure on the small farmer to purchase their commercial seed, which will

adversely affect cropping patterns and food production. Several attempts are being made in different parts of the country to replace farmers' collection of indigenous varieties with hybrid and HYV varieties to make them dependable on purchased seeds. The shift to unreliable hybrids is threatening farmers' livelihood, as the failure of hybrid maize in Bihar and Rajasthan shows.

The PVPFR Act provides for farmers rights and allows farmers to save, use, sow, resow, exchange, share or sell his farm produce including seed of a variety protected under this Act in the same manner as he was entitled before the coming into force of this Act. But they are not allowed to sell branded seed of a variety protected under this Act. And Branded seeds means 'any seed put in a package or any other container and labelled in a manner indicating that such seed is of a variety protected under this Act'. Given case law in Plant Variety Protection, even "brown bagging" and farmers exchange has been treated as "commercial" sale by seed corporations. This clause could thus undermine farmers' rights rather than protect it, unless a genuinely independent *sui generis* law on farmers' rights is evolved.

Monopolies over seed production:

Through the PVPFR Act, the Multinational Seed Companies are seeking total control of seed, the first link in the food chain. And through control over seed, they control the food system. If all farmers, who are the original breeders, could be forced into the market every year, the seed industry will have a $7.5 billion market. The impact of the new seed laws needs to be assessed in the context of the monopolies already in place in the industrialized countries. Even in India, while many companies seem to be making Bt. cotton, the intellectual property rights to Bt. gene are in the hands of one company, Monsanto. IPR's on seed are thus creating seed monopolies.

Not only is the seed industry gaining total control over seed supply, it is also getting increasingly concentrated. The PVPFR Act would prove to be an effective tool through which the consolidation of seed companies over Indian agriculture would accomplish. The stronger the rights of TNCs, the weaker are the rights of farmers since it is the erosion of farmers' rights, which creates MNC's monopolies.

"Benefit Sharing", as an instrument to undermine farmers rights:

The Act pays lip service to the idea of royalty payment to farmers when their varieties are used for breeding new variety through the mechanism of "benefit sharing". Instead of farmers rights being recognised as collective, community rights derived from their having evolved traditional varieties collectively and cumulatively, benefit sharing replaces farmers "rights" with rights of the seed industry, with farmers receiving a small payment. Which farmers will be paid and the amount of payment is left to a District Magistrate.

However, given the fact that farmers' varieties have been developed by millions of farmers across large geographical regions, it is difficult, even in a well-structured system to identify the beneficiaries and distribute equitably the benefits among them. Moreover the system of benefit sharing is very unreliable. The benefit sharing is made subject to the commercial utility of the "new"

derived variety (26.5.b). Moreover the benefit will be recovered as arrears of land revenue by the District Magistrate within whose jurisdiction the breeder liable for such benefits sharing resides (26.7). However, seed corporations which control IPRs are not producers, hence this mechanism is flawed at its very roots.

Since most of the seeds are being bred by the Multinational seed companies with their headquarter in a foreign land, in this case who would recover the benefit from the breeders.

Moreover the benefit sharing is made subject to claim if any (26.2). If no one makes claim for benefit sharing, there is no voluntarily recognition of benefit sharing by the breeder or the Authority based on the passport data. Keeping in mind the literacy status of our farmers as well as the access to Government Gazette, most of the cases of biopiracy would go unnoticed. The alternative is to recognize farmers as breeders and protect their community rights to their collective, cumulative innovation through a genuinely *sui generis* law made for protection of traditional knowledge.

Very Harsh Penalties for Farmers:

While the breeders are provided with very strong protection, the Act provides for very harsh punishment to farmers (violators) for the infringement of breeders rights. The penalties are prescribed not only for copying the packaging but also the registered name or denomination of the registered variety or giving their variety a denomination deceptively similar to the registered variety (64). The breeders' rights are so strong that even the slightest doubt of violation or infringement on the part of the breeder, the onus of proving the innocence is upon the alleged violators (farmers). Whether it is the case of demanding benefits for using their variety or for proving innocence for infringement of breeders' rights, the onus is put on the poor farming community.

If a violator fails to prove that he acted in innocence, the penalty is very harsh which also includes jail term. If a person applies any false denomination to a variety, or misrepresent the address of the breeder of a variety registered under this Act in course of trading such variety; he shall be punished with imprisonment for a term not less than three months but may extend to two years; or fine which shall not be less than fifty thousand rupees but which may extend to five lakh rupees; or both (70).

In case of repetition of violation, the minimum jail term is one year which may extend to three years and the fine from two lakhs which may extend to 20 lakhs rupees or both (73).

The rights of the farmers to claim benefit for use of their variety is very weak in comparison to the rights of the breeders for protection of their knowledge. Given the cases of biopiracy such as "basmati" and the attempt by Syngenta to get access to the rice collections of Chhattisgarh made by Dr. Richaria, farmers cultivating their own varieties could be treated as violators given the reversal of burden of proof. The only safeguard for farmers is a *sui generis* law on traditional knowledge, which protects farmers' rights and their freedom to use their seeds and innovations without threat from corporate pirates.

Corporations are misusing IPRs to criminalize innocent farmers as the case of Percy Schmeiser shows.

No Corporate Liability, No Protection for Farmers Against Seed Failure:

The PVPFR 2001 Act does not provide any strong protection to the farmers in case of failure of registered varieties. In view of failure of Bt cotton, the farmers of Warangal suffered a loss of Rs. 16,657 per hectare (*National Herald*, New Delhi, 9th June 2003) and no compensation was paid to the victim farmers as yet.

The Act provides that "… if such propagating material fails to provide such performance under such given conditions as the farmer or the group of farmers or the organisation of farmers, as the case may be, may claim compensation in the prescribed manner before the Authority and the Authority shall after giving notice to the breeder of the variety and after providing him an opportunity to file opposition in the prescribed manner and after hearing the parties, it may direct the breeder of the variety to pay such compensation as it deems fit, to the farmer or the group of farmers or the organisation of farmers, as the case may be (39.2).

This protection is very weak and cannot act as a deterrent. The frequent seed failure and the suicides of farmers due to the loss of crops demands a severe punishment to the breeder in case of failure of their seeds or propagating materials. The absence of liability clause and the replacement of a locally accessible justice system by centralized Authority increases the power of seed corporations and robs the farmers of any reliable access to claims for compensation and holding corporation liable for seeds failure and false claims.

Very Weak Researchers Rights:

The PVPFR Act seeks to restrict the rights of the researchers and broadens the rights of the plant breeders. Researchers have to take permission of the breeders for repeated use of a protected variety as parental lines. It says "the authorization of the breeder of a registered variety is required where the repeated use of such variety as a parental line is necessary for commercial production of such other newly developed variety'.

No breeder would ever authorize others for repeated use of his/her protected variety for commercial propagation. And no researcher would ever do research on a variety if he cannot commercialize it. Hence the Act restricts the researchers' rights and grants extended monopoly to the breeder. The Act thus negates the right to free access to protected varieties for further development of new improved varieties, and also negates any true competitiveness, which would reduce the price of seeds.

Regulations

Several company representatives alluded to the need for 'simplification' of mechanisms regulating the development of transgenic crops: "Regulation to commercialise the transgenic seed/products are quite strict, time consuming and far from transparent. In many countries in the world, one is not required to seek permission from the regulatory department to conduct trial with transgenic seeds, but simply to inform about the intention to conduct such a trial... India should become more transparent with respect to introduction of transgenic seeds and regulations should become more simple" (Agrawal, 1996)

In fact, the Department of Biotechnology Guidelines for Safety in Biotechnology covering recombinant DNA technologies in micro-organisms, large scale industrial processes, field trials of transgenic plants, and quality control of biological material obtained by recombinant DNA processes, runs to just fourteen pages. Whilst these guidelines are mandatory, K. Kumar of the Centre for Cellular and Molecular Biology in Hyderabad, notes that there are as yet no mechanisms for penalising those found to be contravening them.

In practice, however, it seems that the agribiotech industry has precious little ground for complaint. The former managing director of Monsanto, whose trials of transgenic cotton have reached large acreage stages, has remarked at the ease with which permission was granted for each stage of the development of the crop in India. Department of Biotechnology permission was required, or will be required, for import of the Bt construct, transfer to Mahyco cotton lines, outdoor planting, large acreage trials, and commercial release. At no point during this process was Monsanto's schedule interrupted by deals in permission being granted. Indeed, in another context (development of BST for commercial release in India), approval was obtained by a single part-time employee within just twelve months.

Extending Hybrid Technology

Compounding one technology superfluity with another, the range of crops amenable to hybrid development is being extended. This is achieved through genetic contrivances which introduce male sterility to previously self-fertilising plants. Examples are provided by ProAgro -PGS's SeedLink system, which has been introduced to mustard, or SPIC's male sterile rice. There is growing private sector interest in the paddy market, following the development of hybrid rice (ProAgro, for example, have recently set up Rice Hybrid International).

There are several grounds for expecting that the seed industry will coalesce under the control of a few large companies, with foreign interests. (1) Hybrid seed is produced principally by larger seed companies, and its use is set to increase following the decline of the public sector; public sector efforts to increase farmer's acceptance of hybrid seed, and decreased use of farmer-saved seed; and private sector promotions and advertising strategies. (2) Smaller companies will experience increased difficulty to compete because; the market is fickle, smaller companies may find difficulty surviving a swing in favour of competitors' seeds; and plant variety protection will scotch a market in second and subsequent generations of both open pollinated and hybrid seed. (3) There will be an increased use of transgenic crops, which are produced only by those companies able to meet the high development costs. Small companies will thus be excluded from a market sector, which is likely to grow.

Seed Monopolies: Monsantoisation of Indian Agriculture

Making Matters Worse and Wiping out Farmers

In the name of Second Green Revolution, the Government is now promoting genetic engineering, corporate farming and capital intensive agriculture, which is one of the causes of the agrarian crisis. Yet it is being offered as "renewal of Indian Agriculture" based on biotechnology and new seeds. This was the

theme of the Prime Minister's speech at the recent Science Congress and the content of the U.S. – India agriculture agreement. Officials prepared the joint "Knowledge Initiative on Agriculture" before President Bush's visit in March. It is claimed that initiative will promote cooperation between U.S. and India on research, education and commercial links. The first Green revolution, which has destroyed our soil and water, our seeds and biodiversity, also emerged as a U.S. led initiative.

However, the 'Second Green Revolution' based on biotechnology is failing the farmers as the 'First Green Revolution' has done before it. The Second Green Revolution, based on biotechnology and genetic engineering will have even higher social and environmental costs than the first one. (Shiva 2006)

i) Green Revolution vs. Gene Revolution

The Green Revolution (GR) was a publicly owned technology, belonging to the people. The research was conducted with public money to fulfil a public need, inadequate food production, and it created public goods to which everyone had access. There were no Intellectual Property Rights (IPR), no patents vested in multinational companies, no proprietary technologies or products. If there was ownership of the GR, it was vested in the farmer. Once the seed reached the farmers, it was theirs; they moved it where they wanted. Therefore despite its faults, the Green Revolution addressed farmers' needs and India's food production showed an up ward curve. (Sahai 2006)

The Gene Revaluation or the Evergreen Revolution or the Agri-biotechnology is almost the exact opposite. It is a privately owned technology. Six corporations (Monsanto, Syngenta, Bayer CropScience, DuPont, Dow and BASF Plant Science) control practically the entire research and output in the field of transgenic plants. Processes and products, including research methodologies are shackled in patents and the farmer has no say, let alone any control. The technology creates only private goods that can be accessed only at significant cost (a bag of Mahyco-Monsanto's Bt cotton seeds in India costs Rs. 1600 as compared to between Rs. 300 to Rs. 400 for superior varieties produced locally).

The seed belongs to the company, which strictly controls its movement. With the development of the popularly termed 'terminator' or sterile seed technology, the farmer is reduced to a helpless consumer, not a partner as in the case of the GR. The Gene Revolution has in its 20 years, not yet produced a crop variety that has any direct connection to hunger and nutritional needs. The most prevalent crops remain corn, Soya, cotton and canola and the dominant traits are herbicide tolerance and insect resistance. Despite its other faults, the Green Revolution was able to put out a number of crop varieties in a short span of time that enabled direct yield increases, which brought immediate benefits to farmers. That in short is the contrast between the two Revolutions, so assiduously camouflaged by the Agbiotech.

Shiva, Vandana 2006, "From Seed to Retail: Creating Monopolies in Agriculture", Swedeshi Patrika, Feb, 2006, New Delhi.

Sahai, Suman 2006, "Gene Revolution is Dangerous" Swedeshi Patrika, Feb. 2006, New Delhi.

The controversial Seed Bill 2004 introduced in India, which has now been referred to a Parliamentary Select Committee, lays emphasis on ensuring quality of improved seed being supplied to farmers. It seeks to make it mandatory for farmers to grow seed that is registered, a proposal that has come under severe criticism from the farmers as well as the civil society.

Monsanto sells its GM cotton seed to Indian farmers at the same price as it sells in the U.S. The price of transgenic seed (Rs. 1600 for 450 gms) has a 'royalty' component of Rs. 1200, even though Monsanto does not have a patent for Bt. Cotton in India. In contrast, local seeds are sold for Rs. 550 a kg. Farmers' suicides in Vidarbha overlap with regions where Monsanto sold its GM seeds. For the farmers of Andhra Pradesh and Maharashtra, Bt. Cotton has emerged as a killer. The Andhra Pradesh Government has filed a case before the Monopoly and Trade Practices Commission in Delhi against Mahyco-Monsanto Biotec (India) Ltd. (MMBIL), challenging the 'revenue model' adopted by the multination for sourcing its transgenic Bollgard cotton seed technology to Indian Companies. Terming the company's decision to collect Rs. 1250 as royalty on each packet of cotton seeds sold in the state as a fit case to punish it under the MRTP Act, the State Government argued that Andhra farmers were forced to pay through the nose. Obviously, as seed monopolies grow, prices of seed will increase. (Shiva 2006)

While costs of production rise, prices of agricultural produce are falling, not because of "efficiency" and "productivity" but because of $400 billion subsidies and agribusiness monopolies which drive prices down.

The forced removal of Quantitative Restrictions (QRs) by WTO has linked the falling prices at the domestic level, robbing our farmers of nearly Rs. 1000 billion every year, and robbing thousands of their lives as they commit suicide in despair. This decline of prices will be further accelerated if giant retail chains enter India and start to dictate prices.

World's Top 10 Seed Companies

Company	***2004 Seed Sales (US Millions)***
1. Monsanto (US) + Seminis (acquired by Monsanto 3/05)	$2,277 + $526 pro forma = $2,803
2. Dupont / Pioneer (US)	$2,600
3. Syngenta (Switzerland)	$1,239
4. Groupe limagrain (France)	$1,044
5. KWS AG (Germany)	$622
6. Land O' lakes (US)	$538
7. Sakata (Japan)	$416
8. Bayer Crop Science (Germany)	$387
9. Taikii (Japan)	$366
10. DLF-Trifolium (Denmark)	$320
Monsanto has emerged as the biggest seed corporation of the world	

(Shiva 2006)

The Walmartisation of Indian Agriculture

Wal-Mart is waiting to take over India's retail, which offers livelihoods to the largest number of people after agriculture. In fact, in the context of the agrarian crisis caused by WTO driven trade liberalization, retail offers the employment of last resource.

Top 10 Global Food Retailers

Company	*2004 Revenue $ Millions*	*% Global Market Share (Grocery Retail)*
1. Wal-Mart (US)	$ 287,989	8%
2. Carrefour (France)	$99, 119	3%
3. Metro AG (Germany)	$76,942	2%
4. Ahold (Netherlands)	$70,439	2%
5. Tesco (UK)	$65,175	2%
6. Kroger (US)	$56,434	2%
7. Costco (US)	$52, 935	2%
8. ITM enterprises (France)	$51,800	1%
9. Albertson's (for sale) US)	$39,897	1%
10. Edeka Zentrale (Germany)	$39, 100	1%
Source : ETC Group		

(Shiva 2006)

Wal-Mart is the biggest player in retail. In a report "Oligopoly Inc. 2005", the ETC Group has shown that consolidation, cut throat competition and aggressive global expansion are the driving forces in the food retail sector. In 2004, the top 10 global food retailers accounted for combined sales of $840 billion, 24% of the estimated $3.5 trillion global market. This was up from $513.7 billion in 2001. If Wal-Mart and other retail chains get a foothold in India, it will mean displacement of small retailers and farmers.

The table above gives the revenues of the global food retail industry.

These retailers are changing market to "hypermarkets". Explosive growth of these giant food retailers is predicted for Asia and Latin America. Asia is predicted to account for 41% share of the global retail market in 2020. According to IGD, a U.K. based market research firm, India will become the 4th largest grocery retail market by 2020. Wal-Mart has already announced that it is looking for a swift entry into India.

Multinational food retailers like Wal-Mart wield extraordinary economic and trade power. According to ETC, "these companies decide where and by whom a staggering share of the world's food is produced, processed and procured. Thus Wal-Mart sources most of its products from factories in China, where 80% of the 6000 factories that supply to Wal-Mart are located.

The food and agriculture organization has warned that the dominance of global supermarkets "has led to consolidated supply chains in which buyers for a handful of giant food processors and retails wield increasing power to set standards, prices and delivery schedules".

Hyper markets displace diversity, quality and taste and replace it with uniformity, quantity and appearance. As Tobias Reichart reports: "to ensure

timely delivery to numerous retail outlets, companies like Wal-Mart prefer to buy large amounts of products meeting uniform standards from a limited number of supplies. The contracts are often designed in a way that allows retailers to place orders on very short notice, refuse products for quality reasons and pay several months after delivery, thereby cap turning value while passing business risks to suppliers and farms". In Kenya as retail chains started to influence food production and food distribution, the share of small farmers in horticultural exports decreased from 70% to 18% in the 1990's, while large commercial farms and export companies with their own production make up more than 80%.

The profile of India's retail sector with its overwhelming preponderance of small and self-employed retailers is a direct consequence of our inability to provide gainful employment to the millions who join the workforce each year.

At last count these numbered about 45 million. These are not just "mom and pop" businesses, such as the neighbourhood Kirana shop. For every one of them, there are dozens of handcart and pavement vendors with little more than a pile of vegetables or fruits as their investment for survival. (Guruswamy, 2006)

Food produce accounts for over 14 per cent of all retail trade and most of our small retailers are employed in this sub-segment. It is important to remember that most of them are in this business out of necessity and not by choice.

A U.K. Government Competition Commission Enquiry identified 27 practices by supermarkets that were against the public interest. The Commission also uncovered regular selling by all major retailers below the cost of product, a practice retailers call price flexing. This led to negative margins for suppliers. Average operating margins were 2-4%. Through global expansion, facility India's position in WTO on liberalization of services could well see the Walmartisation of Indian Agriculture. More farmers will be driven off the land, or into debt and suicide.

The "U.S. – India Knowledge Initiative in Agriculture" is being driven by Monsanto and Wal-Mart. This is the much-touched Second Green Revolution which will undermine our farmer's livelihoods and our food sovereignty. And it will rob millions who depend on tiny retail for their livelihoods. The corporate control of food and agriculture, from seed to retail, is a recipe for disaster in our context of more than 650 million farmers and millions involved in retail at the tiny scale, from the "theli wala" who brings vegetables to our doorstep to the women who carry baskets of their produce to sell directly to consumers. Walmartisation of Indian agriculture will create more poverty for our people. It will also leave India poorer as a culture and civilization, in which the real free trade takes place face-to-face on our streets and in our haats and bazaars. Box stores and hypermarkets will rob India of her diversity and decentralized economy, which is the source of our resilience and real wealth of the people. (Shiva 2006)

Even before the ink fired on the technical cooperation agreement, needs report, pointed out that two of the American multinational, Monsanto and Wal-

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Guruswamy, Mohan 2005, "We Don't Need Wal-Mart", Swadeshi Patrika, Nov. 2005, New Delhi.

Mart have already said that they are not interested in research and development in India but on the increased trading opportunities that Indian offers.

Homicidal Seeds vs. Seeds of Life

When the 8th conference of the UN Convention on Biological Diversity took place in Curitiba, Brazil in March alongwith the meetings on the Biosafety Protocol, homicidal seeds of the biotechnology industry was at the top of the agenda. Homicidal seeds are seeds that kill biodiversity, farmers and peoples freedom. Monsanto's Bt. Cotton has already pushed thousands of Indian farmers into debt, despair and death. The Australian, New Zealand and Canadian governments, acting as instruments of the U.S government and the biotech industry, are trying to undermine the existing moratorium on Terminator Technology – genetically engineered plants which produce sterile seeds. And on February 7th, in a dispute initiated by U.S, Argentina and Canada against Europe, the WTO has ruled that citizens freedom to choose the crops they grow and the foods they eat has no place in a world where rules are created for the freedom of corporations to trade and profit.

COP8 was a contest between governments standing for the rights of their farmers to seed freedom and the rights of their citizens to food freedom vs governments stand for the freedom of the biotechnology industry to kill farmers, biodiversity and democracy.

Bt. Cotton, a genetically engineered cotton sold by Monsanto has repeatedly failed the farmers in India since Monsanto initiated the trials illegally in 1998, and since the seeds were allowed to be sold commercially in 2002. Monsanto's advertising promised farmers 15 quintal of yields / acre and Rs. 10,000 of additional incomes. However for many farmers Bt. Cotton has totally failed. In the 2005 season, farmers like Sukhlal, Chamar, Nander Singh, Shiv Charan, Prem Singh, Manohar Singh, Madan Lal, Manohar, Dhanna Lal, Shree Ram, Jhajju Bhar, Ramdhan Bhar, Laxmi Narayan in Nimad, Madhya Pradesh and Tulsiram, Narender Rathor, A.M. Subedar, Sudhakar Govind Rao, Sahidrao Piraji, Manhar Bhadhar, Mama Sahib Nirmal, Ashok Rao Nirmal, Sekh Navi, Sekh Biram, Dilip Kaunda, Sukhdev Thoor, Gajanand Dhage, Gyan Bhaji Supare, Namdev Rao Jhade in Vidharba, Maharashtra lost their entire crop. Others got average yields of 3 quintals per acre at average costs of Rs. 6000 per acre.

Our surveys of earlier planting seasons showed average yields of 1.2 quintals per acre in Maharashtra and Andhra Pradesh.

A study by the Center for Sustainable Agriculture showed that Bt. Cotton farmers used seed that cost Rs. 1600 per acre, while organic farmers used seed of Rs. 450 per acre, a 355% difference. Bt. Was sprayed with pesticides like Monocrotuphos, Confidor, Tracer, Eudosulfab, Acephate, Demethoate, Imidacloprid, Quinalphos, Chlorpyriphos, Cypermethrin, etc. On an average pesticides were sprayed 3.5 times, costing Rs. 2632 per acre. Organic farmers used ecological pest control agents like Neem, Trichoderma, Panchakavya etc. at Rs. 382 per acre. This is a difference of Rs. 2250/- or Rs. 7625/- per acre. Pest control in Bt. Cotton is thus 690% more costly than in ecological farming.

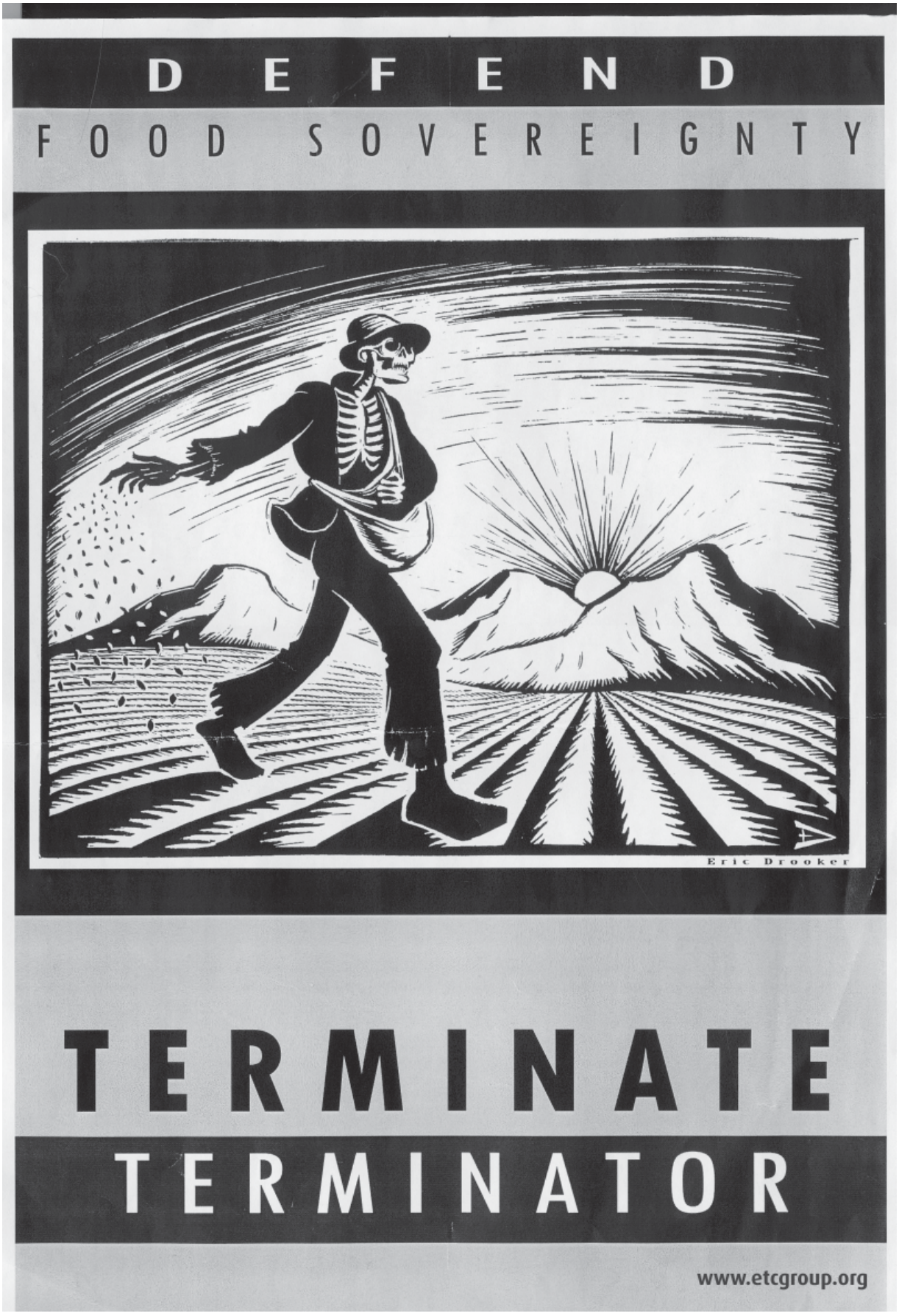
High costs of cultivation, and low returns have trapped Indian peasants in

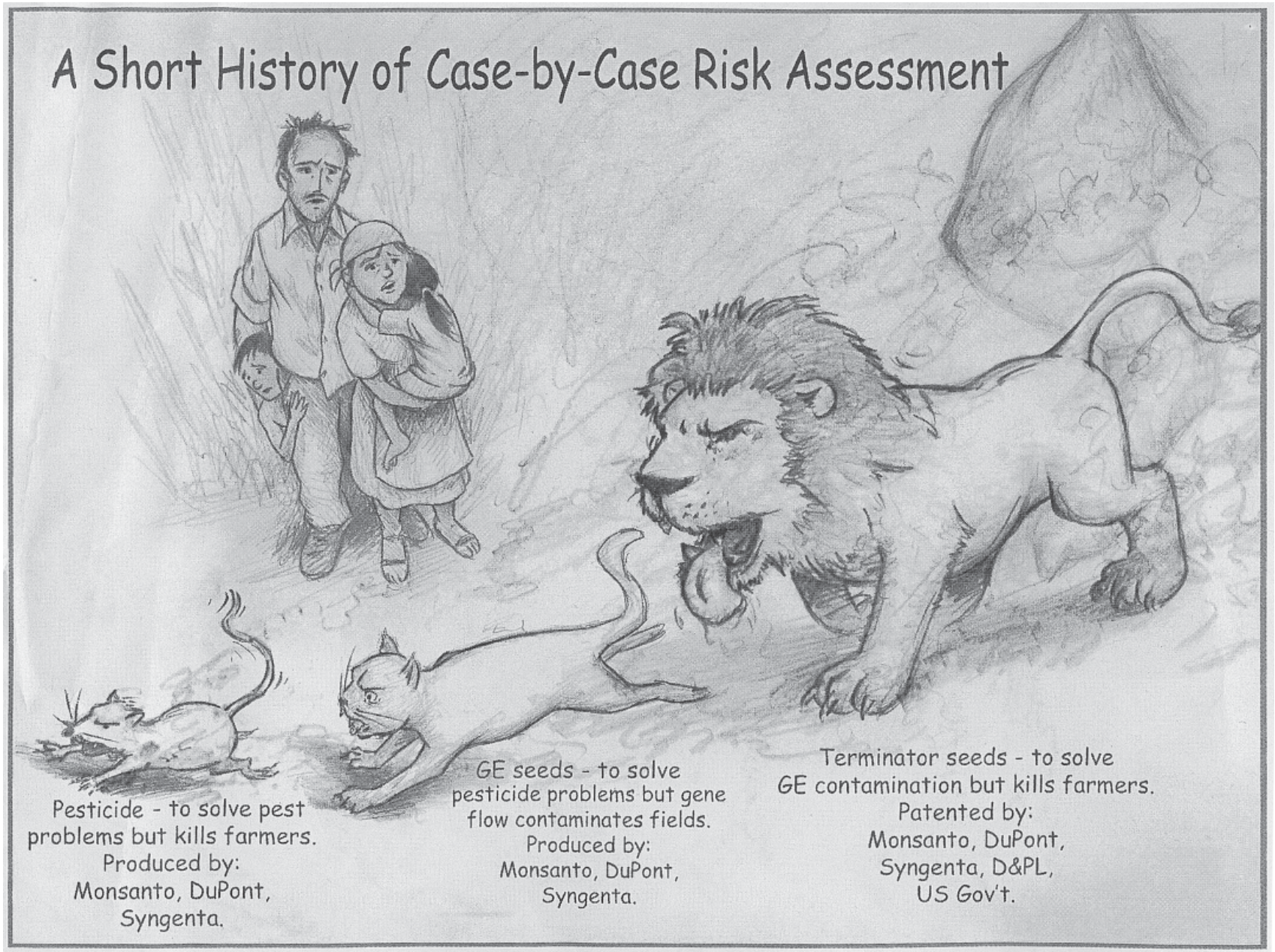
a debt trap, from which they are escaping by taking their lives. More than 40,000 farmers suicides have taken place over the past decade in India. However, these are not suicides – this is homicide, it is genocide. More than 90% of farmers who died in Andhra Pradesh and Vidharbha in the 2005 cotton season had planted Bt. Cotton. Genetic Engineering is killing Indian farmers.

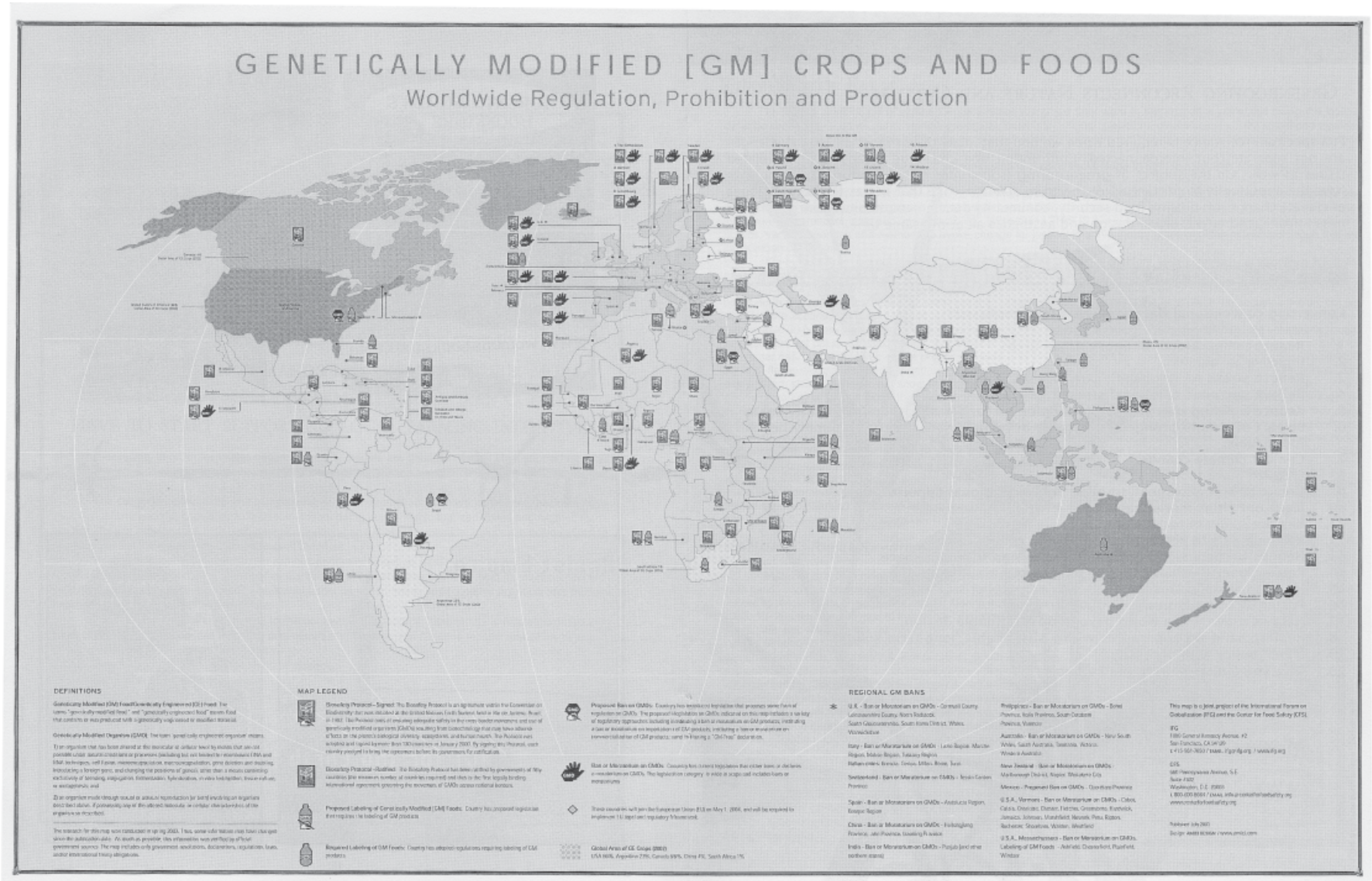
Yet biotech lobbyists like Graham Brookes and Peter Barfoot manipulate data to cover up this genocide. In a recent visit to India Brookes claimed Indian farmers had gained by Rs. 5 billion by having cost saving of Rs. 2000 per hectare. In reality, farmers had an additional burden of Rs. 2250 per acre or Rs. 7625 per acre.

This implies losses of over Rs. 10 billion. This is why the governments of Andhra Pradesh and Gujarat have taken Monsanto to court. Seed supply monopolized by global corporations is a recipe for destroying biodiversity and farmers. Only four crops corn, soya, canola, cotton account for most GMO crops planted. Only two traits have been commercialized on a large scale – herbicide resistant crops and Bt. Cotton crops. Only one company – Monsanto accounts for more than 90% GM seeds sold. The Brookes and Barfoot study is not based on primary empirical data but extrapolations from false assumptions and manipulated studies. For the U.S, the lobbyists claim $66.59

Percy Schmeiser, Dr Vandana Shiva and Collins at the Canadian Parliament during Terminator on Trial


DEFEND
FOOD SOVEREIGNTY
Eric Drooker
TERMINATE
TERMINATOR
www.etcgroup.org


A Short History of Case-by-Case Risk Assessment
Pesticide - to solve pest problems but kills farmers. Produced by: Monsanto, DuPont, Syngenta.
GE seeds - to solve pesticide problems but gene flow contaminates fields. Produced by: Monsanto, DuPont, Syngenta.
Terminator seeds - to solve GE contamination but kills farmers. Patented by: Monsanto, DuPont, Syngenta, D&PL, US Gov't.


GENETICALLY MODIFIED [GM] CROPS AND FOODS
Worldwide Regulation, Prohibition and Production
DEFINITIONS
MAP LEGEND
REGIONAL GM BANS

per ha of additional benefits for Herbicide Resistant Cotton. Yet 90 Texas cotton farmers have sued Monsanto claiming they suffered widespread crop losses because Monsanto failed to warn of a defect in its genetically engineered cotton. The lawsuit seeks an injunction against what it calls a "longstanding campaign of deception" (The Hindu Business Line, February 26, 2006, p.4 "Cotton Farmers Sue Monsanto")

With the attempt to introduce Terminator Technology, the vulnerability of our farmers and the threat to biodiversity will increase. When the "Working Group on Article 8(j)" of the Convention on Biological Diversity met in Granada in January, the United States Government falsely claimed that Terminator, which creates sterility, would "increase productivity". Indigenous people view the Terminator a treat to their freedom and sovereignty. As Mariana Marcos Tarine of Brazil stated on behalf of the International Indigenous Forum on Biodiversity "Terminator poses a threat to our welfare and food sovereignty and constitutes a violation of our human right to self determination".

And it is not just the freedom of indigenous people to save seed and protect their biological diversity and cultural diversity that is at stake. The ruling of the WTO-GMO dispute threatens the seed and food freedom of all people. When the dispute was initiated by President Bush, in 2003 we started a world wide campaigns. At the WTO Ministerial Jose Bove and Dr Vandana Shiva handed over 60 million signatures to WTO declaring that freedom from GMO's was intrinsic to our fundamental freedoms as people to choose the crops we grow and the foods we eat. We will not be enslaved by the gene giants. We will not allow their homicidal seeds to kill our farmers and our freedoms. We will continue to save our seeds as a duty to creation and our communities.

What is Terminator?

Terminator technology refers to plants that have been genetically modified to render sterile seeds at harvest. Terminator Technology was initially developed by the multinational seeds/agrochemical industry and the US government to prevent farmers from replanting harvest seed and to maximize seed industry profits. Terminator has not yet been commercialized or field-tested – although trials are currently being conducted in greenhouses in the US.

Genetic Use Restriction Technology (GURTs) is the "official" term used by the United Nations and the scientific community to refer to Terminator. Genetic Use Restriction Technology is a broad term that refers to the external chemical inducer to control the expression of a plants' genetic trait. GURTs is often used as a synonym for genetic seed sterilization or Terminator technology.

Why is Terminator a Problem?

Over 1.4 billion people, primarily small scale farming families in the developing world, depend on farm saved seed as their primary seed source. Terminator seeds will force dependence on external practices as well as the age-old practice of farmer selection and breeding – the foundation for local seed security.

If Terminator is commercialized, seed sterility will likely to be incorporated in all genetically modified plants. That's because seed sterility secures a much stronger monopoly than patens; unlike patents, there is no expiration date and no need for lawyers.

Who Holds Patents on Terminator?

The US Department of Agriculture and Delta and Pine Land, the world's 11th largest seed company, jointly hold three patents on Terminator technology. Syngenta, DuPont, BASF and Monsanto are among the other multinational

companies that have won patents. Syngenta won its most recent US patent on Terminator Technology in March 2004. A Delta and Pine Land representative is now traveling worldwide to promote his company's Terminator technology.

Will Terminator Stop Genetic Contamination?

The multinational seed industry is waging a public relations campaign to promote Terminator technology as a mechanism for containing unwanted gene flow from genetically modified (GM) plants (particularly from new products being developed like GM trees and plants modified to produce drugs and industrial chemicals). Industry argues that that engineered sterility offers a built-in safety feature for GM plants because if genes from a Terminator crop cross-pollinate with related plants nearby, the seed produced from unwanted pollination will be sterile – it will not germinate. Escaped gene from GM plants are causing genetic contamination and pose threats to agricultural biodiversity and the livelihoods of farmers – especially in centres of crop genetic diversity. For example, studies confirm that DNA from GM maize has contaminated traditional maize grown by indigenous farmers in Mexico. But Terminator technology is complex and is unlikely to ever by 100% effective or reliable – many biological events could sabotage Terminator and result in some fertile seeds.

The very companies whose GM seeds are causing unwanted contamination are now suggesting that society accept a new and unreliable technology to contain genetic pollution.

What Impact will Terminator Seeds have on Peasants and Small Scale Farmers?

Genetically modified Terminator seeds are not relevant to the needs of small scale farmers, but that does not mean farmers will not find Terminator genes and seeds in their fields if they are commercialized. If imported grain contains Terminator genes and farmers unknowingly plant is as seed, it would not germinate. Similarly, farmers who depend on humanitarian food aid risk devastating crop loss if they unknowingly use food aid grains containing Terminator gene as seed. Through pollen movement, Terminator genes can also contaminate other (open pollinated) plants nearby in the first generation.

We will spread GMO free zones as zones of our biodiversity and food freedom.
We will spread seeds of life and stop the spread of seeds of death.

GMO Trials in India

Brinjal

Trait	*Gene Inserted*	*Institution*
Resistance to diseases	Chitinase, glucanase and thaumatin encoding genes	Delhi University, South Campus, New Delhi
Resistance to lepidopteron in pests.	Bt.Cry 1 A(b)	Indian Agricultural Research Institute, New Delhi
Resistance to lepidopteron pests	Cry 1 A(b)	Proagro PGS
Resistance to insects		Tamil Nadu Agricultural University, Coimbatore
Resistance to fruit and shoot borer	Cry 1 A(c) 1/	Maharashtra Hybrid Seeds Company, Mumbai

Cotton

Trait	*Gene Inserted*	*Institution*
Resistance to lepidopteron in pests.	Bt.Cry gene	Central Institute of Cotton Research, Nagpur
Resistance to spodopotera litura and Heliothisis Armigera	Cry 1 E and Cry 1C with terminal altered at C end	National Botanical Research Institute, Lucknow
Resistance to lepidopteron pests	Cry 1 A(c)	Ankur Seeds Ltd., Nagpur
Resistance to lepidopteron pests	Cry 1A (c)	MAHYCO, Mumbai
Resistance to herbicide glyphosate	CP4 EPSPS	MAHYCO, Mumbai
Resistance to lepidopteron pests	CryX gene	MAHYCO, Mumbai
Resistance to lepidopteron pests	Cry 1 A(c)/1 /4	Raasi Seeds Limited, Attur
Resistance to lepidopteron pests	*Vip*- 3 Gene/1	Syngenta India Ltd, Pune
Resistance to lepidopteron pests Co. Mumbai	Cry 2 A (b) 1/	Maharashtra Hybrid Seeds
Resistance to insects Science, Dharwad		University of Agricultural
Resistance to insects		JK Agri Genetics
Resistance to insects		Nath Seeds
Resistance to insects		Nuzivaedu Seeds
Resistance to insects		Mahendra Hybrid Seeds
Resistance to insects		Tulsi Seeds
Resistance to insects		Ganga Kaveri
Resistance to insects		Vikki's Agrotech
Resistance to insects		Pravardhan Seeds
Resistance to insects		Prabhat Agri Biotech
Resistance to insects		Ajeet Seeds
Resistance to insects		Krishidan Seeds
Resistance to lepidopteron pests	Cry 1 A (c)	International Centre for Genetic Engineering and Biotechnology, Delhi

Cabbage

Trait	*Gene Inserted*	*Institution*
Resistant to P. Schylostella	Bt. Cry 1 A (b)	Indian Agricultural Research Institute, Delhi
Resistance to insects		MAHYCO
Resistance to lepidopteron pests	Cry 1 H/cry 9C	Proagro PGS (India) Ltd. Gurgaon

Blackgram

Trait	*Gene Inserted*	*Institution*
Resistance against Yello Mosaic Virus	Coat protein and replicase genes of Vigna mungo Yellow mosaic virus	Madurai Kamaraj University, Madurai
Insect resistance and herbicide tolerance	Dianthin and Barnase gene 2/	Madurai Kamaraj University, Madurai

Brassica/Mustard

Trait	*Gene Inserted*	*Institution*
High levels of b-carotene	Ssu-maize psy and Ssu-tpCrtl gene	Tata Energy Research Institute
Herbicide/weedicide tolerance	CP4 EPSPS	MAHYCO, Mumbai
Superior hybrid cultivars	Bar, barnase, barstar	Proagro PGS(India) Ltd Gurgaon
Stress tolerant plants	Atabidopsis annexin gene	Indian Agricultural Research Institute, New Delhi National Research Centre on Weed Sciences, Jabalpur
Abiotic Stress Tolerance	Choline dehydrogenase	Indian Agricultural Research Institute, New Delhi
Herbicide tolerance. Male sterile lines for hybrid seed production	Bar, barnase, barstar	Delhi University, South Campus, New Delhi

Cauliflower

Trait	*Gene Inserted*	*Institution*
Resistance to Plutella scylostella	Bt.Cry 1 A(b)	Indian Agricultural Research Institute, New Delhi
Resistance to insects		MAHYCO
Superior hybrid cultivars	Bar, barnase barstar	Proagro PGS (India) Ltd Gurgaon
Resistance to lepidopteron pests	Cry 1 H/cry9C	Proagro PGS

Groundnut

Trait	*Gene Inserted*	*Institution*
Resistance to Indian peanut clumpy virus	IPC Vep: 1PCV Replicase gene	International Crops Research Institute for Semi-Arid Topics-Hyderabad

Muskmelon

Trait	*Gene Inserted*	*Institution*
Edible Vaccines	Rabies glycoprotein gene	Indian Institute of Horticulture Research, Bangalore
Edible vaccines	Rabies glycoprotein gene	University of Agricultural Sciences, Bangalore

Okra

Trait	*Gene Inserted*	*Institution*
Resistance over insects		MAHYCO

Pigeon Pea

Trait	*Gene Inserted*	*Institution*
For transformation work	GUS gene	MAHYCO, Mumbai
Resistance over fungus		ICRISAT, Hyderabad
Resistance over bollworms and aphids	Protease inhibitor and lectin gene	Indian Agricultural Research Institute, New Delhi

Potato

Trait	*Gene Inserted*	*Institution*
Resistance to lepidopteron pests	Bt.Cry 1 A(b)	Central Potato Research Institute, Simla
Control fruit ripening	ACC Synthase	Indian Agricultural Research Institute, New Delhi
Resistance over insects/nutritional enhancement		National Centre for Plant Genome Research, New Delhi
Nutritionally enriched plants	Ama-1*	Jawaharlal Nehru University, New Delhi

Rice

Trait	*Gene Inserted*	*Institution*
Resistance to lepidopteron pests	Bt.Toxin 2/	SPIC Foundation, Chennai
Resistance to lepidopteron pests	Bt. Toxin 2/	Bose Institute Kolkata
N.A		Osmania University
Resistance to lepidopteron pests	Bt. Toxin 2/ (Bt. Cry 1 A (b)	IARI Substation, Shillong
Resistance to lepidopteron pests	Bt. Toxin 2/	International Centre for Genetic Engineering and Biotechnology, Delhi
Stress tolerance	S-adenosylmethionine	Bose Institute, Kolkata
Herbicide Tolerance	Herbicide tolerant gene 2/ (bar gene)	Centre for Cellular and molecular biology, Hyderabad
Resistance to lepidopteron pests	Pyruvate Carboxylase and Alcohol Dehydrogenase gene	Delhi University
To generate plant resistant to lepidopteron pests	Xza 21, Cry 1 A (b)	Directorate of Rice Research, Hyderabad
Resistance to Bacterial and fungal diseases	BB and SB Resistant gene	Directorate of Rice Research, Hyderabad
Resistance to lepidopteron pests	Bt and Chitinase gene 1/	IARI, Delhi

Resistance to gall midge	Gm2 gene 2/	International Centre for Genetic Engineering and Biotechnology, Delhi
Resistance to fungal infection	Chitinase, Beta – 1, 3- Glucanase and Osmotin Gene 2/	Madurai Kamaraj University, Madurai
Tolerance to abiotic stresses	Maize Transposable Element 2/	Spic Foundation, Chennai
N.A.		M.S. Swaminathan Research Foundation, Chennai
Resistance to lepidopteron pests	Cry 1 A (b) 2/	Narendra Dev University of Agriculture, Faizabad
Resistance to pests	GNA Gene 2/	Tamil Nadu Agricultural University, Coimbatore
Resistance against yellow stem borer	Cry 1 Ab (Pusa Basmati)	Punjab Agricultural University, Ludhiana
Resistance against yellow stem borer	Cry 1 Ac (Pusa Basmati)	Punjab Agricultural University, Ludhiana
Resistance against biotic and abiotic stresses	Cod A, cor 47 (Pusa Basmati)	Delhi University
Resistance to lepidopteron pests and herbicide tolerance	Cry 1 A (b), Cry 9 C, bar	Hybrid Rice International, Gurgaon
Resistance to lepidopteron pests, bacterial blight and sucking pests	Cry 1 A (c), Xa21, and GNA genes	MAHYCO, Mumbai
Resistance over bacterial blight	Xa-21	MAHYCO, Hyderabad

Sorghum

Trait	*Gene Inserted*	*Institution*
Resistance to lepidopteron pests	Cry 1 A(c) 2/	Maharashtra Hybrid Seeds Company, Mumbai

Sugarcane

Trait	*Gene Inserted*	*Institution*

Sunflower

Tobacco

Trait	*Gene Inserted*	*Institution*
Helicoverpa Armigera	Bt. Cry 1 A (b)	Central Tobacco Research Institute, Rajahmundry
Spodotera litura	Cy 1 C	Central Tobacco Research Institute, Rajahmundry
Resistant to fungal attack	Chitinase glucanase and RIP	Indian Agricultural Research Institute, New Delhi
Resistant to Spodoptera litura	Bt. Cry 11a5	International Centre for Genetic Engineering and Biotechnology, New Delhi

Edible Vaccines	Ctx-B and tep genes – Antigens of *vibrio cholerae 2/*	Delhi University, Delhi

Tomato

Trait	*Gene Inserted*	*Institution*
Resistance to fungal diseases	Chitinase and glucanase	Indian Institute of Horticulture Research, Bangalore
Insect/fungal/ viral resistance; N.A.		NCPGR, New Delhi
Insect/fungal/viral resistance: N.A		MAHYCO
Resistant to leaf curl virus	Reporter/Leaf Curl Virus gene	Indian Institute of Horticulture Research, Bangalore
Resistance to fungal infection	OXDC	Jawaharlal Nehru University, New Delhi
Resistance to fungal attacks	Alfalfa glucanase gene	Indo-American Hybrid Seeds, Bangalore
Resistance to viral attacks	Tomato leaf curl Virus gene	Indo-American Hybrid Seeds, Bangalore
Resistance to lepidopteron pests	Cry 1 A (b)	Proagro PGS (India) Ltd, Gurgaon
Edible Vaccine Development	Tomato Ctx- B and tep antigens of Vibrio Cholerae	Delhi University, South Campus, New Delhi
Resistant to lepidopteron pests	Bt. Cry 1 A (b)	IARI, New Delhi
Control fruit ripening	ACC Synthase	IARI, New Delhi
Resistance to lepidopteron pests	Snowdrop Lectin gene	Rallis India Ltd. Bangalore

Watermelon

Trait	*Gene Inserted*	*Institution*
Transformation studies	GUS and GFP gene 2/	Indian Institute of Horticultural Research, Bangalore

Wheat

Trait	*Gene Inserted*	*Institution*
Resistance against biotic and abiotic stresses	Bar, HVA1, PIN2	Delhi University, South Campus, New Delhi

Coffee

Trait	*Gene Inserted*	*Institution*
Resistance to fungal diseases	Chitinase, Beta-1, 3-glucanase and osmotin gene 2/	Madurai Kamaraj University, Madurai

Banana

Trait	*Gene Inserted*	*Institution*
Increase stress tolerance or control fruit ripening	ACC Synthase	Indian Agricultural Research Institute, New Delhi

Chilli

Trait	*Gene Inserted*	*Institution*
Resistance to lepidopteron pests	Snowdrop lectin gene 2/	Rallis India Ltd. Bangalore

Bell Pepper

Trait	*Gene Inserted*	*Institution*
Resistance to lepidopteron pests	Gene inserted	Rallis India Ltd, Bangalore

Pea

Trait	*Gene Inserted*	*Institution*
Transformation studies	GFP gene 2/	Indian Institute of Horticultural Research, Bangalore

Maize

Trait	*Gene Inserted*	*Institution*
Resistance to lepidopteron pests	Cry 1 A (b) 2/	Syngenta India Ltd Pune
Herbicide tolerant plant	CP4EPSPS 2/	Monsanto Enterprises Ltd, Mumbai
Resistant to lepidopteron pests	Cry 1 A (b)	MAHYCO, Mumbai

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CHAPTER II

Farmers Indebtedness and Suicides

Globalisation, privatisation and liberalization since 1995 overseen by World Bank and World Trade Organisation (WTO) is ruining Indian Agriculture. Farmers have been left at the mercy of profiteers mainly Multinational Corporations (MNCs) controlling seeds, chemical processing and trade. It is now recognized that Indian Agriculture is in a state of crisis. There are numerous indicators of this crisis; farmers indebtedness and suicides, the stagnation of agricultural domestic product (GDP), the fall in per capita GDP in agriculture, the increased volatility of the output, greater susceptibility of Indian prices to international price movement and the rising costs of production.

The agrarian crisis that has spread through rural India for the past few years has been associated very clearly with the rising burden of indebtedness among farmers.

The inability to repay past debt – and therefore to access fresh loans – has been widely accepted as the most significant proximate cause of the farmers' suicides that were so widespread in Andhra Pradesh and Karnataka, and are apparently continuing in areas as far apart as Wayanad in Kerala, Vidarbha in Maharashtra and some areas of Punjab and Rajasthan.

The large number of suicides have suggested that the decline in access to institutional credit has driven more farmers back to potentially more exploitative usurious relations with traditional moneylenders or input dealers.

Repayment problems, resulting from the greater difficulties of cultivation because of rising input prices and volatile output prices, have been compounded by the higher interest rates charged by these informal sources.

The recent report of the National Sample Survey, based on the 59th Round is particularly important, since it provides the first systematic evidence since 1992, on the causes, extent and sources of farmer's debt. The extent of farmer's indebtedness emerges as very substantial. As Table 2.1 indicates, nearly half (48.6 per cent) of the farmer households were reported to be indebted.

The incidence of indebtedness was highest in Andhra Pradesh, where more than four-fifths of surveyed farmers were in debt, followed by Tamil Nadu with nearly three fourths of farm households reporting, indebtedness. In Punjab, Kerala and Karnataka the proportion was nearly two-thirds, and in Maharashtra, Haryana, Rajasthan, Gujarat, Madhya Pradesh and West Bengal more than half of the farmers surveyed were in debt.

At on all India level, the survey has held that there are 147.90 million rural house holds, out of which 89.35 million are farmers house holds. Out of an estimated 43.4 million indebted farmers house holds, 6.9 million belonged to Uttar Pradesh, 4.9 million to Andhra Pradesh, 3.6 million to Maharashtra, 3.5 million to West Bengal and 3.2 million to Madhya Pradesh. (Business Line 2005)

It is worth nothing that some of the State where the agrarian distress is reported to be especially severe, such as Andhra Pradesh, Karnataka, Maharashtra, Punjab and Rajasthan, are also those which report high levels of indebtedness. (Ghosh and Chandrasekar 2005).

As shown in Table 2.2 the two most important purposes of taking loans were stated to be "capital expenditure in farm business" and "current expenditure in farm business". At the all-India level, out of every 1000 rupees taken as loan, 584 rupees had been borrowed for these two purposes taken together. The highest such proportion was in Maharashtra, where 75.4 per cent of loans were taken for the purposes of productive investment of farms, followed by Karnataka with 68.2 per cent. In Punjab, Andhra Pradesh and Uttar Pradesh the proportion exceeded 60 per cent of the total amount of loans. Such loans have been difficult to repay because of changes in production conditions, leading to a vicious cycle of indebtedness. So cultivation itself has become less economically viable over time. The next important purpose of taking loans was for spending on "marriages and ceremonies", which however accounted for a much smaller proportion of total loans, at around 11 per cent. This purpose was most important for farmer households of Bihar (22.9 per cent) followed by those in Rajasthan (17.6 per cent). (Ghosh and Chandrasekhar 2005)

A worrying aspect that emerges is the significance of pure consumption loans – these accounted for 8.8 per cent of all amounts borrowed by farmers at the all-India level, and as much as 13.8 per cent in

TABLE 2.1
Percent of Farmers Indebted

State	***Percentage of Farmers Indebted***
Andhra Pradesh	82.0
Bihar	33.0
Chhattisgarh	40.2
Gujarat	51.9
Haryana	53.1
Jharkhand	20.9
Karnataka	61.6
Kerala	64.4
Madhya Pradesh	50.8
Maharashtra	54.8
Orissa	47.8
Punjab	65.4
Rajasthan	52.4
Tamil Nadu	74.5
Uttar Pradesh	40.3
West Bengal	50.1
Jammu & Kashmir	31.8
Himachal Pradesh	33.4
Assam	18.1
All India	**48.6**
(NSSO, 59th Round)	

TABLE 2.2
Farmer's Debt by Purpose of Loan, All-India

Item	***Percent***
Capital expenditure for farm business	30.6
Current expenditure for farm business	27.8
Expenditure for non-farm business	8.8
Marriages & ceremonies	11.1
Education	0.8
Others	21
(NSSO, 59th Round)	

Ghosh, Jayati and C.P. Chandersekar, 2005, "The Burden of Farmers Debt" Business Line, 30 August 2005, New Delhi.

Business Line 2005, "50 Percent of Farm House Holds Indebted" Businessline, 4th May, 2005 New Delhi.

NSSO, 2005, "Indebtedness of Farmers House Holds" 59th Round Survey, National Sample Survey Organisation, 2005 New Delhi.

Rajasthan. The persistence of such consumption loans is a sad comment indeed on the viability of cultivation, and on the lack of progress in improving basic survival conditions of agriculturalist families.

A question of great interest relates to the source of loans. The basic purpose of bank nationalization and the focus on agricultural credit co-operatives was to extend the reach of institutional credit, so as to weaken the stranglehold of traditional moneylenders and, thereby, ease the credit conditions facing ordinary peasants. However, financial liberalization policies from 1992 have led to the progressive weakening of "priority" lending to agriculture and a substantial decline in the extension of institutional credit to cultivators per capita or in terms of production costs.

TABLE 2.3
Percent of Indebted Farmers Taking Loans from Different Sources

Moneylenders	29
Banks	27
Co-operative society	26
Relatives & friends	18
Traders	12
Government	3
Others	5

The percentage numbers in this Table add up to more than 100, since farmers may access more than one source of loan. (NSSO, 59th Round)

The consequence of this is evident in Table 2.3, from which it is clear that moneylenders and traders emerged as the most significant source of credit for farmers, with 41 per cent accessing these sources.

According to NSSO (59th Round), an Indian farmers house hold has an average debt of Rs. 12,585. The Punjab farmer tops the list with Rs. 41,575, followed by Kerala with Rs. 33,907, Haryana Rs. 26,007, Andhra Rs. 23,965 and Tamil Nadu Rs. 23,963.

TABLE 2.4
Farmer's Indebtedness by Size of Land Possessed

Size of land holding (in hectares)	***Percent of farmers***	***Average loan outstanding (in Rs.)***
Less than 0.01	45.3	6121
0.01 – 0.4	44.4	6545
0.4 – 1.0	45.6	8623
1.01 – 2.0	51	13762
2.01 – 4.0	58.2	23456
4.0 – 10.0	65.1	42532
More than 10	66.4	76232
All	48.6	12585
(NSSO, 59th Round)		

The other striking feature that emerges from the survey is how widespread indebtedness is across size classes of farmers. The Table 2.4 indicates, that the average amount of the outstanding loan increases with the size of the loan holding, but what is more interesting is that the proportion of indebted farmers also increases with the size class. Clearly, the rural debt situation is grim and requires an urgent policy intervention.

According to Christian Aid; a British Charity Organisation, privatisation in Andhra Pradesh had contributed to more than 4500 farmers suicides. The abetment to suicide came from the privatisation policies of the State government paid for by the Department for International Development (DFID) of the British Government. The State government set up an Implementation Secretariat to reform the State enterprise which effectively meant to cut them or privatise them. For this task Indian bureaucrats were not considered competent. For the privatisation process, DFID gave 3.1 million dollars and contracted it out to a London Firm 'Adam Smith International" (ASI). The privatisation of State enterprises resulted in the loss of 45000 jobs. (Suri 2005)

Suri, Sanjay 2005, "Stains of Blood," Outlook, 6th June, 2005 New Delhi.

Organization like Andhra Pradesh Seed Development Corporation restructured so much that it became almost non-existent. Many of the organizations now privatised or shut down, were a life line that poor farmers relied on. At time of crisis they had atleast this support system to go to, to get help on seeds, water and this was cut from under their feet by Implementation Secretariat and ASI financed by DFID and this caused a crisis of debt which spiraled into a crisis of suicides.

In one phase, 19 state-run enterprises went down. Several corporations such as the Small Scale Industries Development Corporation, the State Agro Development Corporation, the AP Meat Development Corporation and the AP State Irrigation Development Corporation were all closed. By the end of it 43 state-run enterprises had bitten the dust. Many of these had provided valuable support to the small-scale farmer.

But the most significant was the restructuring of the Andhra Pradesh State Seeds Development Corporation. When it was allowed to function properly, the Seed Corporation served as a vital regulatory mechanism for the whole seed market, It helped to maintain prices and the quality of seeds. The quality crashed and the prices soared after it was restructured so severely that it became ineffective. The Indian Council of Agricultural Research had said in 2000 that this corporation is recognized as one of the better-managed Seed enterprises in the country.

Indian Farmers - A Harvest of Misery

- In the last decade, over 40,000 farmers have killed themselves, trapped in a vicious cycle of debt, crop failure and penury, however Government estimate puts the figure just about 9,000; Karnatka with 5910 followed by Andhra Pradesh 1835, Maharashtra 981 and Kerala 201 since 2001.
- Nearly half of Indian farmers are gripped by debt. 82 per cent of Andhra's farmer households are indebted; it's 74-5 per cent in the case of Tamil Nadu.
- While agricultural incomes are rising by only 1.5 per cent, consumption expenditure is going up by almost 4 per cent.
- The total short-term credit required for crops is about Rs. 1 lakh crore a year. Financial institutions supply only 12-14 per cent of this.
- The share of long-term credit to agriculture declined from over 20 per cent in the 1970s to 15 per cent in the 1980s, and to 12 per cent in the 1990s.
- From 16.4 per cent in 1979-80, plan outlay for agriculture slumped to 6 per cent in the 1980s, and to 4.9 per cent in the ninth plan (1997-2002).

Shockingly, reform programme in Andhra Pradesh was rated the best reform project in South Asia by the World Bank. The last Andhra government, it said, set out on a ambitious programme "to reduce the State's dependency upon agriculture and foster in its place an efficient high-tech economy together with a modernized civil service." State-run enterprises had deteriorated to become a burden on the state, and ASI supported the implementation Secretariat "in evaluating which enterprises needed to be restructured, which needed to be privatised and which need to be closed.

In September 2004, the new government in the State set up a Commission to look into the agricultural crisis which was chaired by Prof. Jayati Ghosh of Jawaharlal Nehru University.

The Commission, found many areas which were a major failure in public policy, almost all of which were related to the nature of State intervention. Many of the systems that protected farmers earlier had been dismantled. In all these areas where the State had previously played some role in providing protection, those forms of protection have been removed, farmer have been exposed to international competition, and yet domestic input prices were rising and they were unable to cope.

What was called Aid became a joke in Andhra Pradesh. In many rural areas of Andhra Pradesh, Aid is seen as an instrument to beat the poor. They really see it as the government taking some kind of loan and then using it as an excuse to carry out all kinds of anti farmer, anti people policies because they have been told to implement these as conditions for Aid.

And yet, even after the formation of new government the cases of suicide continued-about seven a day till June – July 2004. This is not surprising many earlier cases were not recorded as such farmers were required to pay Rs. 5000 for an a autopsy and the police discouraged many families from reporting suicides. (Suri 2005)

Normally April-May witnesses more farmer suicides because it is then that farmers learn about the fate of crop. In these months, debtors including banks tighten screws for repayment. The summer is also for marriages and family events. That put additional pressure on the peasants. Out side work also dries up in summer, making it desperate for farmers. Government has little control over the unregulated moneylenders on whom a majority of small farmers are dependent on. They storm into the villages and abuse the farmers and humiliate them in a very foul language before their family and neighbours. They even harass them by setting their goons on them. (Chaudhary 2004)

Andhra Pradesh has been witnessing suicides since mid 1990s. First it was the cotton growers of Telangana who suffered successive crop failures. Then came the turn of Chilli and Tobacco growers. Some even sold their kidneys in Mumbai and Delhi for Rs. 50000 to Rs. 1,00,000 to repay their debts. Then there were the suicides of the Anantpur ground nut farmers. (Farooq 2004)

The suicides reflect a deeper malady. This crisis did not come over night. The Central and State government's policies for the past last two-three decades with little investment in agriculture, reduced farmers to the position of raw material producers. The plight of the farmers was compounded by nationalized banks denying farmers credit and hounding them into the hands of private money lenders.

The notion of a credit card for farmers has always been the butt of jokes but it takes on a particularly ironical twist in the case of Andhra Pradesh. According to official sources, a total of 56.63 lakh Kisan Credit Cards have been issued in the State until March end of 2004. The total amount outstanding of these cards Rs. 9,826 crores, implying that each card has an outstanding amount of Rs. 17,350. It is obvious that the distribution of credit from schemes such as these is extremely skewed in favour of rich farmers. Not a single family of suicide victims ever saw anything resembling the Kisan Credit Card. Andhra Pradesh is one of the leading states in the matter of issuing Kisan Credit Cards accounting for about 15 percent the cards issued in the country.

According to Prof. Ajay Dandekar of the Tata Institute of Social Sciences (TISS) who headed the study on farmer suicides in Maharashtra at the request of the High Court of the State, "The chasm is huge. The total short-term credit required for crops in India (crop loans) is about Rs. 1 lakh crore a year. But

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Chaudhary, Savitri 2004, "Till Debt Do us Apart" Outlook, 7th June 2004, New Delhi.

Farooq, Omer 2004 "Bitter Harvest, Pioneer, 13th June, 2004 New Delhi.

financial institutions supply only 12-14 per cent of this." And this credit comes with strings attached. A defaulter, even for natural reasons like crop failure, never gets another loan. Even kisan credit cards, which have a limit of Rs. 5,000 per acre, are not reusable unless the borrower has repaid the first loan in part/ full. (Shastri 2005)

The liberalized polices, which are geared more towards creating a pan-Indian primary commodity market with a unified price, in alignment with global price, which is based on subsidies, have clearly worked against farmers in the State. The farmer in Warangal district, for instance was cajoled into producing cotton by the State more than a decade ago. Prof. Sudharshan Reddy, who participated in an inquiry into the suicides by farmers in the district said that the State encouraged the farmer to grow cotton but has since then left them in lurch. The State did this despite the soil condition being unsuitable for cotton cultivation. It should not come as a surprise that more than 600 farmers have committed suicides in Warangal in last five years. (Sridhar 2004)

Rising cost of cultivation have meant that the cost of production of paddy in Andhra Pradesh is higher by about 16 percent when compared to the cost in Punjab; the cost of growing cotton is higher by more than one third when compared to that in Gujarat, and the cost of groundnut production is 38 percent higher in the State when compared to that in Gujarat.

More over tenant cultivators with little or no land pay exorbitant rents to the landlords. High rent charged by the absentee landlords in coastal Andhra Pradesh, amounting to more than half the annual produce of the farmers, is a serious burden on the peasantry. The rising cost of cultivation, coupled with the risks associated with it, has not only added to the burden on the peasantry but made life uncertain for the poor peasant. The tenant's plight is worse because, apart from the rack renting by the landlords, he is also totally outside the loop of the formal credit mechanism. (Sridhar 2004)

The absence of dependable irrigation facilities has also made farmers in the dry areas more dependent on ground water. Unaware that lack of rains have depressed the groundwater table, frenzied farmers dug one borewell after another. In some cases, the farmers dug 11 of them. Even if a farmer was lucky to find water the high power tariff brought him down. (Farooq 2004)

The decline in agriculture began in the '80s, coinciding with the IMF loan. From 16.4 per cent in 1979-80, plan outlay in agriculture and allied activities slumped to 4.9 per cent in the Ninth Plan (1997-2002), making farming, always the most privatised, independent business, a totally support less venture in these liberalized, globalised times.

The two-volume Rajasthan 10th plan document contains just a para on drought-proofing. Imagine this in a State where oilseeds and bajra, both rainfed crops, are staple." West Bengal, which took pride in its land redistribution of the '80s, is now reporting starvation deaths. Kerala is under NHRC pressure to investigate farmer deaths. Even Karnataka is reporting suicides. Banks now

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Shastri, Paromita 2005, "Indian Farmers: A Harvest of Misery" Outlook 4th July, 2005 New Delhi.

Sridhar, V 2004, "An Agrarian Tragedy" Frontline, 3rd July 2004, New Delhi.

treat infotech as a priority sector, while farmers borrow and toil their way to disaster not having recourse, like industrialists, to debt recovery acts or insolvency declaration.

These suicides, the desperate acts of self destruction continue unabated. New centre of crisis have emerged in Karnataka, while nearly 1,300 suicides have been recorded in Kerala in Wayanad district alone. International bodies project continue fall in real prices of primary products upto 2010, so there is no solace in trying to access external markets. The cornering of purchases of tea, coffee and spices by MNCs, following the downgrading of State marketing boards, has driven producers prices to levels far below global prices. (Patnaik 2005)

The process of trade liberalization has meant that domestic agricultural prices have less relation to domestic demand and supply condition and instead follow world prices. This means that even when the harvest is lower or there are crop failures, cultivators do not get any recompense in terms of higher prices. (Ghosh 2003)

As far back as the 7th plan, 1985-90 when Rajiv Gandhi was the Prime Minister, the average share of rural development expenditure in Net National Product (NNP) had been raised to 4 percent, with the very positive effects by way of rising employment and rising real wages. The rural development expenditure include five heads – agriculture, rural development, irrigation and flood control, special areas programme, village and small scale industry. It might interest to Sonia Gandhi to know that in the first year of UPA rule, rural development expenditure taking these same heads have been slashed to an all time low of 0.6 percent of NNP. The absolute outlay (budgetary estimate) was a party Rs. 13.5 thousand crores, and the sum is actually the same, even without any adjustments for price, as that spent under Rajiv Gandhi 15 years ago. (Patnaik 2005)

Crop Failure and Price Crash : A Trigger for Suicides

Notwithstanding the Maharashtra government's preoccupation with dance bars, liquor liberalization and private lake city-townships around Pune, the severe distress and suicides by farmers in Vidarbha should not to come as a surprise to anyone. (Vaidya 2006)

The Situational Assessment Survey (SAS) revealed that while the incidence of indebtedness among farmers in Maharashtra rose from 29% of households in 2001 to 88.97% in 2003, the extent of indebtedness per household (debt in rupees per household at 1986-87 prices) rose by 232% in this period.

In 2003, Maharashtra along with Andhra Pradesh, West Bengal, Uttar Pradesh and seven other states showed a negative net income of farmer

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Patnaik, Utsa 2005, "It is Time For Kumbhakarana to Wake up" Hindu, 5th August 2005, New Delhi.

Ghosh, Jayati 2003, "Whatever Happened to Farm Employment" Frontline, 23rd May 2003, Chennai.

Vaidya, Abhay 2006, "The Seeds of Farmers Suicides; Death Keeping Pace with Rising Indebtedness, and Crop Failure, Price Crash Act as a Triggers," 14th April 2006, Times of India, New Delhi.

households, as their annual total income was less than their annual consumption expenditure. The average annual profit from cultivation in Maharashtra was barely Rs 4,363 against an average of Rs 22,770 in Jammu and Kashmir-the highest in the country. At an all-India level too, the net income of farmers was negative as the annual total income (Rs 25,380) was less than the annual consumption expenditure of Rs 33,240.

The lowest net income of farmers was in Rajasthan, followed by Uttar Pradesh.

This clearly suggests that farmers are in severe distress and the income that they get from all sources is not enough to meet the consumption expenditure of the households.

Every time a cotton crop fails or commodity prices crash, as in the case of cotton, farmers' suicides start hitting the headlines, leading to the single-point assumption that suicides result from rising agricultural indebtedness. However, studies by the Gokhale Institute of Politics and Economics (GIPE) have shown that this factor has been acting only as a "trigger" for a complex range of socio-economic factors that lead to suicides.

No suicide happens because of a single event. It results from a combination of stress factors, which culminates into a trigger leading to the suicide. According to GIPE study factors such as reduction in net farm income and rising input prices in cotton cultivation have been making small farmers extremely vulnerable to suicide.

The analysis reveals that although the devastating impact of crop failure is felt by the entire farming community, those who commit suicide are drawn to do so by the additional burden of hostile sociological factors.

For example, analysis of 30 farmer suicide cases revealed that among small farmers while 36.37% committed suicide "due to loss of agricultural income and indebtedness", in the case of medium farmers, this factor amounted to 25% of suicides and in the case of large farmers, barely 14.29%.

Package to Prevent Farmers Suicides

Recently, government announced a package to prevent farmers suicides in four states where suicides are rampant i.e. Maharashtra, Karnataka, Kerala and Andhra Pradesh. Of the 30 to 35 districts where the package will be implemented, 15 are in Andhra Pradesh, 6 each in Maharashtra and Karnataka and three in Kerala, 5 more districts from Karnataka may be included later on.

Aimed at supplementing and supporting, the State Governments efforts in this direction the package would address problems relating to agriculture credit, irrigation, crop insurance, improving agriculture productivity, extension services and health insurance coverage (Hindu 2006).

Crop intensification, and diversification along with non-farm linkages and supplementary income avenues could offer a solution to the crisis that forced about 9000 farmers to commit suicides in these states since 2001.

Hindu 2006, "Package to Prevent Farmers Suicides," The Hindu, 11 April 2006, New Delhi.

Business Line 2006, "Centre Announces Modified Insurance Scheme for Farmers," Business Line, 11 April 2006, New Delhi.

Karnataka, leads the list with 5,910 followed by Andhra Pradesh with 1835, Maharashtra 981 and Kerala 201 (Business Line 2006).

The cotton growers in Vidharbha are likely to face an acute problem for getting fresh loans, despite the state government's much publicized financial package of Rs 1075 crore to bail out crisis ridden farmers in the region. Though there are 22 lakh farmers in the suicide prone region, only 60,000 cotton growers are eligible for fresh loans. According to Kishore Tiwari, convenor of Vidharbha Jan Andolan Samiti, barring the refund of the capital mobilization fund, hardly any relief had reached farmers, like the Rs 1 lakh compensation to next of kin where the deceased were not owners of land. (Maitra, 2006)

Why Farmers are Killing Themselves?

'It is in the agricultural sector that the battle for long-term economic development will be won or lost'.
(Prof. Gunnar Myrdal, Nobel Laureate)

This subtle remark of Professor Gunnar Myrdal emphasized the imperative need for agricultural progress as the basis of long-term economic development. The vast majority of poor in India is living in rural areas and engaged primarily in subsistence agriculture for survival, even today. The core problems of widespread poverty, growing inequality, rapid population growth and rising unemployment find their origin in the stagnation and often retrogression of economic life in rural areas. The economic progress, whatever, that has been allowed in India before and after independence, has bypassed millions of people. (Rudrappan 2003)

If development is to take place and become self-sustaining, really and substantially encompassing especially the poor, it will have to start in the rural areas in general and agriculture in particular. One alarming point of concern of investment pattern in agriculture is public investment. The public investment has been continuously decreasing and directly affecting agriculture negatively with less creation of infrastructure facilities. The public investment, which was 37 per cent in first plan on agriculture, has come down to 17.8 per cent in tenth plan, recording a reduction of 50 per cent in 53 years. (Singh, P.K. 2003)

Undoubtedly, there has been a little positive impact of economic reforms on agriculture sector in India and in some cases it has been showing negative trends. Compared to international standards, Indian agriculture has been witnessing slow annual growth rate even in the economic reform period, as it is clear from table 2.5.

TABLE 2.5
Growth Rate in Agriculture (1980-96)

Country	*Growth Rate in %*
China	5.86
Pakistan	4.0
USA	3.86
Thailand	3.70
Malaysia	3.39
Indonesia	3.23
India	3.10

Singh, P.K. 2003

Singh, P.K. 2003, "Reforms in the Agriculture Sector," Yojana, vol. 47, no. 11, November 2003.

Maitra, Pradeep Kumar 2006a, "Govt's Relief Package Leaves Out Most Farmers" 11 April 2006, Hindustan Times, Bombay.

Rudrappan, D. 2003, "Economic Reforms and Agriculture," Yojana, vol. 47, no. 11, November 2003.

It is quite interesting to see the changes in gross domestic production during during 1995-96 to 2002-2003. It is evident from table 2.6 that there is a marginal increase of 1.87 per cent per annum in agriculture sector as compared to industry, service and total GDP in the period of economic reforms. Of these 8 years, the agriculture growth rate in the country in 5 years remained negative or insignificant, as shown in table 2.6. The table also indicates uneven and erratic trends of growth during the period of economic reforms. A deeper examination of the underlying determinants of uneven growth conceals wide inter-crop differences in growth performance as well as in the relative contribution of area and yield changes to output growth, on which economic reforms process failed to make any positive impact. (Singh P.K. 2003)

A close look at the distribution of gross domestic production points at the negative impact of economic reform on agriculture in the country. It is clear from table 2.7 that 8.48 per cent of the increase in gross domestic production has gone to the non-farmers during the period from 1991-92 to 2001-02. The non-farmers are enjoying almost six times more GDP distribution as compared to farmers. This clearly indicates that the economic reforms have been increasing rift between farmers and non-farmers.

The investment in agriculture as per centage of gross domestic production has come to a situation of stagnation (1.3 per cent in 2001 compared to 1.6 per cent in 1993-94). The per centage share of public sector in capital formation has come down to 26.5 per cent in 2001-02 from 33.0 per cent in 1993-94 (table 2.8).

According to 2001 census, total workforce in the rural areas was 310.6 million. The total cultivators in rural areas were 124.7 million and agriculture workers in rural areas were 103.1 million. This means that out of total workforce of 310.6 million in rural areas in 2001, those working in agriculture sector either as cultivators or agriculture workers were 227.8 million or about 73.3 per cent of the rural workforce. The Work Participation Rate (WPR) for rural areas as per the census data would come to 41.96 per cent, as total rural population was 740.25 million in 2001 and the total rural workers were 310.6 million. But still the proportion of people living below poverty line in rural areas was 26.07 per cent. The reason for higher proportion of rural people living below the poverty line, in spite of the fact that a much higher proportion of them were workers, was that majority of the rural workers might not have been getting enough income, as the annual earnings of the majority of the agriculture labour in India are so low that they cannot meet even their minimum consumption needs. (Singh Jasvir 2003)

The moot question is: can a person survive even for few days without spending anything on him to sustain his life when everything required to sustain life is available at a price? Thus, there is a danger signal when the rural people living under the condition of extreme poverty and deprivation are unable to manage even the most basic requirements of life like food in adequate quantity, clothing and other daily needs, resulting in the subsistence borrowing by the rural poor and small farmers.

Singh, Jasvir 2003, A Preliminary Study of Poverty", Deprivation and Rural Indebtedness in India in the 1990s, RFSTE, New Delhi, 2003.

TABLE 2.6
Sectoral Real Growth Rates in GDP

Item	*1995-96*	*1996-97*	*1997-98*	*1998-99*	*1999-00*	*2000-01 (P)*	*2001-02 (Q)*	*2002-03 (A)*	*Average Annual Growth Rate*
Agriculture and Allied Activities	-0.9	9.6	-2.4	6.2	0.3	-0.4	5.7	-3.1	1.87
Industry	11.6	7.1	4.3	3.7	4.8	6.6	3.3	6.1	5.93
Service	10.5	7.2	9.8	8.4	10.1	5.6	6.8	7.1	8.18
Total GDP	7.3	7.8	4.8	6.5	6.1	4.4	5.6	4.4	5.86

Note: A: Advance Estimates, Q: Quick Estimates, P: Provisional.

TABLE 2.7
Share of Farmers in GDP between 1991-92 and 2001-02

Year	*GDP (Crore Rs.)*	*At Constant Prices*	
		Agriculture	*Non Agriculture*
1991-92	701863 (100%)	217577 (31%)	484286 (69%)
2001-02	1265429 (100%)	303702 (24%)	961727 (76%)
Increase	563566 (100%)	86125 (15.2%)	477441 (84.8%)
Average Increase Per Annum	-	1.52%	8.48%

Singh P.K., 2003

TABLE 2.8
Gross Capital Formation in Agriculture Sector at 1993-94 Prices

Year	*Per cent Share*		*Investment in agriculture as percentage of GDP*
	Public	*Private*	
1993-94	33.0	67.0	1.6
1994-95	33.0	67.0	1.6
1995-96	30.9	69.1	1.6
1996-97	28.9	71.1	1.5
1997-98	25.0	75.0	1.4
1998-99	26.0	74.0	1.3
1999-00	24.4	75.6	1.4
2000-01	23.5	76.5	1.3
2001-02	26.5	73.5	1.3

Economic Survey, 2002-2003

Economic Survey, Government of India, 2003 "Chapter 8 on Agriculture, The Economic Survey 2002-03, Economic Division, Ministry of Finance and Company Affairs, New Delhi, 2003.

Under these circumstances it is not a surprise that a considerable number of farmers has committed suicides in the second half of the 1990s, particularly in Karnataka, Andhra Pradesh and Punjab. The spate of suicides by farmers in Karnataka is still continuing.

Interestingly, four years ago, a British study had shown that farmers reported a lower prevalence of psychiatric morbidity than the general population, but were more likely to think that life was not worth living. Dr. Mohan Issac, a professor of psychiatry at NIMHANS – Bangalore believes that farmers' suicides are multifactored; several factors have been acting in a cumulative manner. Very often, the end comes due to losing the last straw. Farmers' leader Prof. M. D. Nanjundaswamy blames free imports, falling prices and lack of social security for farmers for this situation. He also believes that the compensation amount of Rs. one lakh for farmers committing suicide must be cancelled because it acts as an incentive. (Bhanu Tej 2003)

Failure of Institutional Delivery of Credit to Farmers

Despite the government setting a target of tripling agriculture credit to nearly Rs. 140,000 crores in four years and slashing the interest rate to nine per cent from the existing 12 to 14 per cent, farmers across the country are facing many hurdles in availing farm loans.

The difficulties in availing agriculture credit range from banks fighting shy of extending loans to the poor financial state of cooperative banks and the still high interest rates despite the rate cut. While farmers in some states are still ignorant of the availability of farm loans, some state governments have a lackluster attitude towards ensuring access to agriculture credit. A few banks say their necessity to check the mounting non-performing assets (NPAs) is coming in the way of meeting the 18 per cent credit target for agriculture. The outstanding agriculture loans of Scheduled Commercial Banks (SCBs), Rural Regional Banks (RRBs) and the Rural Electrification Corporation (REC), which are also covered under the agriculture credit category amount to over Rs. 50,000 crores.

Cooperative banks put the blame on the National Bank for Agriculture and Rural Development (NABARD), stating that it is not adequately financing them. The sharp cut in the interest rate for farm credit has come in the wake of severe criticism of banks for consistently slashing interest rates on home and car loans and extending them on easier terms while keeping the rate high for agriculture and the terms quite tough. In Uttar Pradesh, the share of income from agriculture and animal husbandry decreased from 40 per cent in 1993-94, to 34.5 per cent in 1999-2000. Against this backdrop, the recovery of agricultural dues by commercial banks declined marginally from 71.14 per cent in 2000-01 to 70.31 per cent in 2001-02, while the recovery poteof regional rural banks improved to 61.02 per cent from 58.59 per cent. However, according to NABARD, the recovery performance of cooperative credit institutions has deteriorated.

In Kerala, the risky nature of agricultural operations and the tedious process of handling a large number of loans of small amounts at frequent intervals are

Bhanu, Tej, 2003, "To Little Too Late, Week 28, September, 2003

the most commonly cited reasons for banks to fight shy of giving agricultural credit. While going out of their way to woo corporate borrowers and giving housing and car loans on increasingly easier terms, banks avoid giving loans to farmers, despite mandatory guidelines. According to senior officials of the Reserve Bank of India (RBI) and NABARD at Thiruvananthapuram, the nationalized banks' offtake to the agricultural sector hovers around 14 per cent, short of the stipulated 18 per cent of total lending.

While collateral security is not essential for small loans, farmers do find it difficult to get credit in the absence of credible collateral security. According to a report, agricultural loans offered by banks under various schemes were not popular among the farmers of Jharkhand, as many of them were unaware of the loan facilities. Farmers in Santhal Parganas were also psychologically credit-averse. The farmers in the state, most of whom are tribals, also complain that due to the Tenancy Act in the state they are unable to furnish the land ownership requirements as security. To overcome this problem, the State Level Banker's Committee (SLBC) had suggested that a 'Land Possessing Certificate' issued by the circle officer concerned should be treated as security. In 2002-2003, against a target of Rs. 311.07 crores, banks managed to disburse only about Rs. 218 crores.

In Haryana, high stamp duty for execution of farm loan documents was a major factor affecting agriculture credit offtake. The rate of interest charged on advances to the farmers varied from time to time, though all nationalized banks were following the government's directive of nine per cent interest on advances up to Rs. 50,000. The private banks on the other hand have their own rate of interest, at times even higher than the system. The interest charged by the cooperative banks was on the higher side at 12.5 per cent.

In Rajasthan, crop loans were being disbursed at the rate of 12 to 13 per cent as no formal direction had been issued by the Central Government on lowering the interest rates. In Madhya Pradesh, cooperative banks were not in a position to extend crop loans, as they were not receiving finances from NABARD. Commercial banks generally preferred to offer loans for tractors and not crops. Besides, the Centre's direction for slashing the interest rate to nine per cent was not being implemented and rates ranged between 11 and 13 per cent. (National Herald 2002)

Investment in the agriculture collapsed in the 1990s. Unfortunately, the last seven years of the '90s saw our rate of growth of rural employment since 1947 as 0.67 per cent. Rural credit failed in the 1990s, pushing farmers towards moneylenders. The mounting financial crisis alienated their land or other meagre resources. All this disrupted the fragile equilibrium the poor struggle to maintain. (Sainath)

Availing institutional finance easily is no less than a dream come true to the Indian farmers. History of Indian literature and cinema is full of stories of exploitation of the poor farmers by the moneylenders, the village sahukars. Even

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National Herald 2002, "Agriculture credit is Still a Far Cry for Farmers" National Herald, 22 September 2002, New Delhi.

Sainath, P., "It is the Policy, Stupid not Implementation, Part-II, Website http://www.indiatogether.org.

long after the institutional finance came into existence, the farmer had no other option, but to walk into the clutches of private moneylenders as the banks considered it too risky to lend money to the farmer. It was only to tackle this problem that Mrs. Indira Gandhi took the historic decision of nationalization of banks.

The emphasis of rural credit has been on providing timely and adequate credit support to the farmers with particular focus on small and marginal farmers and weaker sections of the society to enable them to adopt modern technology and improved agricultural practices for agricultural production and productivity. Agricultural credit is disbursed through multi-agency network consisting of commercial banks, regional rural banks and cooperatives. Of these, cooperatives have emerged as the prime institutional agency for the dispensation of rural credit, accounting for a share of 41 per cent in rural credit flow for agriculture. (Rawat 2003a)

It is evident that the commercial banks have shown a clear bias towards the urban and metropolitan area. Against the mandatory 18 per cent, the total lending to the primary sector remained at 10.1 per cent in rural areas and 11.7 per cent in semi urban areas as against 78.2 per cent in urban and metropolitan areas. This is despite the fact that 78 per cent of the saving mobilized by the commercial banks is from rural and semi-urban areas.

While the savings today get a meagre 5.75 per cent rate of interest, the loans disbursed to the farmers are at an interest rate of 14 per cent. What is highly provocative is the fact that the consumer loans for purchase of luxuries are available at around 10 per cent of interest. While getting a consumer loan for the elite requires a phone call, there is nothing in the world that the farmers does not have to do from all kinds of documentation to mortgaging all his property, besides greasing the palms of bank officials for an agricultural loan. Despite this, the delay in getting the loan makes the farmers go into the clutches of the moneylenders where they avail credit at phenomenally high rates. (Rawat 2003b)

Further, in the context of overall decline in the interest rate regime in the country, the agriculture is still suffering from high incidence of interest burden. Till nineties, the ultimate lending rates fixed by the Reserve Bank of India (RBI) for agriculture and rural development sector were at 10.5 per cent and other agriculture related activities at 12.5 per cent per annum, while the lending rate for the commercial borrower was at 16per cent. While the lending rates for the other sectors have declined considerably in the last decade, the lending rate for agriculture sector continues to be around 14 per cent.

Is it not paradoxical that in the agriculture sector, which is considered as priority sector, the rates of interest are higher than the other sector? It is worth nothing here that in the developing and developed countries, the rates of interest to credits in agriculture sector are lower than those in other sectors. For example, the Rabo Bank of Netherlands provides loans to the farmers at 5 per cent.

Rawat, Vishal 2003 a, "Time for Policy Readjustment," Agriculture Today, January 2003.

Rawat, Vishal 2003 b, "Make Hay While the Sun Shines," Agriculture Today, August 2003.

One of the most common arguments made against lending credit to the farmers has been the high default on loan repayment by farmers. But on the other hand, these very farmers are found to be repaying loans borrowed from the private moneylenders.

RFSTE made an attempt to find the reason for this in Karnataka. The study revealed that in majority of the cases the farmers become defaulters because they experience a lot of hardship in getting the loan. They are not certain whether they may avail the loan the next time even if they repay the loan in time. Therefore, the balance lies on the policy of banks and not the farmers.

Top ten corporate defaulters in the country account for more than Rs. 20,000 crores. The total corporate defaults amount around to Rs. 210,000 crorers. On the other hand, the total non-performing assets in the agriculture are less than Rs. 20,000 crores. In such a scenario, how prudent is it to blame the farmers. The recent success with the credit cards and Self Help Groups (SHGs) has shown that if the farmers are assured of availability of credit in the next season the default rate would be down by over ten-fold. Another trend, witnessed particularly over the last decade that has been causing a lot of concern is the steady decline in the rural investment.

The growth of commercial banks lending to the agricultural and allied activities saw a substantial decline in the 1990s as compared to the 1980s. Share of agriculture in the scheduled commercial banks' total outstanding credit as on 31 March 2002 was only Rs. 64,008 crores (9.85 per cent). The decline in agricultural accounts, and advances and loans through rural banking during post-reform period is given in the table 2.9.

TABLE 2.9
Trends in Rural Lending: Post-Reforms

Loans and Advances	***1994***	***2002***
Number of Priority Sector accounts of scheduled commercial banks	34.6 million	26.16 million
Rural advances of scheduled commercial banks	13.90%	13.37%
Agricultural advances of scheduled commercial banks	15.3%	9.75%
Number of agricultural accounts in scheduled commercial banks	25 million	20.35 million
Number of loan accounts (< Rs. 25,000) in scheduled commercial banks	55.8 million	37.32 million
Small loans (< Rs. 25,000) to total loan amounts	18.30%	5.90%

(Mohan, 2003)

The current banking profile as on 31 March 2003 reflects the low Credit Deposits (CD) ratio of 42 per cent and 35 per cent at the rural and semi-urban centres respectively, compared to 69.5 per cent in urban centres and 59.3 per cent at the national level. The CD ratio at the metro and the top 100 urban

Mohan, V. Jagan 2003, "Challenges in Rural Credit: RBI Advisory Committee must sow the right seeds," Business Line, 10 December 2003.

centres are as high as 83 per cent and 74 per cent respectively. The exclusive CD ratios of banks' rural and semi-urban branches were 37.2 per cent and 39.7 per cent respectively in the end of June 1969 at the time of nationalization of banks, and rose to 57.7 per cent and 49.1 per cent at end of June 1981.

After reforms, the exclusive CD ratios in the rural and semi-urban branches almost plummeted into the levels prevalent during the period of nationalization of banks. Despite the widespread banking network now, these trends indicate the continued transfer of rural and semi-urban savings to urban and metro centres, thereby causing a banking divide *a la* digital rural-urban divide. Apart from this, the 2001 census figures give an alarming picture about the usage of banking services among the rural households. Only 30.1 per cent of rural households use the banking services in the country, which reflects the latent potential demand for credit in rural segment.

The socio-economic conditions of a majority of the rural population continue to be the cause of concern for policy makers in the era of reforms and WTO. If some agreement is reached at the WTO negotiations sooner than later, the agriculture sector is poised for radical transformation. Enhanced productivity and sustainability of the sector has become imperative to withstand the global competitions.

There are still more than 200 million people in rural India who live below poverty line and for whom banking access is still not a reality despite a large bank network; the crucial gap in rural credit still exists. Therefore, the requirement for a strong and flexible structure of rural and semi-urban segment of banking needs to be emphasized. The financial sector reforms without social and rural sensitivity would only aggravate the complexities of agrarian sector reforms.

The National Agricultural Policy has targeted annual growth rate of 4 per cent over the 10^{th} plan period. Credit is the key factor in agriculture development in the context of WTO agreement and global competition, it is necessary that the credit support to agriculture be appreciated considerably because of close relationship between the credit and agriculture productivity. The task force on agriculture credit for lthe 10^{th} Five Year Plan has estimated a credit flow requirement of Rs. 736,570 crores during the next five years for achieving the envisaged growth rate. Although the flow of institutional credit for agriculture and allied activities has increased from Rs. 31,956 corores in 1997-98 to 66,701 in 2001-02. It is insufficient to meet the requirement of the Indian farmers.

Effective Credit Mechanism

One test of an effective credit mechanism is the capital formation in agriculture. A healthy capital formation would indicate that agriculture credit is productive. However, in the last decade there has been a negative growth in capital formation, of 0.22 per cent. The share of the capital formation in agriculture in the total gross capital formation declined to 10.5 per cent in 2001 from 18.6 per cent in 1980-81.

The other test of an effective credit system is rural indebtedness. According to National Sample Survey Organization (NSSO), in 1991-92, of the total debts

of Rs. 37,343 crores, 59 per cent were of rural households with 80 per cent of it going to cultivators. Rural debt went up from Rs. 1,956 crores in 1961 to 6,193 crores in 1981 and to Rs. 22,211 crores in 1991. (Pradeep, 2003)

The Alternative Micro Credit

The twin problems of non-viability and poor recovery performance of the existing rural credit coupled with the failure of financial institutions to deal with poor borrowers in an imaginative and sustainable way brought up the idea of micro credit into the rural credit scenario. This alternative combines the strength of the formal banking system with the reach and flexibility of the informal SHGs to make credit accessible to the rural poor.

In December 2003, the Reserve Bank of India (RBI) constituted an advisory committee to suggest short and medium term measures to enhance credit flow to the agriculture sector and appointed Dr. V. S. Vyas, noted economist as its chairman. The RBI decided to strengthen the rural credit delivery system to ensure a smooth credit flow to the rural sector, especially agriculture. The committee would identify the impediments in the flow of credit to the disadvantaged sections such as small and marginal farmers and landless labourers. The committee would also suggest measures to reduce the rate of interest on agriculture credit given by commercial, cooperative and regional rural banks and examine the role of NABARD as the apex institution for providing and regulating credit for agriculture development. (Hindu, 2003)

Indebtedness: The Main Factor

There is relationship between credit availability and agriculture productivity. Credit is undoubtedly the most important factor in the agriculture development. In the wake of WTO challengs, it is necessary that the credit support to agriculture be enhanced considerably if we are to compete in the global market. However, it is shocking to learn that rather than increasing the credit support to agriculture and increasing public investment, the government is doing exactly the opposite. The farmers' suicides across the states are blamed on their indebtedness. The situation therefore demands that the government should reorient its policy as regards to rural credit.

Studies have shown that even in the most progressive and agriculturally developed states like Punjab, 78 per cent of farmers have availed credit from non-institutionalized sources such as relatives, *arhtiyas* (grain brokers), agro inputs dealers and private moneylenders. The rate of interest paid by the farmers to avail the credit would make the topmost corporate houses sweat in the winter, as the farmers pay minimum of two per cent per month compounded rate of interest.

The burden of indebtedness in rural India is great, and it falls mainly on the households of rural working people. The exploitation of this group in the credit market is one of the most pervasive and persistent features of rural life

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Pradeep, U. 2003, "Agriculture Credit Scenario in India," Agriculture Today, July 2003.
Hindu 2003, "RBI Setup Panel on Rural Credit Delivery," Hindu, 17 December 2003

in India, and despite major structural changes in credit institutions and forums of rural credit in the post-independence period, situation is much fragile in most places. The credit market is highly fragmented and regressive. Moneylenders attend the most urgent-felt needs like consumption, medical aid, emergency situations, and daughter's marriage.

In sugar belt areas of Maharashtra, drowning in debt, many small farmers have had to sell part of their land. The moneylenders are raking these in. They charge farmers interest at rates anywhere between 36 and 60 per cent, sometime even more. If the farmers can't pay, they just take over the land. Earlier, when government and cooperative banks came here, moneylenders lost their hold over small peasants. Now they are back with a vengeance. (Bunsha, 2003)

Sugarcane growers are being squeezed from both ends. Sugarcane prices offered by factories have fallen by around 25 per cent in the past five years. Around a third of factories have not even paid farmers the Minimum Support Price. Production costs have risen by around two-thirds in the last five yeas. There have been huge hikes in power, irrigation and other overcharges due to economic liberalization.

Scenario is same in Western UP, the other sugarcane growing area in the country, where labourers from Bihar also migrate during harvesting season. Big farmers hire them in groups. As factories do not pay in time, these migrants in turn do not get their full wages. The exploitation of the migrant workers and landless labourers is double edged, both by the factories and by the big farmers. Trapped in a cycle of debt, most of the small farmers use up their income to pay the loan. In fact, some of the small farmers manage their daily rations for some period by selling the sugarcane leaves as fodder.

Farmers have also recorded a decline in their income due to increasing input costs and low produce. According to a study by the Centre for Research for Rural and Industrial Development (CRRID), Chandigarh, 93 per cent farmers recorded substantial decline in their annual income, while only 3 per cent recorded farming as profitable and 4 per cent has static earning. (Indian Express, 2003)

An obvious and accepted problem faced by Indian farmers is that they often do not get a fair price for their produce. A disproportionately large fraction of the price that the consumers pay does not go to the farmers, but is appropriated by middlemen and traders. This problem arises mainly because farmers cannot directly reach consumers, and they have to depend on middlemen or traders to market their products.

By definition, traders are agents who buy in one market and sell in another. The markets where they buy and those where they sell are separated either spatially or temporally, or both. An incident of spatial trade takes place when the trader buys form a producer at the local village market and sells to a

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Bunsha, Dionne 2003, "Sugar Daddies," The New Internationalist, No. 363, December 2003.

Indian Express 2003, "High Inputs Affecting Farmer's Profit Margin," Indian Express, 20 October 2003.

wholesaler in a distant city market. Inter-temporal trade takes place when the trader buys at one time, say in the post-harvest period, and sells at another point of time, say in the pre-harvest period. In the first case, the farmer cannot reach the distant city market because of the lack of an appropriate network. In the second case, he cannot hold his stocks from the busy post harvest season to the lean pre-harvest season due to immediate cash requirements and lack of credit. (Mitra and Sakar 2003)

So, in both the instances he has to depend on the trader, who in turn makes full use of this dependence to reap supernormal profits. Of course, such supernormal profits would not be possible if there were sufficient competition among traders. Unfortunately, in many Indian agricultural markets such competition is absent and markets are controlled by a small number of traders who manage to earn oligopolistic profits.

In fact, a survey data indicate that while producers actually make for the crop like potato, when costs of their inputs like labour are taken into consideration, the traders, in particular the larger ones, earn huge profits.[30]

Study has shown that following are some of the reasons for the increasing suicides among farmers:

(i) Failure of institutional credits for small and marginal farmers.

(ii) Withdrawal of government intervention from safety nets such as fair price shops (FPS), and the exclusion of poor and indebted from the food distribution system.

(iii) Increasing cost of agriculture inputs like seeds, fertilizers, pesticides, etc.

(iv) Reduced price of agriculture produces.

(v) Increasing dependence of small farmers on moneylenders, at rates of interest from 24 to 60 per cent per annum, sometimes even more.

(vi) Cumulative crop loss.

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Mitra, Sandip, and Abhirup Sarkar, "Relative Profitability From Production and Trade: A Study of Selected Potato markets in West Bengal," Economic and Political Weekly (Mumbai), 1-7 November 2003, vol. 36, no. 44.

CHAPTER III

Genetically Engineered Seeds

The Case of Transgenic Cotton Trials in India

Introduction

The Indian seed industry is rapidly moving into a phase of "corporate control over the seeds" with the introduction of genetically engineered / transgenic crops. In this corporate control the technology and investments are made by the transnational / multinational corporations and the Indian counterparts provide the Indian germplasm and a marketing base.

Farmers' acceptance and dependence on hybrid seeds in the Green Revolution era makes the corporate strategists to foresee wide acceptance of genetically engineered seeds by Indian farmers.

Building of corporate empire in seed sector is thus relatively a new phenomenon, which started off since 1998, when Monsanto entered into an exclusive agreement with Mahyco (Maharastra Hybrid Seeds Company) and formed a joint venture, to introduce genetically modified (GM) Bt cotton in India. In 1998, Monsanto-Mahyco Biotech (India) Pvt. Ltd. (MMBT). MMBT started the first ever open field trials of genetically modified crop in India. They introduced Bt cotton in 40 locations across the country.

Ten companies now own 30 per cent of the $23 billion annual commercial seed trade, according to recent estimates, and four of those — Monsanto, Syngenta, Aventis and DuPont — control virtually all GM crops. If the mergers and acquisitions continue as it is going on, by the early part of next century less than a handful of companies will possess control over the entire agricultural foundation for every society. A glimpse of up-to-date mergers and acquisitions that have taken all around the world is presented in Table 3.1.

Genetically modified crops have been introduced to Indian seed industry without understanding and assimilating the inherent adverse impacts of such crops at a time when the science of genetic

> Twenty years ago there were thousands of seed companies, most of which were small and family owned. Today the top ten global seed companies control one third of the 23 billion dollar of the commercial seed trade. Twenty years ago there were about 65 agrochemical companies involved in the manufacture of crop chemicals. Today the top ten pesticides manufacturers account for over 90% of the global market. Twenty years ago the top twenty pharmaceuticals corporations controlled about 5% of the world pharmaceutical market. Today the top ten account for over the 44% of total sales. And today the top ten firms hold the 61% of the animal veterinary market. If you look at the dominant companies, all of these different sectors in plant breeding, pesticide, veterinary medicine and pharmaceuticals, you find the same companies dominate in all sectors. And these are the gene giants and they include the world largest agrochemical and pharmaceutical corporations. In the field of genetic engineering of agriculture, there essentially five corporation which dominate globally. These are Syngenta, Aventis, Monsanto, Dupont and Dow.
>
> **- Hope Shand,** RAFI, USA

TABLE: 3.1

Mergers and Acquisitions of major Biotechnological companies involved in agriculture

Year	*Company*	*Specialisation*
2000	Novartis and Astra Zeneca merged to form SynGenta	Agrichem
2000	Monsanto's pharma business merged with Pharmacia & Upjohn	Health care
2000	BASF AG acquires American Cyanamid	Crop Protection
2000	Monsanto Chemicals acquires Monsanto Technologies & Monsanto enterprises	Crop Protection
2000	AgrEvo India & Rhone Poulenc Agrochemicals merged to form Aventis Cropscience	Crop Protection
1999	Aventis CropScience acquired ProAgro Group	Seed Operation
1999	Panoli Agrochem of Novartis with Hikal Chemicals	Crop Protection
1999	Cyanamid Agro with American Cyanamid	CropProtection
1999	Pioneer Hi-Bred & Mycogene acquired by DuPont	Seed Operations
1999	Holden acquired by Monsanto	Seed Operations
1998	Cargill acquired by Monsanto	Seed Operations
1998	Dekalb acquired by Monsanto	Seed Operations
1998	Mahyco acquired by Monsanto	Seed Operations
1998	Unilever acquired by Monsanto	Seed Operation
1998	EID Parry acquired by Monsanto	Seed Operation
1997	Holden acquired by Monsanto	Seed Operation
1997	Semetes acquired by Monsanto	Seed Operation
1997	Millenium acquired by Monsanto	Seed Operation
1996	Agracetus acquired by Monsanto	Seed Operation
1996	Calgene acquired by Monsanto	Seed Operation
1995	Kelco acquired by Monsanto	Crop Protection
1996	Roche acquired by Monsanto	Women's health care

Source: *Compiled from Monsanto (RFSTE), 1998; the Hindu, 21st December 1998; & the Hundu Business Line, 2nd April 2000.*

modification of plants is in its infancy and lot of genuine research needs to be undertaken before it is deemed fit for commercialisation.

The sixties revolution of cultivating monocrops of hybrids / HYVs has caused tremendous loss to our genetic diversity. This revolution has not only increased the dependence on chemicals in agriculture but also increased the risks to farmers in the form of vulnerability to diseases and pests' attacks.

Today the stage has been reached where the looming prices coupled with unreliable quality of agri-chemicals is threatening the very process of agriculture. The cost of cultivation of different crops has gone far beyond the average farmers' affordability. To add to this, genetic engineering in crops is being put forward as the solution to farmers.

Genetic engineering (GE) revolution in the seeds and crops is not the solution to farmers, instead it is a revolution to deteriorate the farmers and robe them economically, socially and ecologically.

The present chapter puts in place the economic, socio-ecological, and legal aspects of the genetic revolution in seeds and crops in India. Also shows how the corporate empire is trying to commercialise the technology before it is obsolete and meet the same fate as the green revolution technology. The genetic technological revolution is not for the farmers to benefit but for the corporate to reap the profits.

1. Economics of GE Revolution

Genetic engineering in agriculture has been seen, as economically viable option for hybrid agriculture of green revolution. Theories have been put

forward to advocate the merits of this technology and the benefits which the farmer will reap through adoption of this technology in their practices.

Developing genetically engineered crops is not an easy task for everyone. The first and foremost important reason for this is the heavy investment, which the technology demands in research and development. So far private companies in the world are able to develop genetically engineered crops.

Secondly, this technology is out of the public domain. If at all developed by public sector it has to be funded by major agri-corporate. Already in the North the agri-corporate are controlling major research centers in renowned Universities.

Once the products are monopolised by agri-corporate, there will be no price bargain and the farmers have to be at the mercy of these corporate.

Industry representatives, in calling for Plant Variety Protection (PVP) legislation in India, identify several "commercially significant" concerns in monopolisation of agri products :

- the prevalence of the use of lines stolen from one company by another which may not have its own research and development programme. These parental lines are then used for the production of hybrid seed. By and large, such thefts are attributed to ephemeral 'fly by night' companies. Some credence is lent to this viewpoint by small companies themselves. For example, the managing director of one well-established though small seed company alluded to a fear of "retrospective royalty claims". However, the most notorious example followed the large-scale exodus of staff from Pioneer. Many employees left for other large companies, reputedly taking parental lines with them. It is claimed by the former managing director of Cargill that 'all' long-maturity maize currently planted in India is derived from this dissemination of Pioneer's parental lines. The manager of Nath Seeds commented that India is recognised by the International Seed Trader's Association staff as "the global capital for securing [other companies'] parental lines".

- the interception of seed between contract grower and seed company, by small seed retailers. Such retailers may offer contract growers a higher price for hybrid seed than agreed contractually with the owner of the foundation seed from which this was produced. Presently, the only sanction which large companies can take in this instance is to drop offending farmers as contract growers in subsequent seasons.

- the sale by smaller companies of second generation open pollinated seed, and F2 hybrid seed. This is widespread. One seed retailer in Jalna, for example, sold second generation open pollinated chili seed at around half the price of the proprietary seed.

Some companies attach relatively little commercial significance to the lack of PVP. Absence of protection for open pollinated varieties is of little concern to many larger companies (which deal mainly, or exclusively, in hybrid seed) and reuse of hybrid (F2) seed is not perceived as an important issue. The managing director of Cargill, for example, suggests that PVP is an irrelevance with respect to two-and three-cross hybrids. He does concede, however, that

introduction of single-cross hybrids will be postponed pending legal protection of these. Furthermore, one of his predecessors at Cargill claims that the company would introduce open pollinated varieties of rape seed if legislation guaranteed protection of this. The director of Pioneer also indicated that his company would have introduced single-cross hybrid maize seed, were this protected by PVP legislation. Indeed, he claims that none of the eighteen companies selling hybrid maize seed in India are selling higher yielding single-cross hybrids.

However, other representatives of large companies call for immediate legislation to address these infringements (as they see things) of their intellectual property rights. The business manager of Hindustan Lever, for example, sees the lack of PVP legislation as a major restriction upon commercial hybrid production, and predicts a rapid invigoration of the private sector market following such legislation. He emphasizes the current risks of development and production of hybrids due to theft of parent, breeder or foundation seed.

It seems probable that the widespread replacement of local land-races with high yielding varieties was at least in part dependent upon farmer's freedom to save and reuse seed from season to season, without the obligation to repurchase from seed suppliers. This practice is particularly prevalent in the case of open pollinated seed (though F2 hybrid seed may also be saved). Seed producers, however, profess to be uninterested in legislating against either the seasonal retention of seed, or the exchange of this non-commercial basis between farmers. Deepak Mullick, the managing director of ITC Zeneca, speaks for the Associated Seed Industry (ASI) (a body representing the interests of the private sector seed industry in India): "What is a farmer's right? The farmer has a right to access to the best available seed. Saving seed for his own use, and exchange with his neighbours is not important to ASI; sale by small seed companies is".

It is clear that this attitude may be more pragmatic than magnanimous. Some estimates put the proportion of saved seed planted at over 90%. Farmer saved seed can therefore hardly be considered a commercial irrelevance. Rather, many managers agree that it would be impractical to litigate against farmer's use of saved seed, even were this to be made legally possible, given the prevalence of seed reuse. This amounts to tacit acceptance of the fact that legislation based upon UPOV 91 is inappropriate in an Indian context. In the West, most farmers are consumers, on an annual basis, of proprietor seed. In these countries, the legislation can be enforced - and indeed already has been enforced in some instances.

Plant Breeder's Use of Local Landraces

Under UPOV 91 stipulations, the role of farmers as innovators in the development and constant refinement of local landraces is unrecognised. There is a fundamental asymmetry in the UPOV 91 recommendations. Industrial breeders are permitted to incorporate traits from landraces in their lines. These traits then become subject to plant variety protection, which is extended retrospectively to landraces exhibiting these same characteristics. This provision does not take effect reciprocally, however, the use of proprietary varieties in

farmer's own breeding programs is of course prohibited. This generates a ratchet effect, by which landraces become subject to variety protection as their traits are incorporated in proprietary varieties and hybrids. The pool of landraces free from such restrictions will thus progressively diminish as plant breeders accumulate control over farmer's own varieties.

To what extent this scenario will be realised depends in large part upon the dependency of plant breeders upon local landraces as sources of 'new' and desirable traits. Plant breeders are able to access land-race germplasm either through public germplasm banks, or directly, by prospecting down on the farm.

Public Sector Germplasm Banks

Plant breeders in India have access to public germplasm banks, subject only to a small administration charge. The National Bureau for Plant Genetic Resources (NBPGR) holds a total of 165,000 accessions, of which 104,000 are landraces. It also holds many varieties and hybrids generated by public sector research institutions. Problems are encountered in encouraging private companies to deposit their germplasm with the bank-a scheme has been suggested whereby companies can use locked boxes, to which they alone will be granted access for some fixed time period.

Prospecting For Landraces

By and large, multinational companies are not presently dependent upon local germplasm in the development of their seed. As discussed above, the multinational market niche is centered upon selection of extant seed, globally, and production and marketing of this for the Indian farmer. In the case of typical seed sold by MNCs (sunflower, maize, soya, sorghum sudan grass or cotton, for example) there are no important resources of Indian germplasm upon which to draw.

However, producers of seed for crops which have a long history of arable exploitation in India are more highly dependent upon germplasm from local landraces for their research and development. In the case of national Indian companies, which may not have the access to international sources of germplasm available to multinational companies, use of local landraces is more prevalent. Century Seeds, for example (an Indian company specialising in development and production of hybrid vegetable seed) admits to heavy reliance upon local landraces. These are acquired on an informal basis. Whether or not farmer's heightened awareness of intellectual property rights issues has affected the availability of local landraces to commercial plant breeders is equivocal. Some company representatives, A. Mangat, Director of Century Seeds for example, report that demands for payment are increasingly made by local farmers for access to their germplasm. The director of Century Seeds failed to see the basis for farmer's demands for payment, feeling that they should have no rights to their landraces. Otherwise, he observed, "royalties should be paid to the Iraqis for wheat, and to the Mediterraneans for cauliflowers". The basis for discrimination between farmer-developed landraces (a "national resource") and Century Seed's latest tomato hybrid, based upon such a landrace (and guarded possessively by Century), is unclear.

Others point to the case with which local landraces can be collected, and

the difficulty of policing their exploitation. Seed can simply be recovered, for example, from produce bought at local markets. This points to the difficulty of safeguarding farmer's rights to their germplasm, even in the event of such rights becoming recognised by law. Some large seed companies (SPIC, for example) are investing in biotechnological approaches to identifying their germplasm (screening at the level of DNA sequence), allowing this to be traced in the event of suspected use by other companies. Such technology is of course not available to local farmers who may experience corresponding difficulty in demonstrating the unacknowledged use of their landraces in proprietary hybrids.

This dependency upon local landraces does not translate into a concern for their preservation in the field. Rather, crop researchers allude to the convenience of public sector germplasm banks, and foresee no reason why free access to comprehensive banks shouldn't replace prospecting for germplasm in the field.

Land Ceilings

On the whole, private sector seed companies produce parent seed and breeder seed on their own farms. This is principally for reasons of security. Farmers are then supplied with foundation seed and produce hybrid seed under contract. Few company representatives identified landceilings as presenting a problem in seed production. This was partly because circumventing restrictions upon land ownership (or at least leasing) was considered straightforward. Also however, all company representatives said that, even in the event of landceilings being abolished, they still envisaged contracting seed production to farmers. Large areas of land are required for the production of hybrid seed, and it was considered uneconomic to attempt this on corporate owned holdings. That land-ceilings are not considered an issue by many companies is demonstrated by the ignorance of company representatives of actual land-ceilings. In Andhra Pradesh, for example, manager's estimates of the maximum possible land holding ranged from 45 acres to 550 acres.

But there is a further incentive for companies to continue contracting seed production to small farmers. B.D. Sharma, Former Commissioner, Commission on Schedule Cast & Schedule Tribes, Govt. of India, points out that "the embodiment of labor in agricultural produce has been devalued by treating family farm labor as of zero value, because it is free" (Shiva, 1996). This attitude is confirmed by the general manager of ProAgro PGS, "his whole family at minimal expense, whereas on corporate farms, management staff would need to be employed at additional expense". Great care is exercised over cultivation of small areas of crop by a farmer and his family, not least because their very livelihood depends directly upon the productivity of their land.

Some managing directors take the opposite view, however, Deepak Mullick, the managing director of ITC Zeneca, sees it as highly problematic that "seed production over an area of a thousand acres entails dealing with a thousand farmers". Apart from the administrative problems this generates, there are problems of isolation of the seed production crop. Company land ownership, he feels, is a priority, particularly for production of breeder seed. The issue of

land-ceilings is also important for the president of Indo-American Hybrid Seeds. Mr. Attavar, who in addition to his own farms, produces seed through contract with between seven and eight thousand farmers. He has appealed for an exception to the Karnataka State landceiling. He expects to secure this, he claims, setting an important precedent.

2. New Technologies

In addition to the encouragement of foreign capital inflows, liberalisation overtly courts the transfer of new technologies from industrialised countries. It is anticipated that imports of new technology will precede the diffusion and assimilation of these by domestic industries, boosting international competitiveness in the global marketplace. However, such transfer cannot be expected to occur on the basis of deregulation of technology import alone. State intervention to nurture domestic research and development projects may also be needed. According to Bhaduri and Nayyur 'the assumption, strongly advocated by the government, that direct foreign investment will transfer technology automatically, is both simplistic and dangerous". They claim "..it is clear that market structures and government policies have not combined to provide an environment that would encourage the absorption of imported technology...., or create a milieu that would be conducive to diffusion and innovation". The failure of liberalisation to encourage technology transfer of Monsanto, for example, does not consider technology transfer to be an important factor in the liberalisation of the Indian economy, and does not foresee transfer of Monsanto technology to domestic companies. He says that it was made clear before Monsanto developed its agricultural biotechnology business in India that this would be controlled solely by the multinational and that there would be no agreements for licensing the technology to others. Indeed, Monsanto's collaboration with Mahyco leaves little room for optimism that it will lead to increased competition and technology transfer. Monsanto has signed an exclusive deal with Mahyco, which would require the approval of the latter if Monsanto's technology were to be made available to other Indian seed companies. Although one such company is apparently prepared to pay Rs.400 million for the incorporation of the Bt construct into their own cotton hybrids, under contract, it is to be anticipated that Mahyco will veto any such arrangement.

But if exclusive agreement (such as that forged between Monsanto and Mahyco) seem to leave few opportunities for broader dissemination of technology, such opportunities are still less easy to foresee in some other cases. Nath seeds, for example, has entered in an agreement with Royal Sluis, a Dutch company owned by SVS Seminis. Biotechnological development of vegetable hybrids is expected to proceed through a joint venture recently forged between SVS Seminis and Monsanto. Nath anticipates benefiting from this without needing to enter direct contracts with Monsanto itself, and quite possibly without any initial research and development being conducted in India. According to one possible scenario, parental lines would be sent by Nath to Monsanto laboratories in the US for incorporation of the Bt construct, and returned for subsequent field testing in India.

The benefit of joint ventures with foreign companies which is most frequently extolled by representatives of such enterprises, is the availability of foreign germplasm. Indeed, one is left with the impression that had the exchange of germplasm from the West to India been as fluid historically as it has been in the reciprocal direction, there would be little benefit accruing from foreign investment in the seed industry.

Other company representatives do not even identify access to international germplasm as a benefit of foreign collaboration. The business manager of Hindustan Lever, which is controlled by a 51% stake held by Unilever, was unable to identify any area of technology transfer from the parent company to Hindustan-Lever. This latter company has produced some 80-90% of its product range in-house, independently from Unilever. The managing director of Kanchan Ganga Seeds is also seeking tie-ups with foreign companies, though emphatically not for technology transfer (the company claims to be a leader in hybrid maize technology, with its short-maturing hybrid). Rather, Kanchan Ganga has experienced difficulty in securing loans (although its current loan ceiling is 10 million rupees), driving it to the sale of some parental lines, and seeks foreign collaboration as collateral for further investment.

In another area, multinational companies claim effective technology transfer to the farmers themselves. This, it is claimed, has been particularly significant in encouraging better cropping and planting practices. In 1988, for example, public sector experts were recommending planting of sunflower seeds at a density of 3 kilograms per acre. Cargill found better yields were obtained by planting at the far lower density of one kilogram per acre. Yet Cargill can lay claim to no unique area of expertise qualifying them to make such recommendations. It would clearly have been equally possible for property funded public sector research institutions, able to finance research in commercial hybrid crops, to have reached the same conclusion.

Biotechnology

Biotechnology development of new transgenic crop varieties in India relies heavily upon western technology and investment. Development proceeds either through branches of transnational companies, or a marriage of convenience between western biotechnology firms and national seed companies. Under this latter scenario, the western collaborator provides biotechnological expertise and investment, whilst the national company provides Indian germplasm and a marketing base. Already, representatives of smaller seed companies are concerned that, limited as they are to classical breeding technologies, they will be progressively excluded from the market. Increasingly, this market will be dominated by a small number of large companies with the financial resources to invest in biotechnological research.

Projections for the growth of the transgenic seed market vary. Some company representatives point to the difficulty experienced by the industry in persuading farmers to switch to hybrid seed, despite the first introduction of this more than years ago, and are correspondingly pessimistic about the acceptance of transgenic crops. The marketing manager of Cargill predicts that Bt-maize seed will sell for perhaps five times the price of hybrid seed, and foresees that it will be a decade or more before transgenic crops are generally

accepted. Others however express the opinion that the source of the farmer's inertia to moving toward use of hybrid seed stems from a reluctance to pay for seed purse. Having developed a high level of acceptance of hybrid seed, corporate strategists foresee that acceptance of genetically engineered crops will be far easier to effect. Indeed, Mahyco, who have formed a company jointly with Monsanto, hope that generically modified cotton will account for entire sales of hybrid cotton seed within 7-10 years. Sales of RoundUp Ready soybean and Bt modified maize are expected to follow within the next two years (see Table 3.2).

TABLE 3.2
Some releases (in India) of transgenic crops expected within the next few years

Company	***Transgenic Crop***	***Timescale for Introduction***
Monsanto/ Mahyco	Bt-cotton	Imminent
	RoundUp Ready soybean	Next two years
	Bt-maize	-ditto-
SPIC	Male-sterility in paddy	Next few years
ProAgro-PGS	Brinjal-insect resistance	-ditto-
	Cauliflower-insect resistance	-ditto-
	Cabbage-insect resistance	-ditto-
	Tomato-insect resistance	-ditto-
	Cauliflower-nuclear male sterility	-ditto-
	Mustard-nuclear male sterility	-ditto-
Nath Seeds	Nath has entered joint agreement with Seminis and Peto, who in turn have entered agreements with Monsanto for the introduction of Bt technology to vegetables	Unknown
Bejo Zaden	Bt-cotton	Next few years
Cargill	Bt-cotton	-ditto-
Sandoz	"Genetically modified crop"	Unknown
Indo-American	Leaf-curl resistance in tomato	-ditto-

Source: *Agrawal, 1996, and personal communications.*

In their corporate literature, ProAgro are buoyant about the possibilities of developing longterm biotechnological solutions to the problems of insect pests, writing that they are developing "...a proprietary strategy to prevent or delay the development of resistance in insects to Bt proteins". Privately, however ProAgro representatives concede that the projected commercial life expectancy of their products is just 4-5 years. After this period, it is expected either that the disease or insect resistance of the crop will have been superseded by more effective products. This rapid obsolescence is viewed as being advantageous for several reasons.

Firstly, as pointed out by the former managing director of Monsanto, it will be difficult for rival companies to acquire the technology, and develop and release competitive products, whilst there is still demand for these. This is viewed as an important consideration in the absence of Indian PVP legislation.

Secondly, it will ensure that the biotechnology industry continues to be highly technology-intensive. Technology transfer to domestic companies will be delayed as a result of the fast pace of Technology transfer to domestic companies will be delayed as a result of the fast pace of technological change. This will effectively reserve the market in transgenic crops for multinational companies with the financial muscle necessary to remain competitive in the field.

3. Illegal Trials of GE in India

In 1998, private seed company – Mahyco in collaboration with Monsanto started the first open field trial of Bt cotton with the intention of commercialising it in India. In the process all the rules and regulations of transgenic trials have been taken over by this corporate venture. Concerned government departments were also not serious on the implications. The department of Biotechnology provided the clearances and the field trials were given green signal.

For the field trials Mahyco contacted the individual farmers based on prior acquaintances. Mahyco has been supplying farmers with new hybrid seeds for initial testing. Based on the performance of these new seeds, farmers patronised Mahyco over the years and established good rapport.

The genetically engineered Bt cotton seeds were also tested in the similar way. At most of the trial sites, farmers selected were the exemplary farmers who were singled out on the basis of their past performance in getting good yield of major crops in the previous cropping season. **For instance, Sri Bassanna at Sindhanur district in Karnataka, was selected for the trial based on performance for best yield in paddy.**

In some of the trial sites, Mahyco's own seed dealers were given to test Bt on their fields and for recommendation to other farmers through these dealers. Mahyco agreed to meet the expenditures incurred on the cultivation of the Bt crop on their fields.

In order to attract other farmers, Mahyco-Monsanto organised khestra utsav to show the crop performance to other villagers from neighbouring villages. This has been the strategy of many companies on market expansion through concentrating upon development of market *per se*, rather than pushing their own particular brand. Farmers are invited to the trial fields for exhibition of uncommonly high yields of branded seed. However, during shows organised by the Monsanto-Mahyco, the cost of technology has not been revealed to the farmers, which is associated with sale of genetically engineered seeds. Thus, cost of such technology becomes important in the context where farmers had been exposed for exchange of saved seeds to purchase of hybrid seeds at much lesser price than the Bt would cost.

As long as the genetic engineering is taking place in labs or in farms that are totally contained, the Review Committee on Genetic Manipulation (RCGM) of the Department of Biotechnology (DBT) governs the approval. The moment trials are conducted on the open environment, as the case is with these trials, the Genetic Engineering Approval Committee (GEAC) governed by the Ministry of Environment and Forests (MoEF) become active under the Environment (Protection) Act (EPA) 1986. In what follows, we present how these trials are illegal, unscientific and fraudulent.

The Chronology of Illegal Field Trials of *Bt* Cotton

The sequence of events, which took place in implementing the illegal trials in India, can be briefly outlined as :

24th April 1998	Mahyco files to Department of Biotechnology for field trials
May 1998	Joint venture between Mahyco and Monsanto formed
13th July 1998	Letter of Intent issued by DBT without involving Gentic Engineering Approval Committee (GEAC).
15th July 1998	Mahyco agrees to conditions in letter of intent.
27th July 1998	Impugned permission by DBT for trials at 25 locations granted.
5th August 1998	Permission for second set of trials at 15 locations granted.
6th January 1999	PIL filed by Research Foundation for Science Technology and Ecology in the Supreme Court of India
8th February 1999	RCGM expresses satisfaction over the trial results at 40 locations.
12th April 1999	RCGM directs Mahyco to submit application for trials at 10 locations before Monitoring and Evaluation Committee.
25th May 1999	Revised proposal to RCGM submitted by Mahyco.
June–Nov 1999	Permission granted for different trial fields
Oct–Nov 1999	Field visits
May 2000	Mahyco's letter to GEAC seeking approval for "release for large scale commercial field trials and hybrid seed production of indigenously developed Bt cotton hybrids".
July 2000	GEAC clears for large scale field trials on 85 hectares and seed production on 150 hectares and notifies through press release.
October 2000	RFSTE filed an application for amendment in the petition challenging the fresh GEAC clearance.
18th October 2001	GEAC orders uprooting of "Navbharat-15", which was found to contain transgenic Bt.
26th March 2002	32nd Meeting of the GEAC was held to examine the issue of commercial release of Bt Cotton. Members of GEAC from ICHR, Health Ministry, Commerce Ministry, CSIR, ICAR did not attend the meeting. Inspite of the absence of important members of the GEAC, approval was granted to three out of four of Monsanto - Mahyco's transgenic hybrids.
5th April 2002	Formal approval granted to mach-12, Mach – 162 and Mach 184 by A.M. Gokhale, Chair of GEAC. Order of 05.04.2002 is a conditional clearance valid for three years. The stipulated conditions/restrictions are a clear implied admission on the part of the government that the tests are far from complete. In effect, the commercialisation was an experiment. Monsanto-Mahyco

had been asked to gather further data and submit annual reports on the resistance that the insects develop over a period of time to GM seeds and to conduct studies on resistance to bollworm, susceptibility tests, and tests for cross pollination.

2nd March 2005 In March, RFSTE releases results of continued failure of Bt Cotton, especially in Andhra Pradesh.

4th March 2005 GEAC rejects renewal of the 3 Bt Cotton varieties planted in the Southern States. However, other Bt varieties are cleared in Northern States.

The stamp of clearances for all the trials of genetically modified cotton came through the advisor, Review Committee of Genetic Manipulation (RCGM) through its letter dated 27th July 1998 and 5th August 1998 to Maharashtra Hybrid Seeds Company (Mahyco) to carry out multicentric trials on transgenic cotton *(Bacillus thuringiensis)* initially at 25 locations by permission dated 27th July 98 and thereafter 15 locations by permission dated 5th August 98 making 40 locations in 9 states. The date of sowing obtained from the individual farmers' by the RFSTE team show that the crop has been sown before the trial permissions were obtained in July 1998.

The field trials of Bt cotton on 40 locations in 9 states are totally unscientific and illegal. The permission granted to Mahyco-Monsanto for the open field trials is in category of organisms with potential ecological risks. Environmental risks under this category need to be assessed and regulated in accordance with the Rules called the "Rules for the Manufacture, Use, Import, Export and Storage of hazardous Microorganisms Genetically Engineered Organisms or Cells, 1989" framed under the Environment (Protection) Act, 1986 (hereafter referred as "Rules").

The permission has been granted for carrying out multicentric field trials without assessing ecological impact on biodiversity, protection of environment, danger to the agriculture and health hazards to the human beings and animals. The said permission has not only been granted in violation of the provisions of the above mentioned Rules which clearly stipulate that any such permission can be granted only by the Genetic Engineering Approval Committee under the Ministry of Environment and Forests, but even the guidelines of Department of Biotechnology which have been framed under these Rules go contrary to these Rules besides being totally inadequate to deal with the present state of genetic engineering requiring stringent measures and precautions to be taken in such trials. The permission has been further vitiated by reason of the concerned nine States not being consulted before granting such permission when "agriculture" is a state subject and such experimentation has direct impact on the agriculture of a particular state. In fact, the two committees viz. State Biotechnology Coordination Committee (SBCC) and the District Level Committee

It is very clear that the state is helping the private seed companies. Dr. Vandana Shiva and I met the state agriculture minister and presented our Bt case, which resulted in setting up of a fact-finding committee. However, not single paisa has been paid as compensation to the farmers for their crop loss. Consumer courts were approached for the failure of the cotton crop but of no avail. 17,000 acres of Cargill's maize failed. In 20,000 acres of cotton crop no cotton bolls formed, resulting in a major loss of crop and money. 15 groundnut farmers committed suicide in Anantpur in 1998 due to a Rs. 600 crore loss. The government has taken no steps.

S. Malla Reddy,
Andhra Pradesh Rytu Sangham

(DLC) were not informed in advance before the grant of permission as these Committee are concerned with biosafety of such genetically engineered trials in the State as well as in a particular district. Therefore the permission which has, therefore, been granted is violative of Article 14, 19 and 21 of the Constitution; it is also violative of the provisions of Environment (Protection) Act, 1986 and the Rules framed under section 6, 8 and 25 of the said Act.

Fresh Clearances by MoEF Despite Supreme Court Case

The GEAC which has been totally absent in the approvals of the field trials of the last two years has suddenly become active and gave fresh clearances in July 2000 to undertake trials of Bt cotton on 85 hectares and allowed seed production on 150 hectares, implying the intention to expand transgenic cotton cultivation without waiting for social, ecological and economic assessments.

The official note circulated by MoEF states that "M/s. Maharashtra Hybrid Seed Company (MAHYCO) has been permitted to undertake field trials and generate environmental safety data on transgenic cotton in various agro-climatic regions of the country". This proclaimed objective is totally misleading. Firstly because, it hides the role of Monsanto which has the Patent on the transgenic Bollgard Cotton and with whom MAHYCO has a joint venture i.e. Monsanto MAHYCO Biotech (India) Pvt. Ltd. (MMBT).

In any case corporations promoting Genetic Engineering cannot be the source for biosafety data. Biosafety data has to be generated by ecologists and other independent experts. Depending on Monsanto-MAHYCO for environmental safety data is like depending on the chemical industry for data on chemical pollution and the auto industry for CO_2 pollution. Pollution monitoring and assessment agencies must be independent of the commercial interests that gain from an activity that generate pollution. In the case of genetic pollution, which as the note says is a legitimate public concern, similar independence needs to be maintained for environmental safety data.

Given the public concern related to GE the absence of public participation in the Monitoring-cum Evaluation Committee is another major cause of concern. Since over the last two years studies of RFSTE have shown that the claims related to transgenic cotton in terms of yields or reduction in pesticide use have been fabricated to speed up commercialisation and have no scientific basis.

This is a democratic imperative and fundamental to the right to know. The government is silent on the results of the last two years of field trials and is reluctant to open monitoring and evaluation for public participation.

The MOEF falsely associates GE with increase in food productivity. All data around the world is showing that yields of transgenic crops are lower than conventional crops. GE will not promote food security though it can create new environmental risks through genetic pollution.

Farmers' Suicides: Opportunity for Gene Giants to Launch Genetically Engineered Crops

The farmers' suicides in Andhra Pradesh, Karnataka, Maharashtra, Punjab and other states of India (see chapter 3) as well as the ecological disasters like the continuous failure of cotton in last few years in Andhra Pradesh and Punjab are used by industry to sell new "miracles" and new vulnerabilities.

The excessive use of pesticides in Andhra Pradesh and Punjab was related to the vulnerability of the hybrid seeds. However, the genetically engineered seeds which have pesticides built into them are now being offered by the multinational seed industry as the only alternative to the use of pesticides.

Bt-cotton is one of the products of genetic engineering being offered by Monsanto, the leading US based Agricultural Biotechnology Company as a 'miracle' to end the use of hazardous pesticides, to save the cotton crop from American bollworm and to increase the yield.

4. Monsanto's Genetically Engineered Bt Cotton : New Miracle or New Disaster?

What is Bt-Cotton?

Bt. toxins are a family of related molecules produced in nature by a soil bacterium, *Bacillus thuringiensis* (Bt.). Farmers and gardeners have used natural Bt. as an organic pesticide for more than 50 years. Bt. genes are now being genetically engineered into crops so that the plant produces toxins throughout most of its life.

Genetically engineered Bt. crops are being offered as a sustainable pest control strategy. However, the Bt. crops are neither ecological nor sustainable. They are not ecological because internalising toxin production in plants is not a toxic free strategy — it merely makes toxics internal to plants rather than applied externally. The ecological impacts of this strategy of internalising toxics have not been looked at, though indications are emerging that genetically engineered Bt. is harmful to beneficial insects such as bees and ladybirds.

The Bt. crop strategy is not a sustainable method for pest control because Bt. plants release toxins continuously. Constant long-term exposure of pest populations to Bt. encourages survival of individual pests that are genetically resistant to the toxin. As Margaret Mellon and Jane Rissler of the Union of Concerned Scientists state in their report "Now or Never":

> Over many generations, the proportion of resistant individuals in pest populations can increase, reducing the efficacy of the Bt. toxin as pesticide. If resistance evolves, Bt. toxins will cease to be effective both for the users of the new transgenic plants and those who have relied on Bt. sprays for decades. Scientists have estimated that widespread use of Bt. crops could lead to the loss of Bt's efficacy against certain pest populations in as far as two to five years (Fred and Bruce, 1998).

The primary justification for the genetic engineering of Bt. into crops is that this will reduce the use of insecticides. One of the Monsanto brochures had a picture of a few worms and stated, "You will see these in your cotton and that's O.K. Don't spray". However, in Texas, Monsanto faces a law suit filed by 25 farmers over Bt. cotton planted on 18,000 acres which suffered cotton boll worm damage and on which farmers had to use pesticides in spite of corporate propaganda that genetic engineering meant an end to the pesticide era. In 1996, 2 million acres in the US were planted with Monsanto's Bt. transgenic cotton called Bollgard, which had genes from the bacteria *Bacillus thuringensis* (Bt). The genetically engineered cotton generates a natural toxin

to kill caterpillars of their pest: cotton bollworm, tobacco budworm and pink bollworm.

However, cotton bollworms were found to have infested thousands of acres planted with the new breed of cotton in Texas. Not only did the genetically engineered cotton not survive cotton bollworm attack, there are also fears that the strategy will create super bugs by inducing Bt - resistance in pests. The question is not whether super-pests will be created, but when they will become dominant. The fact that Environment Protection Agency (EPA) of the U.S. requires refugia of non-engineered crops to be planted near the engineered crops reflects the reality of the creation of resistant strains of insects.

The widespread use of Bt. containing crops could accelerate the development of insect pest resistance to Bt., which is used for organic pest control. The genetically engineered Bt. crops continuously express the Bt. toxin throughout its growing season. Long term exposure to Bt. toxins promotes development of resistance in insect populations.

Due to this risk of pest resistance, the U.S. Environment Protection Agency offers only conditional and temporary registration of varieties producing Bt. The EPA requires 4% "refugia" with Bt. cotton i.e. 4% of planted cotton is conventional and does not express the Bt. toxin. It therefore acts as a refuge for insects to survive and breed, and hence keeps the overall level of resistance in the population low. Even at a 4% refugia level, insect resistance will evolve in as little as 3 - 4 years.

For Bt. corn, the suggested "sacrificial" refugia is as large as 3%. Thus, farmers have to make a major sacrifice to adopt the new miracle crops of genetic engineering. The building up of pest-resistance undermines the use of natural Bt. in organic agriculture. This is the reason that legal action against the US, EPA was filed in Washington by Greenpeace International, the International Federation of Organic Movements (world organisation of organic farmers, certifiers, producers, retailers, 650 members in over 100 countries), the Sierra Club, the National Family Farm Coalition, California Certified Organic Farmers, the Rural Advancement Foundation International (RAFI), the Institute for Agriculture and Trade Policy and over 20 organic farmers' organisations. The central demands of the petition was that the EPA cancels registration of all genetically engineered plants that contain the Bt. pesticide and that it refrains from taking new registrations. Furthermore, that the EPA completes an impact statement analysing the registering of genetically engineered plants that express Bt.

Engineering a toxin into a plant can have its own hazards. Plants engineered to manufacture their own pesticides can harm organisms other than their intended targets. Soil inhabiting organisms that degrade the organic matter containing the insecticidal toxins produced by the soil bacterium *Bacillus Thuringiensis* can be harmed by the toxin.

One of the most significant reasons contributing to the pesticide treadmill has been the death of beneficial insects, and the emergence of resistance. More than 500 species of insects have become resistant to conventional insecticides and there is empirical evidence that they can also adapt to Bt. toxins (Fred and Bruce, 1998).

In Australia, Bt. cotton acreage has been limited to below 20 per cent of

all cotton grown because of the risks of emergence of resistance. The Australian experience with commercial use of Bt. cotton in the summer of 1996-97 showed that Bt. expression can vary based on the genetic material planted and on environmental factors. A significant number of Bt. cotton growers experienced pest damage by H. armigeca (the Australian equivalent of the cotton bollworm) as high as fields with untreated non-Bt. cotton.

The failure of Monsanto's Bollgard cotton in large areas in the U.S. shows the risks of extrapolating from trials on small plots to large scale commercial planting. A second lesson from the 1996 U.S. planting is that it is not easy to force farmers to leave refugia at their own costs in order to manage pest resistance. The extra costs of leaving 20 per cent land to non-Bt. cotton to be sprayed with conventional insecticides should be internalised in assessment of the benefits of Bt. cotton.

Scientists have recommended that 50 per cent area be planted by non-Bt. cotton when farmers plant Bt. cotton (Fred and Bruce, 1998). If farmers should not plant more than half their acreage with Bt. cotton, why should they plant it at all?

As the example of the cotton crisis in Warangal in Andhra Pradesh shows, farmers who have lost control over their seeds, agriculture and knowledge and have switched to the mentality of technological fixes to ecological problems through miracle varieties or chemicals will maximise the use of what has been offered to them as a technological miracle.

The impact of Bt. cotton on Indian farmers and Indian agriculture can be even more serious than the impact of the hybrid cotton in Warangal or any other part of India. Besides this, the Bt cotton will have a direct impact on the practitioners of the Indian system of medicines. The cotton seeds, roots, flowers, leaves, oil and cotton is used internally as well as externally in different ailments in the Indian system of medicines.

The cotton seeds are used for increasing milk secretion; the use of Bt cotton seeds can cause serious health hazards to the mother and the child. Similarly the roots are used during the labour to enhance the uterine contracts. The ash of the cotton is taken to check bleeding from wound. The leaves are given as dyurative. The introduction of Bt cotton will have a dangerous effect on the traditional medical practices and the use of its seeds, leaves, roots, oil will be fatal for the patients.

India is the home of cotton diversity. We should use the biodiversity of cotton to our advantage to create ecological strategies of selecting pest resistance varieties, using integrated pest management and avoiding the risks of hazardous pesticides as well as the risks of genetically engineered crops. The risks are aggravated by the fact that Bt. cotton is patented. Since Bt. crops destroy alternatives, and are themselves treated as "intellectual property", planted Bt. cotton seeds would totally enslave the farmers to a single company.

The risks of monopoly

Monsanto has the largest stakes in Bt. Cotton, which it sells under the trade name of Bollgard.

In recent years, Monsanto has acquired Calgene, Agracetus, Dekalb, Delta

& Pineland, Asgrow & Holdens, Mahyco (Indian) which makes it the largest biotechnology corporation in the seed sector (see Table 2.1).

In India, Monsanto has set up a Joint Venture with MAHYCO, the largest Indian seed company in the private sector. Monsanto plans to market its Bollgard cotton through this Joint Venture. It has decided to unveil a limited launch of Bollgad in India by 1999 and a full scale launch in 2000 (Asian Age, 1998). They have set for themselves a turnover target of about Rs. 500 crore in the next five to seven years in India.

Monsanto's promotional literature does not inform farmers about the risks of Bt. crops. As Hendrik Verfaillie, the President of Monsanto, stated in an address to the Forum on Nature and Human Society at the National Academy of Sciences, Washington D.C. October 30, 1997 in describing Monsanto's Bt. Potato:

> "The bioengineered plant has been given genetic instructions which allow it to use sunshine, air and soil nutrients to make a biodegradable protein that affects specific insects and pest, and only those individual insects that actually take a bite of the plant... It spares the lives of the beneficial insects which previously would have been killed by broadcasting a broad spectrum insecticide."

This description is misleading in many ways. The use of genetic engineering to make transgene bt-plants has described as "giving genetic instructions to use sunshine, air and soil nutrients", a high dose toxin is described as a "biodegradable protein", and the impact is artifically restricted to insects "that take a bite of the plant", thus excluding the impact on bees that take the pollen, and organisms that eat the insects which have eaten the toxin. The impact of Bt. crops can be large because the toxin can travel up the food chain and is hence not limited to the plant and insects, which feed on it.

Chemical insecticides were pushed in the Third World on grounds that without them agricultural production is impossible. However, as the experience of Indonesia shows, a reduction of pesticides by 60 per cent contributed to an *increase* of rice yields by 13 per cent.

Like insecticides, insecticide producing plants which have been genetically engineered to produce Bt.-toxin could be another false miracle which sows the seeds of massive disasters.

Cost of the Bt *Technology*

Bt technology is not free of cost to the farmers. The farmers have to pay for the non-cotton gene inserted into the cotton genome. The fees that are charged to farmers are related directly to the benefits or saving made in planting the transgenic cotton varieties. It is generally presumed that Bt cotton if planted would significantly reduce the need for spraying insecticides and accordingly the technology fee has been related to the insecticide use.

Each farmer interested to plant Bt variety has to sign an agreement with the Company. In the case of purchase of Monsanto's transgenic products, one of the important conditions of the contract has been that the seeds can neither be saved for next year nor passed on to other cotton growers. The company

apparently intends to reap technology benefits for years to come by extending the duration of agreement.

It has been observed that the performance of Bt cotton is not always profitable. According to a study by Sutton (1998) it was not profitable to grow Bt cotton in Arkansas (USA) during 1997. The study involved two similar fields on the same farm at seven locations for comparing cost of production and net returns from Bt versus non-Bt cotton varieties. The study noted that the differences between the Bt and non-Bt fields were in the area of technology fees, cost of insecticides and their application, growth regulators and second harvest costs. In most Bt fields, the additional cost of seed, the necessity of using plant growth regulators, the technology fee and the need to make second pick were responsible for higher cost of production.

It is very clear through studies [like Sutton (1998)] that bollworm pressure is an important factor for determining the economical suitability for Bt cotton.

Study by Gibson et al (1997) compared the costs and returns associated with growing Bt cotton and non-Bt in Mississippi for two years. The study reveals that there was not much difference in the total cost of production. However, Bt cotton required more expenses in the form of fertilisers, fungicide treatments and the technology fees. The Table 3.3 provides the performance of Bt to that of non-Bt cotton in Mississippi (USA) in 1995-97. It is observed from the table that the amount spent on insect control together with the technology fee exceeds for Bt cotton in all the years and made it more expensive for the farmers. Thus the total cost for Bt crop exceeds on an average fifty percent more to that of non-Bt crop.

For the trials, the company has not charged any technology fees as such. However, for commercial sale of the seeds the company is certainly going to impose technology fees. In such situation, there will be tremendous pressure on the farmers and ultimately the very survival of farmers will be threatened. There is absolutely no difference in terms of total returns for Bt and non-Bt crops of cotton.

Genetically Engineered Crops Yields More: Myth or Reality?

It is argued that the yield from genetically engineered crops will be significantly higher than the normal hybrids and high yielding varieties or the open pollinated varieties.

TABLE 3.3
Performance of Bt vs Non-Bt Cotton in Mississippi 1995-1997

	1995		*1996*		*1997*	
	Bt	***Non*-Bt**	**Bt**	***Non*-Bt**	**Bt**	***Non*-Bt**
Lint yield kg/ha	1086	983	1002	950	1103	1009
Insect Control US$/ha	176	232	157	144	209	204
Bollgard Fee US$/ha	204		61		133	
Total Cost US$/ha	**380**	232	**218**	144	**342**	204
Total Return US$/ha	1176	1176	1218	1218	1239	1239

Source: *ICAC, June 1998.*

The failure of GE crops to yield has been reported from all over the world. The Mississippi Seed Arbitration Council has ruled that Monsanto's Roundup Ready Cotton failed to perform as advertised in 1997 and recommended payments of nearly $2 million to three cotton farmers who suffered severe crop losses. The University of Arkansas study

showed that on average Bt cotton yielded fewer pounds and lower income per acre (Union of Concerned Scientists, 2000).

In his testimony in Bija Panchayat – Seed Tribunal at Bangalore in September 2000, Percy Schmeiser a Canadian farmer, who was sued by Monsanto for cultivating Bt canola, informed that not only the yields of genetically engineered canola was very low but also the quality was poor.

The rush to expand the area under GE crops in India is largely related to the failing fortunes of the biotech industries in the US and Europe. The yields in all the trial plots were found to be low as compared to what the company promised. A comparison of the local hybrid variety cultivated and *Bt* shows that the yield from both the crops was more or less same. Table 3.4 shows the comparison of Bt and non-Bt yield.

> Before you could buy the canola seed from Monsanto you have to sign a Licence. And in that Licence you gave up many of your rights as a farmer. You gave your rights up that you could not use the seed from that crop in the following year, you have to sell all your seed, you have to buy seed from Monsanto, you have to buy the chemical from Monsanto. Worse than that you have to also sign that if you violated your contract that they could fine you, you could not say one word, that they can say anything about you. In addition to get seed from Monsanto, you also have to pay a technology charge which is $15 an acre. So basically they have complete control over you with regard to the seed that you bought. It is just like renting the seed. And you have to buy back next year.
>
> ***Percy Schmeiser,*** *Canadian Farmer*

The performance of Bt with respect to other non-Bt cotton in some of the trial sites shows no good results. It has been observed that in almost all the sites, farmers reported that except for some protection from bollworm nothing much has benefited them. The cost of cultivation has also worked out to be same for all the trial farmers.

Studies undertaken in US during 1999, where 50% of the soybean crop came from genetically modified glyphosate-resistant soybeans, farmers reported yield losses and increased costs. One of the review of more than 8,200 soybean trials found the "yield drag" of the top varieties of GM beans compared with conventional varieties to be 6.7% (Charles Benbrook, 1999). The yield drag and Monsanto's technology fee practically impose tax on the income of farmers who cultivate genetically modified soyabean.

In a study, which was initiated on the requests of producers regarding yield related questions about Roundup Ready Soybean in 1997, carried out by Nebraska University Institute of Agriculture and Natural Resources headed by NU agronomist Roger Elmore reported in June 2000 that roundup ready soyabeans yielded 6% less than their closest relatives and 11% less than high yielding conventional soyabeans. Table 3.5 show the Roundup Ready and Conventional Variety Yields.

TABLE 3.4

Actual yield reported by the farmers in the Trial Plots for Bt Cotton (1998-99)

Name of the Farmer & Location	Bt *Yield/acre*	*Non*-Bt *Yield/acre*
1. Mr Lehri Singh, Hissar, Haryana	745 Kg	880 Kg
2. Mr Harpal Singh, Sirsa, Haryana	5 Kg	200 Kg
3. Mr Surendra Singh Hayer, Punjab	Poor yield	250 Kg
4. Mr Mahalingappa Shankarikopp, Haveri, Karnataka	700 Kg	700 Kg
5. Mr B V Nunjundappa, HBHalli, Karnataka	Poor yield	Not performed well
6. Mr Karelli Bakka Reddi, Ranga Reddy, Andhra Pradesh	50 Kg	150-200 Kg
7. Mr Bansi lal Lakhmi, Khargoan, Mahdya Pradesh	12 Kg	300 to 400 Kg

Source : *Compiled from Primary Survey of Trial Sites by RFSTE team.*

TABLE: 3.5

Round Up Ready & Conventional Variety Yields by State, 1998

States	*Per cent Yield Drag per Acre*		
	Trial Mean	*Top 5 Varieties*	*Top Variety*
Illinois	+3.4%	0.0%	0.0%
Iowa	-6.6%	-6.3%	-9.1%
Michigan	-3.0%	-6.8%	-10.3%
Minnesota	-7.6%	-8.2%	-6.8%
Nebraska	-12.1%	-10.8%	-9.1%
Ohio	+3.3%	-6.0%	-5.8%
S Dakota	-10.2%	-7.4%	-8.9%
Wisconsin	-2.8%	-3.5%	-3.4%
Average	-5.3%	-6.1%	-6.7%

Source: *Charles Benbrook, 1999.*

Decline in Planting Area of Bt crops

According to World Watch Institute's Report 2000 there has been a decline of about 25% planting area of GM crops in the US. In January 2000, the planting undertaken by farmers in United States for Bt corn declined to 24% and Bt cotton to 26%.

A study by North Carolina State University in March 2000, reveals that damage to cotton bolls in Bt crops from stink bugs increased by a staggering 430% compared to conventional cotton. Based on these results US southern states had been prohibited from planting more than 50% of their acreage to Bt crops because of the risk of the rapid development of pest resistance which threatens to make the technology impotent.

Refugia Maintenance Strategies: At whose cost ?

Responding to Monsanto's amendment request of June 1999 and November 1999, United States Environmental Protection Agency's Biopesticide and Pollution Prevention Division informed that 20% and 50% refugia must be grown in Bt corn and Bt cotton growing areas (Letter from USEPA). It has been also reported in other studies that the expression of Bt in cotton varieties is not high enough to kill most of the cotton bollworms, allowing 10 – 40% of insects to survive. This requires a huge refuge to create a large enough susceptible population for mating with survivors.

With the advent of mass planting of transgenic crops, many of the natural refuge where susceptible larvae thrive will disappear. Therefore, the strategy of non *Bt* plant refuges in which the *Bt* vulnerable insects can continue to multiply, thus reducing the rate at which the *Bt* resistant insects dominate the population. Many companies selling transgenic seeds, including Monsanto, have accepted this refuge strategy.

The refugia need to constitute 5-40% of a given crop. "With the bollworm, the key strategy is refugia, host plants where the insect can escape exposure to *Bt* protein. Non-selected populations that develop on these refuges help dilute and suppress any resistance genes that may develop in the Bollgard fields. The bollworm has a multitude of hosts – both wild and crop plants. With Bollgard, resistance management is taken even further by requiring growers to plant refuges with cotton that does not contain the Bollgard gene. When both the natural and mandated refuges are combined, resistance development in the bollworm can be delayed significantly." Therefore, Bt technology is for corporate farmers with industrial agriculture.

80% of Indian farmers who are small and marginal and having medium land holding can not afford to put aside land to have refugia to delay resistance.

This also shows that *Bt* cotton will not increase yield, though it is not engineered for that, nor it would help in reducing pesticide use. The *Bt* technology has already proved to be a unreliable, expensive technology and has also failed to control bollworms, rather it has developed resistance to *Bt* toxin. Thus Bt technology in India can never be a reliable technology for the small and marginal farmers of India.

The Australian experience, as discussed earlier, showed a significant number of growers had fields of *Bt* cotton in which the damage due to *H. armigera* was similar to that in untreated non-*Bt* cotton.

The basic questions that are however not being raised in the U.S. debate are:

1. Who bears all the costs of resistance management, the farmer or Monsanto?
2. Is not the really sustainable option of using organic methods which would reduce the ecological and economic costs of insecticides without creating new costs of genetically engineered seeds, royalties, technology fees, continued insecticide use and the risks of the emergence of resistance to Bt.

> Monsanto did an aggressive campaigning claiming that the genetically engineered rape seed provided by them was more nutritious, had high yield and would consume less chemicals. But this was not entirely true. Farmers who used it found that it was not what was claimed but instead had become a super weed, destroying other varieties through its resistance to Monsanto's branded herbicide *Roundup*.
>
> This contamination of seed has now appeared in the wheat, barley. It has also ruined the sales of organic rapeseed products in Europe. The Alberta University has now found that there are 3 genetically manipulated genes in the GE Canola plants. Organic farmers are now convinced that the MNCs are all out to destroy them, as they are not buying the chemical fertilisers and pesticides. It has become a major problem in Canada.
>
> **- Percy Schmieser,** Canadian Farmer

Reduced Use of Insecticides, Pesticides: the Truth

Genetically engineered crops are developed to reduce the chemical application to the plants. It has been observed that the use of pesticides, weedicides and herbicides has been increasing tremendously all over the world. To reduce this dependence on agri-chemicals and to minimise the damage to environment through these poisonous substances, genetically engineered crops were thought of as an alternative to reduce the chemical usage in agriculture.

According to industry, the promise of transgenic crops inserted with Bt genes is the replacement of synthetic insecticides, which is at the moment used to control insect pests. However, it has been found that there is no decline in usage of synthetic pesticides and insecticides in the Bt cultivated areas.

Insecticides sprays were still required in the genetically engineered crops to control pests other than Lepidoptera not susceptible to the endotoxin expressed, as most crops have a diversity of insect pests (Gould, 1994). On the other hand, instead of reducing the agri-chemical dependence, new problem of pests developing resistance to the ever expressing endotoxin from the genetically modified crops.

Monsanto company admits that bollworm larvae greater than ¼ inch long or 2 to 4 days old are difficult to be controlled with Bollgard alone (see promotional material of Monsanto). It recommends applying supplemented insecticide treatment and further recommends the farmers that "if sufficient larvae of this size are present you may need to apply supplemental treatment at intervals" (Monsanto Company, 1996).

In another instance, the pesticide effect of the engineered Bt was not sufficient to kill off all pests throughout the season as Monsanto promised. Dr Mae-Wan Ho, of the UK's Open University, attributes this failure to unpredicted changes in the behaviours of the Bt gene. In 1997, 20 % of the first commercial crop of Roundup Ready cotton suffered deformed bolls and bolls dropping off early.

In one out of the three regions which the United States Department of Agriculture (USDA) studied total chemical treatments for all the cotton pests were actually 53 % higher for adopters of Bt cotton than non-adopters (WWF Report, March 2000).

An analysis by the Pesticides Trust on behalf of Greenpeace argues that the introduction of herbicide resistant varieties will alter the pattern of herbicide use but will not change the overall amounts used. If it leads to greater use of glyphosate this will damage other crops and have potential adverse effects on wildlife, including beneficial insects such as ladybirds. The analysis further shows that the compounds can remain active in the soil for long periods and can contaminate water (International Agricultural Development, 1998).

The actual pesticide sprays by the farmers at various trial sites in India, during the first round of illegal trials of Bt cotton revealed that the use of pesticides has not at all stopped for Bt crop. Pesticide sprays ranging from as high as 12 to 15 in one of the trial fields in Haryana to a minimum of three in the trial fields have been observed. According to Mr Basavanappa s/o Shri B V Nanjundappa in Hagari Bommanahalli Taluk, Bellary district, the number of sprays in all the three test plots of Bt and non-Bt has been almost same and incurred around Rs 6700 for chemicals sprays and fertilisers. This amount is almost spent by all other conventional/hybrid cotton growers on purchase of chemicals and fertilisers in that part of the State. Table 3.6 gives the number of sprays farmers used on the Bt plots during the trial.

Contrary to the claim of Monsanto about the reduction of chemical sprays, farmers had to revert to chemical spraying inspite of built-in insecticidal properties in the Bt cotton.

Increased Costs to Farmers

With the introduction of genetically modified crops, per acre cost of cultivation will tremendously increase with increase in added costs in terms of seed cost, technology fees, and use of chemicals. In the present situation with internal inputs organic agriculture the added costs are almost negligible except for the cost of seeds, which most of the farmers saving their seeds and using them for cultivating in the following season. Other inputs are also provided on farm. Once Bt

TABLE 3.6

Number of Chemical Sprays on Bt Cotton by the trial farmers (1998-99)

Name & Location of Farmer	*Number of Sprays on Bt Crop*
Mr Surinder Singh Hayer, Punjab	5 to 6 times spray of chemicals.
Mr Lehri Singh, Hissar, Haryana	3 times spray of chemicals.
Mahyco R D Centre, Gurgoan, Haryana	3 to 5 spray of chemicals.
Shri B V Nanjundappa, Bellary, Karnataka	4 times spray of chemicals.
Shri V Thirupalliah, Kurnool, A P	4 times spray of chemicals.

Source: *Compilation from RFSTE Primary Survey, 1998.*

cotton is cultivated, all these costs will appear and the farmer will get into serious financial troubles.

An estimation of additional burden which the farmer has to bear for switching over to Bt cotton from conventional variety is nearly nine times more in terms of seed cost, technology fee of nearly US$ 80 per hectare and more spending on pesticides and chemicals. Most calculations used by Monsanto compare the costs incurred by the farmers of developed countries. The estimates for Indian farmers are totally different and have profound impact when the comparisons are made in Indian context between cultivation with genetically engineered seeds and cultivation under organic conditions.

The genetic engineering option is projected as leading to lower chemical use and hence economic benefits by comparing it to chemical intensive, large scale industrial monocultures instead of ecological organic agriculture which is perhaps the only real alternative. However the comparison of genetically engineered crops that should be made is not with chemical intensive agriculture but with ecological regenerative agriculture. In addition to the increased cost of chemicals, the shift from ecological agriculture to genetic engineering also leads to increased costs of seed, including technology costs, which are never mentioned when the economic benefits of transgenic crops are assessed.

Thus, from Table 3.7, it is evident that the ecological farming has no expenditure in terms of seed cost, technology fee imposed on the seed and the cost of pesticide. Once there is shift in the farming system, from ecological to that of genetically engineered farming, the farmer has to bear Rs 10500 per acre additional cost apart from other input costs such as labour costs.

As per 1997-98 figures the total area under cotton in India is 214 lakh acres. Therefore, if whole of the cropping shifts to genetically engineered cotton then nearly Rs 16050 crores on pesticides and Rs 22470 crores on entire cotton cultivation will be the added costs compared to the ecological option of internal input agriculture.

The false comparison with chemical/ industrial agriculture rather than with ecological organic agriculture is used to create the illusion of sustainability of genetically engineered crops.

TABLE 3.7

Comparison of costs in Ecological farming and Genetically Engineered farming system for Cotton crop in India (per acre)

Inputs	***Ecological Farming***	***Genetically Engineered Farming***
Seed Cost	Nil	Rs 550
Technology Cost	Nil	Rs 2000
Pesticide Cost	Nil	Rs 7500
Total Cost of Cultivation/acre	Nil	Rs 10050

Source: *Compiled from RFSTE Primary Survey, 1998*

TABLE 3.8

Average Projected 2000 Insect Control : Costs and Damages ($/acre) of Bollgard Versus Conventional Cotton for North Carolina Producers

Items	***Bollgard***	***Conventional***
Average Technology Fee [a]	19.14	0.00
Insect Control Cost [b]	5.63 (0.75 apps)	18.98 (2.53 apps)
Insect Damage [c] (% damaged bolls)	0.00 (4.47 %)	6.08 (5.25 %)
Additional Scouting Fees [d]	2.50	0.00
Total	($ 27.27)	($ 25.06)

Source: *Charles Benbrook, 1999.*

a Technology fee varies according to seed rate and row spacing.

b Pyrethroid = $ 5.50 per acre; application = $ 2.00/acre

c Damage:1 % boll damage equals approx 12 lb lint per acre; cotton = $ 0.65/lb

d Scouting requirements for Bollgard typically exceed those needed for conventional cotton.

5. Socio-Ecological Aspects of GE Revolution

Genetic Pollution

Genetic engineering is creating new forms of pollution identified as genetic pollution. Across the world evidences are emerging about the reality of threat from this new form of pollution. The nature of genetic pollution is different from that of chemical pollution in the sense that there is no abatement for this type of pollution.

The risks associated with genetic pollution arise from a number of aspects of genetic engineering. The transgenic organisms are modified organisms with a foreign gene which behave differently in the ecosystem. The ecological impacts of such organisms are a function of the explicit properties of the added genes, the effects of new combinations of genes and specific environmental situations.

Transgenic organisms also carry risks because exotic genes are also introduced through the use of viruses and plasmids as vectors, which themselves can create ecological risks. Transgenic crops contain antibiotic resistance markers that carry the risks of antibiotic resistance spreading.

According to evidence presented by the Union of Concerned Scientists, there are already signals that the commercial-scale use of some transgenic crops pose serious ecological risks and do not deliver the promises of industry (see the Box below).

In the United States Bt crops are registered as insecticides. These registrations are conditional and expire in 2000 - 2001. The insecticidal Bt-toxins, isolated from *Bacillus thuringiensis* are often engineered into plants in a pre-activated form, and are already known to be harmful to bees directly, and to lacewings further up the food chain. A recent study in Switzerland found that lacewings, which prey on corn pests, suffered maldevelopment, increased mortality when fed with corn borers raised on Bt crop (Hilbech, et al, 1998).

Field Performance of Some Recently Released Transgenic Crops

Transgenic Crop Released	*Performance*	*Reference*
1. Bt transgenic cotton	Additional insecticide sprays needed due to Bt cotton failing to control bollworms in 20,000 acres in eastern Texas	The Gene Exchange, 1996; Kaiser, 1996
2. Cotton inserted with Roundup Readgô gene	Bolls deformed and falling off in 4-5 thousand acres in Mississippi Delta	Lappe and Bailey, 1997; Myerson, 1997
3. Bt corn	27% yield reduction and lower Cu foliar levels in Beltsville trial	Hornick, 1997
4. Herbicide resistant oilseed rape	Pollen escaped and fertilised botanically related plants 2.5 km away in Scotland	Scottish Crop Research Institute, 1996
5. Virus resistant squash	Vertical resistance to two viruses and not to others transmitted by aphids	Rissler, J. (Personal communication)
6. Early FLAVR-SAVR tomato varieties	Did not exhibit acceptable yields and disease resistance performance	Biotech Reporter, 1996
7. Roundup Ready Canola	Pulled off the market due to contamination with a gene that does not have regulatory approval	Rance, 1997
8. Bt potatoes	Aphids sequestered the Bt toxin apparently affecting coccinellid predators in negative ways	Birch et al., 1997
9. Herbicide tolerant crops	Development of resistance by annual ryegrass to Roundup	Gill, 1995

Monsanto's genetically engineered "Bollgard" cotton or Bt-cotton has genes from a bacteria engineered into it so that the plant produces its own pesticide contrary to Monsanto's claim. Bt-cotton is not "pest-resistant" but a pesticide producing plant. The severe ecological risks of crops genetically engineered to produce toxics include the threat posed to beneficial species such as birds, bees, butterflies, beetles which are necessary for pollination and for pest control through prey predator balance. Nothing is yet known of the impact on human health when toxic producing Bt. crops such as potato and corn are eaten or on animal health when oilcake from Bt-cotton or fodder from Bt-corn is consumed as cattle feed. Further, while pesticide producing plants are being offered as an alternative to spraying pesticides, they will in fact create the need for more pesticides since pests are rapidly evolving resistance to genetically engineered Bt-crops.

Research at the Scottish Crop Research showed that lady birds fed on aphids which were fed on transgenic potatoes laid fewer eggs and lived half as long as lady birds on a normal diet (Brich et al, 1996/97).

The latest research that has sent shock waves throughout the scientific and environmental community is the finding by the Cornell scientists that the Monarch butterfly *Danaus plexippus* was killed by ingesting milkweed leaves dusted with pollen from Bt cotton (Losey et al., 1999).

These impacts on non-target species falsify the claims that the Bt toxin in Bt cotton only effects the cotton bollworm. If such Bt cotton is allowed to spread across the country its impact on diverse species will be similar to the devastating impacts of pesticide use. In addition, the risks of transgene moving into other plants will have the added risks of genetic pollution and the destruction of our biodiversity.

Transgenic plants have been genetically engineered to contain traits from unrelated organisms. The spread of transgenic crops threatens crop genetic diversity by simplifying cropping systems and promoting genetic erosion. The potential transfer of genes from pesticide resistant crops to wild or semi-domesticated relatives may create new super weeds.

The wide spread use of Bt containing crops could accelerate the development of insect pest resistance to Bt, which is used for organic pest control.

There is serious mismatch between the mindset of genetic engineering biotechnology and the reality of the new genetics. A summary is given below to highlight the mismatch between the two :

Genetic Engineering Mindset	***Reality of Scientific Findings***
1. Genes determine characters in linear causal chain: one gene gives one function.	Genes function in complex network; causation is multidimensional, nonlinear and circular.
2. Genes and genomes are not subject to environmental influence.	Genes and genomes are subject to feedback regulation.
3. Genes and genomes are stable and unchanging.	Genes and genomes are dynamic and fluid can change directly in response to the environment and give adaptive mutations to order.
4. Genes stay where they are put.	Genes can jump horizontally between unrelated species and recombine.

The Taco Shell Case

Taco shells are a very popular food in the US, and many brands are found in all supermarket shelves. Our coalition of groups against GE foods, called *Genetic Engineering Food Alert,* tested various foods for contamination with genetically engineered Bt corn. We found that the Bt corn that had been cleared **only** as animal feed had infiltrated in the human food. This Bt corn had not been approved for human consumption, as it is toxic to humans due to the presence of allergens. The genes that were found in Taco shell were of Cryonine gene, which does not degrade in the gut of humans. This shows that the regulatory bodies don't work.

- Ellen Hickey, USA

Monsanto's technology destroys beneficial biodiversity and create superpests both through wiping out pest predators and by creating pests, which are resistant to pesticides. While Monsanto's pesticide producing Bt. crops are not based on the terminator technology, which terminates germination of seed so that farmers cannot save it. However, they are in an ecological sense terminator, which terminates biodiveristy and the possibilities of ecological and sustainable agriculture based on the conservation of biodiversity.

The ecological impact of Bt-cotton cannot be assessed on the basis of a 3-month trial. The trial needs to be carried out over 2-3 growing seasons and impact needs to be assessed on all organisms, including soil microorganisms which have been known to be killed by the toxics in Bt-crops. To get the full-ecological impact of biodiversity destruction and genetic pollution caused by genetically engineered crops, the following steps are necessary :

- a full biodiversity assessment of the ecosystem in which the GMO is to be introduced.
- impact of genetically engineered crop on diverse species including pollinators and soil microorganism
- risks of transfer of genetically engineered traits to non-engineered crops through horizontal gene transfer and pollination.

Indian Trials Lack Ecological Impact Assessment

None of the above referred steps for ecological risks of GMOs have been carried out in Monsanto's illegal and unscientific trials with Bollgard cotton during 1998, in India.

When Monsanto states that they have had 93% success they are referring to agronomic performance, not to ecological safety. Further, since the Bt-technology is aimed at pesticide production, not yield increases, Monsanto is deliberately distorting facts when it refers to yield increasing characteristics of Bollgard cotton.

The wrong committee asked Mahyco-Monsanto to generate data on pest load, performance in terms of yield and fiber quality, to compare the insect damage on the boll shedding and retention for Bt cotton. There has been no concern to monitor the impact of transgenic crops on the surrounding flora and other relevant ecological aspects.

Containment - the Need

The absence of containment measures during the Bt cotton field trials include:

- No safegaurds for the prevention of leaf fall from Bt cotton entering the soil ecosystem;

- No safegaurds against soil microorganisms being adversely impacted;
- No netting to prevent insect pollinators from approaching the Bt cotton plants to prevent gene transfer through pollination;
- No steps to prevent non-target species from feeding on the Bt cotton and transferring the transgenic material in to the larger environment through the food chain;
- No safegaurds to ensure that the stems, roots, leaves, cotton fibre, cotton seeds were collected at the end of the harvest and destroyed;
- No precaution whatsoever is on record to provide for post harvest segregation. The Bt cotton produce harvested by farmers was mixed with the produce harvested from non-GE cotton and sold in the local market.

Through these multiple flows and interactions with the environment the Bt cotton trials are a deliberate release of a GMO into the environment and not "contained" experiment.

The lack of containment of field trials implies that the GMO and the transgene contained in it can escape in to the larger environment through pollination, food chains and marketing chains. Unlike non-living material, GMOs multiply and reproduce. In the words of Ms Elaine Ingham (Professor at the Department of Botany and Plant Pathology, Oregon State University, USA) any engineered organism to be released into the real world, free from the controlled laboratory situation, must be treated as the potential hazard that it is. The biotechnology industry needs to step back and make certain that the biological potential of organisms being altered, both before and after alterations, is recognised and understood. After all, organisms are capable of reproduction and increasing in number and spreading. Human produced chemicals may have posed problems to the environment but at least chemicals, whether organic or inorganic, did not reproduce. One molecule of a problem chemical remained one molecule and did not replicate to become a million problems.

In case of biological material, tiny amounts of material can be multiplied. Bacterial multiplication takes places at phenomenally high rates.

A comparison of the field trial design with actual field practice and required ecological trial parameters as specified by biosafety regulations is presented in Table 3.9.

Isolation Distances

Isolation distances are scientifically important while undertaking trials with transgenic crops since, the transgenic material cannot be treated as if it were a chemical matter rather than biological matter. Biological matter can not be equated to chemical matter. Because of the reproduction and multiplication inherent to living organisms, GMO releases can have irrepressibly damaging impact on the environment. The inherent tendency of biological organisms to multiply and reproduce and interact with other species implies that what begins with a small number of plants or bacteria can become a major invasion or epidemic. The example of Parthenium substantiates the point. A few seeds of Parthenium which came in as contaminants in a wheat consignment of PL480

a few years ago, today covers millions of acres of productive land in the country and causes allergies to millions of people.

TABLE 3.9

Comparison of the Field trial design with Actual Field Practice and Ecological trial parameters as specified by Biosafety Regulations

Trial Design	*Actual Field Practice*	*Ecological Trial Parameters*
• Experimental design for the quadruplicate trials of Bt cotton would be in field space of about 1394 sq meters.	• 1800 sq meters of plots were used.	• Impact of leaf fall on soil organisms. • Impact on Non target species. • Emergence of resistance.
• Experimental plots containing transgenic Bt cotton plants should be surrounded by an isolation distance of 5 meters with no plantations.	• No isolation distance. Instead crops were planted in between the plots.	• Experimental plots in total isolation. Series of experiments to be conducted in contained environment. • Assessment of the impact on other crop and plant species dominant in the region.
• Comparative assessment of lepidopteran pest load in randomised Bt, non-Bt field along with non-Bt foeld plantations due to host preference. • Performance of the Bt and non-Bt hybrids for yield and fiber quality.	• No data available. • Manipulation in comparing the yield of Bt and non-Bt cotton by opting for its own inferior variety and not taking the most common variety cultivated by the farmers in the region.	• Integrated analysis of flora and fauna in soil and agroecosystem within a distance covered by pollination potential. • Local cultural practices should not be manipulated and comparison should be made with the most commonly grown variety of the crop.
• Keep full account of the transgenic materials and seeds in the transgenic plots and use all transgenic material in a contained environment.	• Free sale of the Bt cotton produced mixed with normal cotton produce in the market by the farmers. No precaution of containment.	• Complete destruction of the material/produce obtained from the trials.
• All materials, like quantities of transgenic Bt cotton seeds produced, transgenic cotton produce etc after experimentation be reported to the government.	• Taluk level concerned government departments unaware of the experimentation and did not receive any material or produce of the trangenic Bt cotton.	• All concerned committees at all levels of institutional hierarchy should be well informed about any trials with the genetically modified organisms in the field.
• Ensure company authorised personnel permitted to visit experimental sites.	• Mahyco organised *kshetra utsav* for publicity of the Bt cotton among other farmers of the region surrounding the trial fields.	• While in research conditions all the results should be open and accessible to the interested citizens of the country.
• Ensure adherence to Recombinant DNA guidelines of the Government of India.	• No adherence to the guidelines laid by the Government of India.	• Strong biosafety regulations needed. • More public participation needed.

Source: *Compiled from Primary Survey, Biosafety Guidelines and Rissler & Mellon (1996).*

Pollen escape cannot be equated with crossing. Hybridisation and pollen flow are two separate things. Hybridisation is species specific. Therein also the need to list all the relatives of cotton with which the *Bt* Cotton could hybridise with. Such is the nature and extent of research and study that needs to be undertaken before any activity even remotely resembling a commercial application can be allowed. Many experiments on pollination in different ecosystems need to be carried out in different universities and research institutes and not by commercial agencies to assess pollination distances for the risks of gene flow of transgenic material.

Ann Clark, an agronomist at the University of Guelph in the province of Ontario, was quoted as saying, "Canola pollen can move up to 8 kilometers; (pollen from) corn and potatoes, about 1 kilometer : Wind is only one of the ways pollen moves. Canola pollen, for example, is carried by pollinators" (Ann Clarke, 1998).

GMOs released into the environment without full safeguards and containment measures therefore automatically translate into a deliberate release and a large-scale process at the biological and ecological level. In the domain of genetic pollution and ecological impacts of GMOs, the matter of scale relates to ecological linkages and ecological impacts and not the initial area planted or the initial number of GMOs introduced since the GMOs and their transgenes can spread and multiply.

Environmental protection cannot be ensured on the basis of "beliefs" of adequate protection based on flimsy premises. Such protection has to be objectively ensured and that is the purpose of environmental laws.

If genes escape from genetically engineered (GE) crops, they can spread and multiply and lead to biopollution of the other crops and biodiversity. It is the clear absence of any containment measure in the release of transgenic plants through an open experiment in the field that poses serious ecological risks that be highlighted and prevented in the public interest.

The five meters distance is definitely not a safe and clear isolation either in the context of preventing genetic pollution through gene flow via pollination or preventing genetic pollution through the food chain.

The so-called buffer zone of 5 meters isolation distance is not a containment measure in any ecological sense for the trials of Bt cotton in India:

Firstly, it does not ensure containment by prevention of non-target species feeding on the plants, plant parts having an impact on soil ecology and soil organism and plant products being sold in the market.

Secondly, there is arbitrariness throughout the process of designing the scientific basis of the trials on the actual isolation distance required.

The determination of what would be a safe isolation distance for different genetically engineered crops should be made by independent ecological studies on different crops and their pollinators. The minimum isolation distance for GMO trials should be based on the isolation distance required to be maintained during seed breeding to maintain genetic purity of seeds.

According to the seed laws of the US pertaining to cotton to maintain genetic purity, a distance of 1920 ft. has to be maintained, this stipulation is further increased to 2640 ft. in hybrids and in the case of GMOs it is even higher i.e. above 3000 ft.

During the trials the isolation distance has been reduced to 5 meters "although seed certification norms have established 30 mts.". This arbitrary change in prescribed isolation distances for seed breeding has endangered the environment and violated the laws for preventing such risks.

The isolation distances would need to be higher than the isolation distances specified in seed certification laws since as mentioned earlier pollen transfer and crossing are not the same things.

The pollen flow from the transgenic Bt has not been contained because the so-called isolation distance used has been arbitrarily fixed and is totally inadequate to prevent pollen escape. It is important to point out that pollen carriage can be everywhere and anywhere. It does not have to always result in crossing between sexually compatible species. This fact is highlighted by the example of the killing of the Monarch butterfly from pollen dust from Bt corn depositing on milkweed on which the butterfly feeds.

Thirdly, since hybridisation and cross pollination increase from natural to hybrid, and hybrid to GMOs, the buffer zones for GMO trials need to be higher than isolation distances used for hybrid seed breeding. As Afzal and Khan observe "...the percentage of natural crossing was slightly higher in the case of American cottons as compared to local..." Further a paper in the scientific journal *Nature* records that transgenic plants are thirty times more promiscuous than conventional seed plants (Bergelson, et al, 1998).

Fourthly, even if the 5 meters was maintained, it is not an adequate safeguard. In such a situation the trial cannot be called "contained" as pollen can travel much further than 5 meters. A study by the National Pollen Research Unit in Scotland shows that the wind can carry viable pollen hundreds of kilometers in 24 hours. The study found that GM oilseed rape pollen had been carried three mile by bees and nearly 500 ms by air in 24 hours. The environment minister of UK, Mr. Micheal Meacher has admitted that the bees which may fly upto 9 kms in search of nectar can't be expected to observe a 'no fly zone', they even do not obey the 200 meters 'no fly zone' as currently required in UK regulations. Current trial plots where GM crops are grown have a buffer zone of 200 meters which is considered inadequate. As reported by Reuters World Report, BBC's News night programme on Wednesday, 29th September 1999 stated, that modified genes were found in pollen samples collected upto 4.5 kms from a field of GM oilseed rape in the Central England County of Oxfordshire. This was atleast 20 times over a limit set by the Labour Government of just 200 meters. Therefore, in the context of this evidence the MAHYCO calculations on gene flow are clearly totally inadequate. The 5 mts required by DBT, as isolation distance does not isolate the *Bt* trial field from its environment and other species.

Emergence of Pest Resistance

The engineering of the genes for the Bt toxin into plants implies that high dose toxin is expressed in every cell of every plant all the time. Long term exposure to Bt toxins promotes development of resistance in insect populations. This kind of exposure could lead to selection for resistance in all stages of the insect pest on all parts of the plant for the entire season.

For cotton, the emergence of Bt resistant strains of budworms and bollworms poses a real risk once this historically effective pest control agent loses its effectiveness.

Further, since the Bt toxin in Bt Cotton is released in every cell and every part of the plant it has the impact of making pests resistant to the Bt and hence creating 'superpests', which will require more pesticide use instead of reducing pesticide use.

Insects were found to develop resistance rapidly to the transgenic plants with built-in biopesticide, when exposed to the toxin. This has been the problem with the Bt cotton crop at Texas.

The wide spread use of Bt containing crops could accelerate the development of insect pest resistance to Bt, which is used for organic pest control. Already eight species of insects have developed resistance to Bt toxins including diamond black moth, Indian meal moth, tobacco budworm, Colorado potato beetle and two species of mosquitoes (Altieri, 1998).

According to the industry the promise of transgenic crops inserted with Bt genes is the replacement of synthetic insecticides used to control the insect pests. Since most crops have a diversity of insect pests, insecticides will still have to be applied to control pests other than Lepidoptera not susceptible to the endotoxin expressed by the crop. On the other hand several Lepidopteran species have been reported to develop resistance to Bt toxin in both field and lab tests, suggesting that major resistance problems are likely to develop in Bt crops which through the continuous expression of the toxin create a strong selection pressure (Tabashnik, 1994).

Development of Antibiotic Resistance

The first test under the FDA's voluntary review system came in 1994, when the agency approved the Flavr Savr tomato, a fruit genetically altered to stay firm during shipping. It proved to be a flop in the market and did not get acceptance from the consumers.

At the same time, Monsanto developed a genetically modified soybean that could resist the company's best selling weedkiller—Roundup. The herbicide destroyed weeds but spared the genetically altered crop—reducing the need for weeding the crop while boosting Roundup sales.

Simarly, Ciba-Geigy, now part of Novartis, produced a corn with an insecticide from Bt bacteria built into every leaf and kernel to kill the European corn borer.

One concern about such products was that antibiotic resistance genes, now standard in genetically engineered plants, could be taken up by bacteria, creating antibiotic resistant microbes. While others believed that the widespread use of Bt crops might create superbugs—pests no longer susceptible to Bt insecticides.

Disruption of Food Chain

The potential of Bt toxins moving through food chains poses serious implications for natural biocontrol in agroecosystems.

Scientists apprehend that the tests carried out to assess safety of genetically

modified crops "may be insufficient" for new crops in development. According to Dr Andrew Chesson of Aberdeen's internationally famous Rowett Research Institute, "tampering with the genetic make-up of crops could produce new plant chemicals which may not be spotted by traditional checks".

Natural enemies could also be affected directly through inter-trophic level interactions. Evidence from studies conducted in Scotland suggest that aphids were capable of sequestering the toxin from Bt crops and transferring it to its coccinellid predators, in turn affecting reproduction and longevity of the beneficial beetles (Birch et al. 1997).

The entry in the food chains is multidirectional. It could be from the milch cattles who are fed on GM crops, like the crushed GM rape-seeds, and any dangerous chemicals could therefore enter the human food chain. GM foods are being forced into the food chain without adequate safety tests.

Social Resistance to Crop Genetic Engineering

There has been global rejection of genetically engineered foods.

In early September 2000, Greenpeace activists were acquitted from causing criminal damage to the standing G.M. crops in U.K. There are conflicts arising between European Union and the United States over the safety and the need for the genetically engineered agricultural products since 12 years. There is demand all over the Europe for segregating the genetically modifies crop and non-genetically modified crop supplies in the market. Small farmers who are engaged in organic farming are not accepting GE crops so as to avoid pollution from genetically modified seeds. Consumer response has led to decline in share price of companies dealing with GM crops. This has also led companies to further mergers to try strengthen their positions. (David Barling at Seed Tribunal, September 2000).

The rejection of GMOs by consumers world-wide is creating tremendous uncertainty and unpredictability for farmers growing GM crops. There is a visible changing trend clearly against genetically modified organisms, and chains of supermarkets worldwide are taking action to eliminate GM products, [Refer article on Brazil's Transgenic -Free Zone published in "Seedling", September, 99].

3,00,000 farmers of the family farm movement in California, United States protested against the National Organic Legislation of USDA for considering genetically modified food, irradiated foods as organic in nature and use of toxic sludge as bio-fertilisers (Dave Henson, October, 2000).

In another instance, consumers in US responded very angrily about mixing of genetically engineered maize in Taco Shell (as told by Debi Barker and Ellen Hickey, October, 2000).

That a growing consumer resistance against genetically engineered foods is gaining intensity is also evident from the instances given below :

- In April 1999, Unilever, Nestle and Cadbury announced that they were phasing out GM products in the face of customer resistance. Tesco and Co-op did the same, joining the other big supermarket chains.
- In August 1999, Edeka, German's largest retailer declared that it is completely abandoning GE. The headquarter in Hamburg announced that

it does sell own-brand products containing GE ingredients. Other large German retailers to go GE free are Spar and Metro.

- In September 1999, Brake Bros., Britain's biggest distributor of frozen foods has eradicated GM ingredients from all its products, making it the first wholesale catering supplier to be totally GM-free. The group promises that all 2,000 food items it supplies to restaurants, hotels, schools and hospitals will be free of GM ingredients.
- Over the last year Holland's biggest retailer Albert Heijin has removed 100 food products that contained GMOs from its shelves.

The trend on acreage under GMOs during 1999 has clearly reversed with a premium being paid for non-GM crops. A recent poll of the *Farm Journal* showed, 22% farmers who has been planting GM crops in the US will reduce their planting of GM this year.

As reported in Business Week, October 18th 1999, page 50, a US farmer, namely Dave Boettger, like many others in his country, is having to pay for having cultivated genetically engineered crops. "ADM is offering 8 cents a bushel more for the old-fashioned corn Boettger grows than for the gene-spliced corn that accounts for one-half of his acreage. But if testing reveals a tiny amount of altered gene anywhere in his grain, he would have to pay ADM for the cost of dumping the entire load."

As reported in Independent, UK, by Paul Waugh on 4th August 1999 the Church of England has refused to allow the Government to use its land to conduct genetically modified crop trials. The decision has been prompted by the growing controversy over the morality and safety of the technology. Tim Cooper, Chairman of Christian Ecology Link, said, "The use of farm-scale trials is premature and dangerous. Research should only be done in a closed environment for the foreseeable future".

In Thailand, the Government has declared Agricultural Zones Free of Genetically Modified Organisms in a bid to promote exports. GMOs have turned into a major concern in several key markets of Thai Agricultural Products including the European Union and Japan.

The State of Rio Grande do Sul, one of the 27 states of Brazil, is known as the "granary" of Brazil, since it is the Brazil's largest seed producer. The state has declared itself a "transgenic free zone" from 1st January 1999. The local government of the State explains this: *to preserve the human health, the environment, the autonomy of the farmers to get seeds, and to increase the sale and production for natural and organic ways, to develop the economy in harmony with the environment (sustainable development).* [refer brochure *Rio Grande do Sul: A place without transgenics*]**.** As explained by the agricultural secretary, Jose Hermeto Hoffman, "We have a very clear objective and Monsanto has a very clear objective, so its like a war."

India too is benefiting from Japanese and South Korean markets for GM-free agricultural products. Speaking to *Business Line,* Mr.B.V.Mehta of Solvent Extractors Association for India, said that the development may provide the much needed shot in the arm for Indian exports. "Almost two-third of our aggregate meal exports are to Asian destinations and the fact that they have grown wary of transgenic foods opens up an opportunity for our country." (refer

News report in *Business Line,* September 13th 1999, *Market emerging for non-GMO foods*)

In Japan, the import of Soybeans has declined rapidly as food processing companies shift their purchases to Soybeans that have not been genetically modified. The Japanese Government has announced plans to require labeling of products made from GM crops beginning in April 2001. In August 99, Kirin, Japan's largest brewer and a leading biotech company, announced that it will stop using genetically modified (GM) corn to make beer by 2001, due to consumer concerns over the safety of bioengineered crops. Although beer is exempt from Japanese requirements for labeling of genetically altered food which take effect in April 2001, Kirin plans to switch to non-GM corn, saying it cannot ignore consumer doubts about the safety of such food.

Japan's third largest beer maker, Sapporo Breweries Ltd., announced that it too will stop using genetically modified (GM) corn to make beer.

Honda Trading Corp, a wholly owned unit of Japanese automaker Honda Motor Co. Ltd., said it will build a plant in Ohio for sorting and bagging soybeans free of genetically modified organisms with an annual handling capacity of 20,000 tonnes of soybeans. Honda Trading will contract with US farmers for production of non-GM soybeans.

Fuji Oil Co. Ltd., Japan's largest maker of soybean protein food products, has decided to stop using genetically modified soybeans by next April.

In March 99, two major grain processors ADM and A.E. Staley Mfg. Co. announced that they would not accept any varieties not approved for import into Europe. Later in the spring, ADM said it would pay a premium for DuPont's STS soybeans, which are not genetically modified.

In the US the American Corn Growers Association (ACGA) in an official press release dated 25th August 1999, has proposed the farmers explore the option of planting non-GMO crops in the light of uncertainty caused by GMOs. The Consolidated Grain and Barge Company in a letter to producers dated 26th August 99, has indicated that consignments containing GMO contamination 'no matter how trivial will not be eligible for premium prices, as GMO crops become increasingly unsaleable on International markets.

Europe's leading dry dog food producer, Royal Cannin, vowed on September 15, 1999 not to include genetically modified (GM) ingredients in any of its pet food lines. The decision by the Paris-based firm comes after British pet food producer Pascoe's Group Plc launched the country's first wholly organic, non-GM dog food line last month. It also comes amid a looming trade war as European consumers, concerned about the safety of foods derived from GM crops, reject genetically modified products many of that are imported from the United States.

India too has voiced its opposition to genetically engineered crops; the Union Agriculture Ministry has opposed a US proposal to bring trade in genetically engineered crops on the WTO agenda [News report dt 26.10.97 in the Observer].

A farmer from USA who portrays a successful fight against genetically modified means of growing cotton. Will Allen's farm is named as Ganesh Farm. Initially starting with a small group of farmers with small land holdings, Will has managed to reach out to many farmers and persuaded them to take up organic means of cultivating cotton, in spite of the numerous odds faced, such as facing the aggressive marketing tactics of corporations and the difficulties in getting bank loans.

In the first week of September 1999 US Agribusiness giant Archer Daniels Midland Co., alerted trading partners against biotechnology asking suppliers to keep Genetically Modified crops separate from conventional ones. In an official statement issued by ADM for distribution to grain elevators and large-scale producers, the company said "we encourage you as our supplier to segregate nongenetically enhanced crops to preserve their identity…. Some of our customers are requesting and making purchases based on the genetically origin of the crops used to manufacture their products. If we are unable to satisfy their requests, they do have alternative sources for their ingredients".

Genetic Manipulation Firms (e.g. Monsanto) are on top of the Ethical Investors' Blacklist. As reported in the *Scotsman* dated August 31, 1999, a survey of socially responsible investors by the Ethical investment Trust shows that concern about investing in business carrying out GM research among firms has gone from being a minor issue two years ago to investors' second biggest concern. The report follows the revelation that (Deutsche Bank) Europe's biggest bank, has advised leading investors to sell their shares in companies involved in the GM foods industry. Guy Hooker, the director of the Ethical Investment Co-operative's Edinburgh branch, said the explosion in awareness about genetically modified organisms (GMOs) and the call to avoid them has been staggering.

The most pertinent example of the growing rejection and eroding market of its products is that of the Terminator Technology. Monsanto had to withdraw its decision to commercialise its Terminator Technology because of worldwide resistance against it. This is the technology that triggers seed-sterility in crops thereby creating a biological lock against seed-saving and replanting. With its reputation to conceal, Monsanto has on various occasions claimed either that the technology does not exist, or that it is not yet in use in its commercialised lines. Today it has had to publicly announce suspension of its Terminator Technology in the light of widespread protests.

There is a complete absence of biosafety regulation on the large-scale spread of GMOs in the US. The United States has failed to sign and ratify the Convention on Biological Diversity and has undermined legally binding international Biosafety Protocol that was being evolved under the Convention. The United States has no regulation domestically to make safety tests mandatory. Monsanto is using the US administration to dismantle regulatory systems in all countries to be able to release its GMOs under totally unregulated conditions. Its functioning in India also indicates that it would like to bypass and dilute existing regulations to ensure reckless and careless commercialisation of GM crops that bring no benefit to Indian farmers but introduce new costs and environmental risks.

6. The Inadequacies of Present Biosafety Regulations

The clearance of Monsanto's trials with toxic plants without the democratic consent of concerned governments, from state to local level and democratic participation of the public in biosafety decisions reveals the loopholes and inadequacies in the present Biosafety regulations both from the democratic perspective and the ecological perspective. The trial produce has been freely marketed without adhering to any containment process.

Polls have shown that more than 80% of the American consumers want genetic engineering foods labeled. The US government and industry argue that labeling is not necessary because genetic engineered foods are "substantially equivalent" to the foods they replace. This argument was fairly discredited by FDA scientists before the regulations governing genetic engineered foods for humans and animals foods were developed in 1989 to 1992.

Ms. Dena Hoff, Chair of Northern Plains Resource Council, USA

Thus in the wake of above events biosafety regulations need to undergo dramatic changes through increasing public participation in decisions related to genetic engineering.

The clearance for trials of genetically engineered crops and their release needs to be given not just by the central government but by all levels of government, from the state to the local level. Further before any clearance is granted for trials of a particular genetically engineered crop the application for trials should be notified to the public as part of the citizen's right to know. Public hearings need to be organised in the specific villages and districts and states where the trials and introductions are planned.

The scientific framework of the ecological impact of genetically engineered crops on biosafety, ecosystem health and public health also needs to be upgraded for dealing with the impact of field trials and deliberate releases under diverse ecological contexts existing in India.

If Monsanto and the Indian government fail to fulfil these ecological and democratic criteria for field trials of genetically engineered crops, we will have further evidence that the promotion of genetic engineering by corporations like Monsanto can only be based on dictatorial, distorted and coercive methods. In such context, genetic engineering in agriculture must necessarily be anti-nature and anti-people.

The Need for Strong Biosafety Regulations

The Monsanto trials with genetically engineered crops have clearly shown that there are many gaps and many weaknesses in the regulation of genetically engineered (G E) crops and there is an urgent need for strengthening the biosafety regulations in India.

The Regulatory Anarchy in Genetic Engineering

The trials have shown that under the present regulations it is possible for a company to perform G E trials secretly without prior informed consent of either the state government or the local community or Gram Sabha. The Agriculture Minister of Karnataka, Shri Byre Gowda, was informed about the trials in his state through the newspapers. The Agriculture Minister of Andhra Pradesh said that the Department of Biotechnology had given the clearance for trials to MAHYCO without informing the state government. The fact that it was MAHYCO which got the clearance but Monsanto which carried the trials out shows how much anarchy exists in approval for G E experiments and commercialisation.

The approval of trials should include prior informed and also prior informed consent of state governments or local communities or Gram Sabhas. The states should be included because agriculture is a state subject. People should be included because decentralised democracy and Panchayati Raj are commitments, which have been made through the Constitution. The present regulations have no respect for the decentralised democracy required by Panchayati Raj. Nor do they have any room for public participation in decisions about genetic

engineering either at the experimental stage or at the commercialisation stage. These lacunae must be filled to ensure democratic participation and decision making.

The anarchy, chaos and confusion in the regulatory system needs to be stopped. This requires that all trials are stopped till Biosafety Regulation is made strong, coherent, scientifically sound and transparent through public participation.

Corporations as "physician, diagnostician and patient - all in one": The Need for Public Monitoring of Private Corporations

The Monsanto trials have also revealed that the corporations pushing genetically engineered crops are simultaneously the judge and the accused.

When Trade Related Intellectual Property Rights (TRIPs) Agreement of WTO was signed, a Monsanto representative had claimed that Monsanto with other corporations had shaped and designed the agreement. As they stated, "We were the physician, the diagnostician, the patient - all in one". In the area of Biosafety too, Monsanto seems to be functioning as the diagnostician, physician and patient - all in one.

They are the source of information on biosafety, they carry out the trials without government and public monitoring and they themselves declare their activities as safe and causing no risks.

The information on risks and status of the GMO are provided to GEAC by the company, not the Government, ensuring that biosafety information is biased, not neutral.

The Andhra Pradesh Government's order to Mahyco-Monsanto to stop trials and to only carry them out in the Research stations of Shri N.G. Ranga Agricultural University under the direct supervision of government scientists is a precedence that should be applied nation wide. Genuine biosafety requires that experiments with GMOs prior to commercialisation be carried out in the public system and not by the private firm that stands to gain through commercialisation and has nothing to lose if there is "genetic pollution" and risks posed to the environment and public health.

The public system science and technology capacity in India is high, and our scientists have better knowledge of plants and ecosystems than Monsanto's scientists or narrowly trained biotechnologists whose expertise is restricted to petridishes and does not cover ecological and ecosystem expertise. Public scientists with ecological expertise will therefore do a much more comprehensive job of assessing the ecological risks of transgenic crops than corporate scientists with biotechnology expertise. This will also ensure better monitoring and control over the trials.

In addition to experiments being carried out in public system institutes, public participation in the monitoring of trials is also essential.

Scientifically Fraudulent Assumptions of "Substantial Equivalence" and the Undermining of Biosafety

The entire genetic engineering guidelines is based on the false assumption that GMOs behave like their naturally occurring counterparts. The guidelines are also based on the totally incorrect assumption that "G E organisms have greater

predictability compared to species evolved by traditional techniques". Neither of these assumptions is true. GMOs do not behave like their naturally occurring counterparts and the behaviour of GMOs is highly unpredictable and unstable.

Naturally occurring *Klepsiella planticola* does not kill plants, but as research at the University of Oregon has shown, the genetically engineered Klepsiella was lethal to crops (Report of the Independent Group, 1996).

The naturally occurring *Bacillus thuringiensis* (Bt) has not contributed to the evolution of resistance in pests, but the genetically engineered Bt. crops create rapid resistance evolution because the Bt. toxin is expressed in *every* cell of the plant, *all* the time (Shiva, 1998). The assumption of "substantial equivalence" does not hold, and the absence of strong biosafety regulation is undermined because of this false assumption of substantial equivalence.

The assumption of "predictability" is also totally false. While genetic engineering makes the *identification* of the gene to be transferred into another organism more predictable, the ecological *behavior* of the transferred gene in the host genome is totally unpredictable. A transgenic yeast engineered for increased rate of fermentation with multiple copies of one of its own genes, which resulted in the accumulation of the metabolite, mythylglyoxal, at toxic mutagenic levels. Intransgenic tobacco, 64 to 92 per cent of the first generation of transgenic plants become unstable. Petunias do not have unstable colouring, but genetically engineered petunias changed their colour unpredictability due to "gene silencing" (Report of Independent Group of Scientific & Legal Experts on Biosafety, 1996).

Monsanto's Round up Ready Cotton engineered to resist Monsanto's herbicide Round up, had its bolls falling off, an instability which does not occur in the naturally occurring cotton and was induced unpredictability due to genetic engineering of herbicide resistance. Monsanto has been sued for millions of dollars because of the losses incurred by farmers.

GMOs do *not* have greater predictability compared to species evolved through traditional techniques. Since the very assumptions underlying our genetic engineering guidelines are false, we need to evolve new Biosafety Regulations on the basis of honest and good science, after assessing all the independent scientific evidence available across the world. Guidelines based on anti-democratic structures and unscientific assumptions provide no safeguards for the public or the environment. Strong biosafety regulation with strong public participation is both a democratic and an ecological imperative. The public and the government needs to act immediately to prevent private corporations from unleashing, irreversible genetic pollution through the release of GE organisms in the agriculture and the environment.

- A ten year moratorium should be introduced on all commercialisation of genetically engineered crops both through imports and through seed production and distribution in India while full and adequate ecological and regulatory frameworks for assessing the ecological impact of genetically engineered crops and public participation is evolved.
- The regulatory framework for genetic engineering is not just inadequate in India. It is inadequate worldwide. In the U.S., trials for such crops do not have any ecological dimensions. They only assess agronomic

performance. The data from the hundreds of U.S. trials is basically "non-data from non-trials" in the ecological context.

- The large scale seed failure pushing farmers to suicides create the need for strict certification and liability for the commercial seed sector. This issue of liability becomes urgent in the context of genetically engineered seeds which in addition to normal risks of seed failure have the potential of leading to genetic pollution and high ecological risks.
- The farmers' seed supply and direct exchange network must be strengthened through community control and local participation. Farmer's seed supply system must be treated totally distinct from the commercial seed supply system. While the commercial private seed supply system needs strong state regulation, farmer seed supply should function free of state interference with strong community control and public participation.

Biotechnology and genetic engineering in agriculture is evolving in a total regulatory vacuum as it is clear from the U.S. situation. Monsanto itself states, "Monsanto should not have to vouchsafe the safety of biotech food,". "Our interest is in selling as much of it as possible. Assuring its safety is the F.D.A's job". FDA does not look at the safety of Bt. crops since such crops are treated as a pesticide. EPA which is supposed to look at safety of pesticides treats genetically engineered crops which produce pesticide as conventional crops and hence does not look at the safety either. There is, therefore, no agency guaranteeing the safety of genetically engineered crops. It is to fill this policy vacuum for environmental safeguards that citizens worldwide are calling for a five year moratorium on genetic engineering in agriculture.

7. Illegal Spread of Bt cotton from Illegal Trials in India

Bt. cotton illegal planting in Gujarat without any clearance from Genetic Engineering Approval Committee (GEAC) once again highlighted the lack of biosafety infrastructure in India. More than 10,000 hectares planted with "Navbharat 151" cotton in Gujarat has been tested by GEAC and found to contain the Bt. gene.

Gujarat is an important cotton-growing region in India. In 2001, in spite of good rainfall and good cotton crop growth, an epidemic of bollworm devastated the cotton crop throughout the state. The pest menace was so acute that even the seed producers were compelled to discontinue their hybrid cottonseed production programmes. The continuous and heavy spraying of pesticides did not save the crop. However, one cotton variety, Navbharat-151 was observed to be completely free from bollworm damage. This variety had been planted over a sizable area across the Gujarat State during current monsoon season, with the company (Navbharat Seeds Pvt. Ltd.) having sold 10,000 packets (each packet contain 450 grams for an acre) during the season.

The Navbharat 151 was suspected by the other private seed companies dealing in cottonseed to be a transgenic product containing the Bt. gene, which provides protection against bollworm. It was also found that the company has been selling Navbharat-151 since last 2-3 years and that many farmers have raised cotton crop using open pollinated (OP) seeds collected from the variety

grown in the previous season. Several seed companies of Gujarat in a joint memorandum to the Department of Biotechnology, Government of India, appealed to take immediate action to stop the cultivation of Navbharat 151 because its OP seeds would spread at a faster rate in a larger area not only in Gujarat State but also other cotton growing regions of the country. According to them, the spread of unauthenticated and illegal seeds carried serious risks and would have grave consequences for Indian farmers and Indian agriculture as a whole, if found to have Bt. gene. The appeal was meant to enforce strict biosafety rules to check the bio-pollution.

Biosafety means minimizing the risks to environment and human health from the handling and transfer of Genetically Modified Organisms (GMOs). The biosafety regulatory framework in India consists of the 1989 Rules issued by the Minister of Environment and Forests under the Environment (Protection) Act, 1986. As per these Rules, Review Committee on Genetic Manipulation (RCGM) established under the Department of Biotechnology oversees only research activities. However, approvals for large-scale releases and commercialization of GMOs are to be given by the Genetic Engineering Approval Committee (GEAC), established under the Ministry of Environment and Forests, Government of India.

Acting on the request of private seed companies and newspaper reports about marketing of transgenic Bt. cotton seeds (Navbharat-151) as conventional hybrid seeds by the Navbharat Seeds Pvt. Ltd. of Ahmedabad, without the mandatory approval of the GEAC, the Ministry immediately sent a notice to the company seeking explanation. The Ministry also procured a packet of the seeds marketed by the company (Label No. 002948 dated 30.3.2001, Lot no. JAN-01-06-OOF-028) and had it tested at the South Campus of the University of Delhi, for the presence of Cry 1A© gene (a patented product of Monsanto Inc. and therefore their intellectual property). The seeds tested positive, indicating that they are genetically engineered. Dr. E. A. Siddiq, Chairman of an Indian Department of Biotechnology Committee, that monitors transgenic crops, said that, "this is a foretaste of a frightening situation where transgenic will be out of control and all over the place", thus highlighting huge loopholes in the regulation regarding seed distribution and safety issues related to transgenic crops.

The Environment Ministry also sent a two-member team comprising of Dr. C.D. Mayee, Director, Central Institute of Cotton Research, Nagpur and Dr. T.V. Ramanaiah of the Department of Biotechnology, New Delhi, for on-the spot inspection of the fields near Ahmedabad. They conducted Gene Check and ELISA tests on the samples collected from these fields. Their observations and the test reports conclusively indicated that the 'Navbharat-151' is transgenic cotton containing Cry 1A© gene. The Navbharat Seeds Company had not obtained any approval for developing this Bt. hybrid. The environmental impact of this transgenic crop has also not been studied and tested. Thus the M/s Navbharat Seeds Pvt. Ltd., violated the provisions of the 1989 Rules notified under the Environment (Protection) Act (EPA), 1986. In accordance with the Rules for Manufacture, Use, Import, Export and storage of hazardous microorganisms/ Genetically Engineered Organisms or Cells, 1989, under the EPA, no person can import, export, transport, manufacture, process, use or sell

any genetically engineered organisms without the approval of Genetic Engineering Approval Committee (GEAC). The Principal Secretary, Forests and Environment, Government of Gujarat informed the GEAC that nearly 11,000 acres in Gujarat is under cultivation of Navbharat-151. Meantime it was brought to the notice of the GEAC that Navbharat Company is engaged in the seed production of Navbharat 151 under the name of *Jay, Vijay* and *Digvijay* in Andhra Pradesh.

The Ministry of Environment & Forests convened a meeting of GEAC on 18th October 2001 and decided to immediate intervention to "prevent damage to the environment, nature or health as a result of the standing crop of Navbharat 151". On the same day GEAC issued an order to uproot the standing crop of "Navbharat 151" and destroy it by burning and also to destroy the seed production plots and seeds harvested. The order also included to 'remove and destroy the breeding lines, hybrids, segregating material including any plucked cotton bolls or any breeding material and seed material available with the company'.

However, this order was later changed (on 31st October 2001) to procure the cotton which has already reached the market, destroy the seeds and store the lint; the Gujarat Government would also procure the cotton from the remaining standing crop of "Navbharat 151" in the farmers' fields and also from farmers' storage places, and that this procured cotton would be ginned for separation of lint and seed, the seeds will be destroyed and separated seeds would be kept under safe custody till further orders from GEAC; that the state government would ensure uprooting and complete destruction of the cop residue by uprooting, burning and sanitation of the fields. The state government of Gujarat was also directed to take necessary steps to prevent the use of Navbharat 151 seeds by the farmers either in the F^1 or F^2 generations.

In addition, the GEAC directed the government of Andhra Pradesh to "take necessary action for stopping immediately the seed production and multiplication programme of the Navbharat 151, or by whatever name it is called, in the Kurnool and Mehboob Nagar districts of Andhra Pradesh as has been confirmed by the reports".

Navbharat Seeds Pvt. Ltd. challenged the GEAC Order of 18th October 2001 in the Delhi High Court on 24th October 2001 in the case *Navbharat Seeds Pvt. Ltd. Vs Union of India & others*.

The company has basically argued that it has engaged in conventional crop breeding research since 1983. That the Navbharat-151 cotton variety is an *intra hirsutum* hybrid and it was developed by using conventional plant breeding method and has not carried out genetic engineering methods to produce seeds; that it is a very small company and has no such facility of genetic engineering research; and that it has basically produced a hybrid from cotton plants collected from Maharashtra, selected superior hybrids and then registered the hybrid "Navbharat 151" with the Department of Agriculture, Government of Gujarat, and marketed it for the last two years. In the year 1999-2000, 1371 kilograms of "Navbharat 151" seeds were produced while in 2000-2001 it was 5817.50 kgs. In the year 2000, the 2437 packets of "Navbharat 151" were sold while in the year 2001, 11820 packets of "Navbharat 151" were sold.

It is thus evident that the source of the Bt. in the "Navbharat 151" hybrid has come from either the open field trials undertaken by Monsanto-MAHYCO or by cross-pollination from their trials with other cotton varieties. In either case Monsanto and MAHYCO are the source of the genetic pollution that has now entered the commercial seed supply through hybridization, either intentionally or through natural processes. Incidentally, Dr. D. B. Desai, the Managing Director of the Navbharat Company is a former employee of MAHYCO.

Bt trials: illegal seed production under the guise of research

The large-scale illegal commercialization of Bt. cotton in Gujarat is therefore clearly linked to Monsanto-MAHYCO trials.

On 10th March 1995, MAHYCO, a collaborator with Monsanto, imported 100 grams of the Bt. cottonseed after obtaining permission from Review Committee of Genetic Manipulation (RCGM) under the Department of Biotechnology, and not from the GEAC, which, under the Environment (Protection) Act 1986, is the only body that can grant permission for importing genetically engineered substances (seeds in the present case). Therefore the import of Bt. gene into India was illegal.

In 1998 the large scale, multicentric, open field trials by Monsanto-MAHYCO began in 40 acres at 40 locations spread over nine states. These field trials were also started without the permission from GEAC even though it is the sole agency to grant permission for large-scale open field trials of GMO's under the 1989 Rules.

While genetically engineering trials are supposed to involve the destruction by burning of all vegetative parts and leftover seeds, the Bt. cotton trials of Monsanto-MAHYCO have systematically multiplied seeds.

The companies did not ensure post harvest management and safety. Many of the farmers who had participated in the trials sold their genetically engineered cotton in the open markets. In addition, some of the farmers replanted their trial fields with crops like wheat, turmeric, groundnut etc., in total violation of Para-9 on "Post harvest handling of the transgenic plants" of the Biosafety Guidelines, 1994.

The isolation distance maintained were insufficient. Trials there were several fields of conventional cotton at a distance of 10-15 meters from Bt crops at trials sites and this short distance can lead to genetic contamination of the neighbouring cotton crops. However there is no coherence among the monitoring agencies on the maximum distance to which Bt. pollen can fly. According to DBT, the gene flow in Bt cotton is two metres while MAHYCO-Monsanto says that it is 15 metres. However US Department of Agriculture says that it is three miles.

Moreover, no measures for containment to prevent grazing of animals or picking by others were followed.

Again, the planting with Bt seed in the trials was delayed; delayed planting of any cotton reduces the risk of bollworm attacks, and thus the efficacy of Bt is yet to be proven.

The illegal trials carried out for the past five years by Monsanto-MAHYCO thus became an underhand means for seed multiplication and it is this illegally

multiplied seed that has now spread to large areas in Gujarat. It was this kind of violation of laws and Rules, as well as the risks of genetic pollution that forced Research Foundation for Science, Technology and Ecology (RFSTE) in 1999 to take Monsanto and MAHYCO to court. Monsanto Bt. cotton has not yet been cleared for biosafety and commercial release in India.

Ironically, in spite of the fact that a Supreme Court case challenging the 1998 field trials is ongoing and that there were numerous irregularities and violations of biosafety laws and guidelines in previous year field trials, the hitherto-ignored GEAC has not merely given Monsanto-MAHYCO permission in July 2000 to undertake large scale field trials of Bt. cotton in 85 hectares, but also permission to produce seed production in 150 hectares, making it very clear that the motive is commercialization rather than actual research or biosafety concerns.

Interestingly, the GEAC was not satisfied with the results of the trials and it withheld environmental clearance for large-scale cultivation of transgenic Bt. cotton. Instead, it called for fresh large-scale field trials under the direct supervision of the Indian Council of Agricultural Research under their Advanced Varietal Trials of the All India Co-ordinated Cotton Improvement Project. GEAC also sought comprehensive data from the field trials that would be conducted in multi-locations under different agro-climatic conditions.

Even in its submission in the Gujarat case, the GEAC has admitted that Bt. cotton poses major risks. It says:

(i) The crop, which is standing, may pass to the soil that modified genes which it contains. The effect on soil microorganisms can not be estimated and may cause an irreversible change in the environment structure of the soil. It is a standard practice to uproot crops which pose such a threat. The destruction by burning is to ensure safety to environment and human health and to obviate any possibility of cross-pollination.

(ii) The destruction of the cotton produce as well as seeds harvested from this plant is also equally necessary. The cotton which has been produced is genetically modified cotton, the effect of which i.e. allergenicity and other factors on mammals are not tested. The precautionary principles would require that no product, the effect of which is unknown be put into the market stream. This cotton which in appearance is no different from any other cotton will intermingle with ordinary cotton and it will become impossible to contain its adverse affect. The only remedy is to destroy the cotton as well as the seeds produced and harvested in this manner.

(iii) Since the farmers are being put to a loss, the further process to determine the compensation payable to farmers, who have unwittingly used this product has to be determined and undertaken.

13. I would respectfully submit that every day of delay in this matter poses a threat to the environment."

This submission clearly points out the enormity of the environmental damage that had been done by the illegal planting of transgenic cotton. It also indicates the practical difficulty of containing this damage, which is impossible to reverse. Even if the sale of the Bt cotton is banned in future years, it will

continue to be cultivated in fields as many farmers have saved the GE cotton F^1 seeds for planting in coming years. Even this year many farmers used F^1 and F^2 seeds of the Navbharat 151 in Gujarat. It is believed that the Open Pollinated (OP) seeds would spread at a faster rate in a larger area not only in Gujarat but also other cotton growing regions of the country, especially because of the high cost of branded seeds which poor Indian farmers cannot afford. This, in fact, was the primary motivation behind farmers paying three times the current rate for cotton to buy Navbharat 151 Produce so that they would use its F^1 seeds for next season. Many farmers and local dealers have also reserved the cotton fields planted with Navbharat 151 and even its second-generation OP crops to collect seed for sale in the ensuing season.

The impact of GE cotton goes much beyond the immediate environment to potentially affect human and animal health because in several Indian states, where trials were undertaken, cottonseed oil is the primary edible oil and the seed cake is used for animal feed.

Transgenic Bt. crops: the biological trap for farmers

In Gujarat this year, some farmers got good yield from Bt. cotton, and also did not spend too much on chemical pesticides. However, this is primarily because Bt. is not Commercialized in the country; and hence resistance to it has yet to build up. Experience with Bt. crops from around the world shows a quick buildup of resistance, which has become a main concern in the US and Canada, and has now been detected even in China. Farmers have to spray pesticide to control third and fourth generation of American bollworm insects. In Australia too, farmers have now been advised to go in for more sprays because of a drop in expression levels. With the insect increasingly developing immunity against the Bt toxin in the plant, GE seed companies are now suggesting farmers to adopt refuge method that is now reported to be fifty percent of the transgenic field.

Moreover, Bt cotton is designed to be resistant only to cotton bollworm (*Helicoverpa armigera*) while the cotton crop in India is faced with a complexity of pest attacks. Pests such as whitefly and Pink bollworm have emerged as major pests in the last few years with crop losses being as high as those caused by the bollworm. According to N.P Agnihotri, cotton bollworm led to a 50-60 percent loss in cotton crop, while the whitefly showed an equally significant share of crop losses, in the range of 53-80 percent. (*Pesticide Safety Evaluation and Monitoring*, Indian Agricultural Institute, New Delhi, 1999, p. 10.)

Consequences such as these can severely threaten to jeopardise other ecologically sound methods of pest control and eventually prove devastating to the farmers. Farmers have been forced to apply all kinds of pesticide cocktails to control pest infestation. As seen in Andhra Pradesh, when these costly chemicals fail, thousands of farmers are forced to commit suicides.

Genetically Engineered Bt. is more like a biological trap, more potent than the toxin it produces that kills the American bollworm. The 'chemical treadmill' is now being replaced with a more dangerous 'biological treadmill'.

In India, Monsanto's Bt. cotton is the only cotton variety which has Bt. gene in it. Monsanto, in fact, has the patent on the Bt. gene. Strangely this biotech giant, which has been suing farmers, whose fields were contaminated by the

gene through processes of nature, for theft, has not yet raised any voice against the infringement of their patent by Navbharat Company. This clearly indicates the possibility that the whole episode of Bt. cotton in Gujarat is a calculated move to hasten the commercialization of transgenic crops in the country, especially those with Bt. genes in them.

The Bt cotton has not yet been procured by the Gujarat government from the farmers citing funds constraint. It is in these circumstances that no further trials of GE crops should be allowed in India till the time comprehensive and foolproof biosafety regulations is put in place which ensures that there is now genetic pollution of any kind and further that if any such genetic pollution occurs the biosafety infrastructure is in place to effectively contain it.

The Bt. cotton case in India reaffirms RFSTE's stand of safety first - commercial release of Bt. cotton or any other genetically engineered organisms should be frozen till biosafety structure are put in place and capacity is built at the multiple level of governments as well as farmers to deal with biosafety issues.

Almost all the national farmer unions in India supported this stand and also issued a resolution in this effect. In a resolution adopted on 1st November 2001, the major farmer organisations in India i.e. Akhil Bharatiya Kisan Sabha (Ashoka Road), All India Kisan Sabha (Ajay Bhawan), Bhartiya Krishak Samaj, Bharatiya Kisan Sangh, All India Agriculture Workers Union, Agragami Kisan Sabha, Bhartiya Khet Mazdoor Union, Bhartiya Kisan Union (Ambavat), Samyukta Kisan Sabha and Navdanya declared:

> The Government of India and respective State Governments should buy and destroy the cotton and cotton seeds suspected to be genetically engineered Bt. seed especially in Gujarat and other states.
>
> The Government should compel Monsanto to pay full compensation to the affected farmers since the Monsanto owns the Bt. gene which has spread because of Monsanto's illegal trials and illegal seed multiplication. They are therefore fully liable for the damage caused to Gujarat farmers.
>
> The illegal spread of Bt. cotton reflects the Government failure to regulate and ensure biosafety. The agencies and officials of various Ministries involved should be held accountable for the lapses that have occurred.
>
> In any litigation involving MNC's and farmers and agriculture labourers, the Government must bear the expenses incurred by them in fighting cases to their conclusion in the defense of rights of agriculture workers and farmers rights.
>
> We have resolved that both the Government of India and the Multinational Company, Monsanto, be held responsible for illegally testing Bt. cotton seed and not preventing its illegal dissemination.
>
> We are unanimous in declaring that we are not opposed to scientific advance in agriculture but are totally opposed to the manner in which profit-oriented organisations are allowed to deal with safety provisions in an irresponsible and unchecked manner, greatly increasing the danger to the lives and livelihood of the vast majority of the Indian people.

The illegal spread of genetically engineered seeds in Gujarat also highlights the failure on the government to check the operation of seed companies in India. Since the seed sector was liberalized and MNC's were allowed entry into Indian agriculture as a result of World Bank and WTO driven globalization policies, seed corporations are playing havoc with seed supply and threatening farmers' ecological and economic security.

Already, freedom of seed corporations to make false promises and sell high cost, untested and uncertified seeds under the label of "truthful seeds" has led to large-scale seed and crop failure, pushing thousands of farmers into debt and suicides. Gujarat is the latest example of corporate irresponsibility and the violation of farmers' rights to safe seeds and freedom from risks. The government therefore needs to regulate the seed industry, put all new seeds through two years of coordinated trials, and certify and label seeds according to the method of production and recommendation for appropriate agro-climatic regions.

This corporate crime is a crime against Indian farmers and a threat to India's biodiversity, which provides the ecological and economic security to Indian agriculture.

Failure of BT Cotton in Nimad (Madhya Pradesh) and Vidarbha (Maharashtra)

Cotton, a crop of prosperity, having a profound influence on men and matter is also an industrial commodity of world wide importance. Cotton cultivation in India encompasses total diversity in vastness, spread, agro climate, farming methods, cropping system, planting and marketing, seasons, varieties, duration, yield, quality, costs and returns. Besides being a money spinner, it is also an employment generator as its cultivation provides 200 man-days/ha of employment to about 60 million people through its cultivation or trade and processing.

Although cotton acreage forms only five percent of India's total cropped area, over half the chemical pesticides on agriculture, is consumed by this crop. Controlling bolloworm infestation in cotton with pesticide costs Indian farmers Rs. 1100 annually. With pesticide resistance increasing and becoming wide spread, chemical sprays do not always succeed in protecting the crop.

Cotton, once was considered 'White Gold'. However, inrecent years costs of cultivation of cotton have increased so dramatically that in some villages, the debt accumulated over the last two to three years force women to mortgage their mangalsutra or land-owning farmers to sell an acre or two to start repaying their debt. The entire support system of this increasingly commercial agriculture made up of input dealers, money lenders and commission agents. More readily than men, women, farmers express distress at watching the very land used to produce a variety of dry land crops a mix of food and cash crops (such as Jawar, red gram, green gram, wheat) become useless in providing direct food for the family.

Today nine countries have commercialized genetically engineered (GE) cotton, and a few more are experimenting with the technology. A number of crops have been transformed, but soyabean, maize, cotton and canola occupy about 99% of the total GE area.

As shown in Table 3.10 GE cotton is commercially planted in Argentina, Australia, China, Colombia, India, Indonesia, Mexico, South Africa and the US. More hybrids were approved in India for planting in 2004-05. In India, the Bt gene (Cry 1 Ac-Bollgard) has been introduced only through commercial cotton hybrids, and the three Bt hybrids were planted on 101, 174 hectares in 2003/04.

Bt Cotton in its Bollgard brand name was sold at Rs. 1600/- per packet, which consists of 450 grams of Bt and 120 grams of non-Bt seed of the same variety. The other popular non-Bt hybrids cost around Rs. 400/- to 450/-. The state-wise distribution of the cultivation of Bt Cotton in its first year of commercial cultivation is given in Table 3.11.

TABLE 3.10
Transgenic Cotton Area (2003/04)

Country	***Percent Area***
Argentina	5 - 7%
Australia	30%
China (Mainland)	58%
India	1%
Indonesia	<1%
Mexico	62%
South Africa	70 - 75%
USA	77%

(Ahuja, 2006)

TABLE 3.11
Commercial cultivation of Bt cotton hybrids in India, 2002 (hectares):

State	***MECH-12***	***MECH-162***	***MECH-184***	***Total***
Maharashtra	112	9,300	5,334	14,746
Madya Pradesh	60	404	1,756	2,220
Karnataka	—	3,828	80	3,908
Andhra Pradesh	44	5,564	—-	5,608
Gujarat	76	4,136	4,642	8,854
Tamil Nadu	—-	2,042	660	2,702
Total	**292**	**25,274**	**12,472**	**38,038**

(C.S.A. 2005)

As can be seen, MECH 162 was grown in the largest extent in this year, and almost all of Andhra Pradesh and Karnataka went in for this hybrid amongst the three approved varieties. The largest extent of approved Bt Cotton grown in its first year of commercialization was in Maharashtra, followed by Gujarat.

The table 3.12 shows the state-wise breakup of Bt Cotton seed sales (packets sold, with one packet equivalent to one acre of land) in 2003 and 2004:

TABLE 3.12

State	***Kharif 2003***	***Kharif 2004***
Andhra Pradesh	13500	190000
Gujarat	103000	320000
Karnataka	7500	45000
Madhya Pradesh	33000	207000
Maharashtra	54000	525000
Tamil Nadu	19000	13000
Total	**230000**	**1300000**

CSA 2005, "The Story of Bt Cotton in Andhra Pradesh, Erratic Processes and Results, Feb. 2005, Centre for Sustainable Agriculture, Secundrabad, A.P.

Ahuja, S.L. 2006, "Transgenic Cotton" Science Reporter, Vol. 43, No. 1, January 2006, C.S.I.R., New Delhi.

The total acreage of Bt Cotton increased by around 6 times from the previous year. This included four varieties including a very popular local hybrid from Raasi (which is a popular variety in the states of Andhra Pradesh and Karnataka). The Bt Cotton area is still a negligible part – 5.7% - of the total cotton acreage of 22.5 million (or 225 lakh) acres in the country. These seed sales are alone worth Rs 208 crores of rupees for the companies involved.

According to Table 3.13 in India 58 percent of pesticides are consumed in 5 percent of area under cultivation of cotton. The intensive use of toxic insecticides in cotton has caused serious health and environmental impacts, on farmers and farm workers.

TABLE 3.13
The Crop-wise Consumption of Pesticides in India

Crop	*Pesticide Share - %*	*Cropped Area - %*
Cotton	52-59	5
Rice/Paddy	17-18	24
Vegetables and Fruits	13-14	3
Plantation Crops	7-8	3
Cereals/Oilseeds/Pulses	6-7	58
Sugarcane	2-3	2

Areas Visited : To find the yield of Bt Cotton, a study by RFSTE was conducted in two main cotton growing regions in Madhya Pradesh and Maharashtra. In Madhya Pradesh, cotton is grown in Nimad region consisting of Khandwa, Khargone, Burhanpur, Badwani and Dhar

Though it is the common notion that cotton is grown in Malwa region consisting of Indore, Ratlam, Ujjain, Dewas. Infact very little cotton is grown there.

(i) Nimad Region : Following districts were studied, covering about 33 villages and 110 farmers (Appendix-I)

1. Khandwa
2. Khargone
3. Badwani
4. Dhar

Vidharbha Region : In Maharashtra cotton is grown in Vidharbha region comprising of Nagpur, Bhandara, Washim, Yavatmal, Amaravati, Wardha and Chandurpur. In Vidharbha following districts were visited covering about 22 villages and 116 farmers (Appendix – II) :

1. Yavatmal
2. Amaravati
3. Wardha
4. Nagpur

Varities of Bt Cotton Cultivated: Following are the main varieties of Bt Cotton grown in Nimad and Vidharbha.

1. Mahyco / Monsanto
   a) MECH-12
   b) MECh-184
   c) MECH-162
   d) MRC-6301
2. Rasi
   a) RCH-2
   b) RCH-138
   c) RCH-118
3. Ankur
   a) 09
   b) 651
4. Bunny
5. Nujivedu
6. Proagro

Characteristics of Mahyco / Monsanto Bt Cotton : There is some difference in the Characterizes of MECH-12, MECH-162 and MECH-164 as shown in Table 3.14

TABLE 3.14

Type of Bt Cotton Characteristic	***Bollgard MECH-12***	***Bollgard MECH-162***	***Bollgard MECH-184***
1. Leaf Shape	Semi-okra	Normal	Semi-okra
2. Leaf Texture	Smooth	Slight Hairy	Hairy
3. Boll Size	Big	Medium	Big
4. Maturity (Days)	150 – 160 Medium early	160 – 170 Medium	160 – 17 Medium
5. Suitability	Normal and early sowing	Normal and early sowing	Early sowing
6. Fibre quality	Superior	Medium	Superior
7. Staple length (mm)	28 – 29	26 – 17	28 – 29
8. Recommended for	All soil types, rain – fed and irrigated	All soil types, rain – fed and irrigated	Light soil irrigated

Though Mahyco claims that Bt Cotton does not require any spray for bollworms, however, in its publicity campaign the company advises that Bt Cotton may require supplemental sprays to control boll worms, in case Economic Threshold Level (ETL) is reached.

Scouting method to find out ETL

i) Scouting should be followed twice a week in the morning

ii) In one acre area, select at least 20 plants at random (excluding border rows)

iii) Count the number of live bollworm larva on each of the above selected plants.

iv) If the total number of larva exceeds the total number of plants, then there is need for spray.

Commonly Used Pesticides for Cotton

1.	Thyrodron	6.	Assitop	11.	Syphermithane
2.	Confidor	7.	Metacid	12.	Avaunt
3.	Pride	8.	Ecalux	13.	Trump
4.	Monocrotophos	9.	Endosulphan	14.	Novacron
5.	Roger	10.	Pherwani	15.	Tata Mida

Main Observations of the Study :

(i) In the season of 2005, the rainfall has been adequate and the incidence of bollworms is not that much as it used to be in last few years.

(ii) This year, Bt cotton is severely affected by leaf curl and reddening and wilting of leaf. The problem was diagonosed as a physiological disoder. Scientis have found that Bt cotton is more susceptible than Non-Bt cotton.

(iii) In many cases, the seeds did not germinate properly.

(iv) Monsanto and other seed companies are involved in the false propoganda and presenting the exaggerated claims about the yield of Bt cotton. The dealers and the representatives of the companies told them at the time of purchasing seed that Bt cotton need not be sprayed with pesticides and it yields around 15-18 quintals/acre.

(v) Contrary to the claims of the seed companies (mainly Mahyco / Monsanto) in about 80 percent of cases either the yield is around 3 quintal per acre or the crop –failed. The failure is much higher in Vidharbha.

(vi) Less than 50% of the farmers are aware of refugia and had sown few rows of non-Bt cotton. No farmer is having knowledge about the reason behind sowing the non-Bt cotton seeds around Bt cotton fields. This brings into serious question of pest resistance management plans and their implementation.

(vii) The overall growth of Bt Crop was stunted with limited vegetative growth and plants did not grow above 3 feet height.

(viii) Bt cotton has also caused allergic reaction and other ailments in some of the people. Reddened eyes, itching, sneezing and breathlessness was reported among those who were involved in picking and lifting Bt cotton.

(ix) Due to the Bt cotton failure in Vidharbha more than 446 farmers are reported to have committed suicide during June 2005 and third week of April 2006. These are official statistics, actual number may be higher. Even women are committing suicides, there are 5 such cases. There is no reported case of suicide of farmers in Nimad region of Madhya Pradesh.

(x) Cost of cultivation of Bt cotton in Vidharbha is much higher than that of Nimad region.

(xi) It is a matter of grave concern that the findings of RFSTE are in stark contrast to the hype built around Bt cotton by the seed companies. The study by RFSTE debunks Monsanto / Mahyco claims that Bt cotton returns the socio-economic benefits to the small farmer by reducing the cost of cultivation, cutting down usage of pesticides and improving yields.

Bt Cotton and Allergic Reaction

Apart from poor yield and crop failure, Bt cotton is reported to have caused allergic reaction and other ailments among the people (National Herald 2005 and APMC 2005). The disturbing facts surfaced at a public hearing organized by Agriculture Produce Marketing Committee, Dhar in Madhya Pradesh. Those picking, lifting and even touching the cotton were suffering from allergy. Victims' skin turned red, and swelling occurred, eyes reddened and breathlessness was experienced. Some victims suffered a burning sensation in the eyes, watering, itching, swelling of eyelashes, sneezing and running noses. Table 3.15 gives the list of victims who suffered symptoms with in about five hours of touching the cotton. The persons who covered their body parts remained unaffected.

Continued exposure led to a worsening situation. Some labourers lost wage-days. This had never happened before. Purwa Bai of Khaparkheda was hospitalized to severe rash and swelling on the face and arms. Another farmer stored the cotton in his house and was similarly affected when he sat near it.

It is not difficult to understand why Bt cotton causes allergic reactions and other ailments among humans. A poisonous gene has been introduced in Bt cotton which kills the pests. The poisonous gene may also affect human health. Monsanto, the company that mainly produces genetically modified seeds was permitted to sell Bt seeds under the non-edible crop but oil extracted from the cotton is refined and is also used for cooking. The oil-cake too is used as cattle feed. There is a need to make comprehensive study about the deleterious impact of Bt cotton on humans and animals.

A team consisting of Dr Ashok Gupta of Peoples Health Movement and other activists conducted a survey. The team interviewed 23 of the farm and factory workers who fell ill after having handled Bt cotton. All had itching skin, 20 had eruptions on the body, and 13 had swollen faces. In some case, the itching was so bad that they had to discontinue work, or take anti-allergy medicine in order to be able to work. The survey resulted in a report which concluded "All the evidence gathered during the investigation shows that Bt has been causing skin, upper respiratory tract and eye allergy among persons exposed to cotton".

National Herald 2005, "Bt Cotton Causing Allergic Reaction in MP," 7 December, 2005, New Delhi.

APMC 2005, "Agriculture Produce Marketing Committee, Kuchhi, Dhar (M.P.). Dried Crops, Saddened Faces."

Another report has also found similar evidence. The allergy is not restricted to farm labourers involved in picking cotton but has affected labourers involved in loading and unloading Bt from villages to market, those involved in its weighing, labourers working in ginning factories, people who carried out other operations in the field of Bt cotton, or farmers who stored cotton in their homes. (Santhanam 2006)

The skin was the most common site of allergy: itching, redness, eruptions and swelling. Typically, after the first 4-5 hours of exposure, most people complained of itching on the face and the hand. Soon, the itching increased and by the time they finish the day's work, they had redness on the hands and face and swelling of the face. After continued exposure of one to two days, small white eruptions would appear, most often on the face. The symptoms began to subside after varying periods from four to five days up to five to six months, but black discolouration would show on the skin. The people affected did not have previous history of allergies even though they were involved in picking cotton earlier.

Those who had more severe symptoms of the skin tend also to have associated allergies of eyes and respiratory tract. Eye irritation, involving itching, redness, swelling and watery eyes affected 11 of the 23 individuals; 9 had upper respiratory symptoms of watering from the nose and excessive sneezing. Three had mild symptoms, while 10 each had severe and moderate symptoms respectively. One woman had to be removed from the fields and taken to Barwani District Hospital where she remained for 9 days.

Cotton fibre appeared to be causing the allergy. (In the case of the Bt maize in the Philippines, the pollen was suspected to be the main culprit.) The owner of the ginning factory Mr. Sunil Patidar said that symptoms like itching, redness of eyes, watering of eyes and cough were found in labourers in his factory. Most of the labourers were having problems, and the year before, it was even more prevalent. He said that was why labourers were not ready to unload the cotton-loaded truck from Maharashtra.

The labourers working in different ginning factories said itching of the whole body was very common, and only when they took Tab. Avil (a common anti-allergy medicine) every day were they able to work.

Kalibai of Kothra said she has been working for 20 years picking cotton and never had any symptoms until 2004, when she suffered very bad allergy from picking Bt cotton. Dr. Ramesh Jar of Saigaon, an Ayurvedic doctor, has been practicing in Aawli, Tal Thikri in District Barwani. He said he has already received around 150 cases of allergy from two villages of Aawli and Saigaon in 2005. In 2004, he had around 100 cases. He is prescribing Dexona injection and Levocetrigen for skin and anti allergic drops for eyes. Dr. Debashish Baner, an agriculture scientist, thinks that Bt cotton produces Bt toxin in all tissues including cotton fibres.

Santhanam, R. 2006, "More Illness Linked to Bt Crops", san@i-sis.org.uk.

TABLE 3.15

Details of Allergic Reaction Due to Contact With Bt Cotton

Name of the victims	*Village*	*Tehsil*	*District*
Narender Poonam Chand	Khaparkheda	Kuchchhi	Dhar
Jyoti Khemender	Bajrikheda	Kuchchhi	Dhar
Dev Kuwar Bai	Khaparkheda	Kuchchhi	Dhar
Sevakram Laxmi	Khaparkheda	Kuchchhi	Dhar
Purwa Bai	Khaparkheda	Kuchchhi	Dhar
Devram	Khaparkheda	Kuchchhi	Dhar
Bachchi Bai	Kotra	Manawar	Dhar
Madhubala Mansaram	Kotra	Manawar	Dhar
Babita Mukesh	Kotra	Manawar	Dhar
Kali Bai	Kotra	Manawar	Dhar
Anu Mantiya	Kotra	Manawar	Dhar
Suka Bai	Kotra	Manawar	Dhar
Deepak Sobharam	Kotra	Manawar	Dhar
Kishore	Kadmal	Kuchchhi	Dhar
Kamal	Kadmal	Kuchchhi	Dhar
Kasari Tatiya	Bajrikheda	Kuchchhi	Dhar
Yashoda Bai	Avali	Tikri	Badwani
Babu Bhalu	Bagood	Tikri	Badwani
Dudalal Sitaram	Bagood	Tikri	Badwani
Durga Lal Jaat	Bagood	Tikri	Badwani
Mangilal Ramesh	Avali	Tikri	Badwani
Chander Bai	Avali	Tikri	Badwani
Rekha Kishore	Avali	Tikri	Badwani

(APMC 2005)

TABLE 3.16

Detail of Dried Up Bt Cotton in Talwada Village in Dhar

Farmer's Name	*Variety of Bt Cotton*	*Area (acres)*	*Sowing Date*	*percentage of Dried up Plants on 17.10.05*
Rajesh s/o Gangaram Kulmi	MECH-184	5	29.5.05	95
Bhagwan s/o Karuna Kulmi	MRC-6301	6	20.5.05	90
Madhusudan s/o Sankar Kulmi	MRC-6301	3.5	27.6.05	80
Shantilal s/o Krishna	OM-3	2	28.6.05	90
Kailash s/o Gisaji Sirvi	MECH-184	2	28.6.05	95

(APMC 2005)

False Propaganda by Monsanto and Other Seed Companies

The Public hearing conducted by Agricultural Produce Marketing Committee Kuchchhi, Dhar in M.P. also confirms the findings of Navadanya / RFSTE. As shown in the Table 3.16 in village Talwada in Dhar district, in many cases about 90-95% Bt cotton plants were dried on 17, October 2005. The Bt cotton was sown between 20th May and 28th June, 2005. According to the farmers non-Bt cotton plants did not dry up. Table 3.17 shows the qualitative difference between Bt cotton and non-Bt cotton.

Monsanto is involved in the false propaganda and presenting the exaggerated claims about the yield of Bt Cotton, 15-20, quintal per acre. The photograph of one Radhey Shyam has been shown on the poster of Monsanto. The poster claims that Radhey Shyam got 20 quintal per packet/per acre. However, the investigation reveals that Radhey Shyam got 20 quintal in 5 packets / 5 acres, which means that the actual yield is not more than 4 quintal per acre. For Monsanto, this is a normal way to advertise its seeds; there is nothing unethical.

The company pamphlet cleverly in very small print says "Crop management is beyond our control, for the crop yields farmers are entirely responsible." It is obvious that in the case of failure of seeds, company wants to absolve itself from any responsibility. But the claims in bold and big letters totally contradicts what is written in small print. The farmers want to know why the Bt cotton brands are marketed as bringing higher yield.

A number of allegations were made at the public hearing. Narendra Pawar from Khaparkheda recalls: "The seed company representatives would say anything to avoid responsibility. When we said the crops are dry, they said you needed more water. If we said the field was irrigated, they would say there was too much water. If we sowed in May, they said it was too early. Those

TABLE 3.17

Qualitative Difference in Bt and non-Bt crops

Characteristic	***Bt cotton***	***Conventional hybrid***
Flowering	15-20 days earlier	15-20 days later
Plant height	90-110cm	115-130cm
Boll size	Smaller	Larger
Number of bolls/plant	40-45 more	40-45 less
Premature drying and shedding of bolls	More	Less
Tolerance to aplitic stress	Poor	Moderate
Staple length	Short	Long
Number seeds/boll	30-35	16-20
Pest incidence – Bollworm	71%	81%
Pest incidence – sucking pests	29%	19%
Number of pickings	Less	More

(CSA 2005)

who waited until July were told it was too late. They tried to say it was a fungus, but we split open the plants and there was no symptom of wilting owing to fungal infection. Then they began to say that we never gave any guarantees for high yields." (Zaidi 2006)

Private seed companies have been given a free hand in the name of research. There are no regulations and no scrutiny. Agricultural university puts out no more than 3-4 varieties in 10 years. Then how do these companies bring twenty varieties to the market in the same period. Where are they doing their testing?

Therefore, it should not come as a surprise that upto 75% of the Bt cotton seeds in parts of Salem and Namakal districts of Tamil Nadu failed to germinate. According to the Monitoring and Evaluation Committee (MEC) comprising 20 civil society groups, the situation is no better in Andhra Pradesh where failure of Bt cotton hybrids of Naziveedu seeds began with their failure to germinate. A large number of farmers ended up purchasing two packets of Bt Cotton per acre to address the problem, involving an expense of nearly Rs. 3500 on seed alone. And even after this they have not obtained full germination. (Parsai 2005)

The companies seem to have laughed their way to the bank, capitalizing on the farmers misery. Where a farmer would have settled for one packet of seeds, he was forced to purchase two. Instead of the liability being fixed, the problem is actually a bonus for the companies, while it was blamed on excessive rain.

Visits to the fields and discussion with the farmers by MEC, especially the ones who have sown Bt and Non-Bt varieties show that under the same condition – weather and soil – while Bt cotton seeds failed to germinate, the Non-Bt cotton varieties reported 100% germination. The Non-Bt varieties such as LRA were available at Rs 70 Kg. with the seed rate being around two kg on one acre, where as Bt cotton seeds on an average cost Rs 1725 per packet of 450 gms.

In Madhya Pradesh, Bt cotton crops in over two lakh acre in Nimar region suffered partial or complete wilting. But again, the seed companies particularly Monsanto are not even remotely concerned. The seed business is certainly lucrative and tension free. Aided and abetted by a supportive Ministry of Agriculture, the thrust of the seed trade appears to be on how to draw out money from the village hinterland. As the village economy dips, farmer's indebtedness grows, resulting an alarming increase in suicides.

Whether it is hybrids or the high yielding varieties of crops, whether it is cross-breeding of cattle or more recently, the introduction of the genetically modified seeds, the fact remains that those who provide the technology are not held responsible, if the technology they sell to the farmers fails to deliver. Nor are they held accountable, if the technology turns into polluting.

Monsanto Guilty of Monopolistic Practices

According to Director General Investigation and Registrations (DGI&R), the investigative arm of Monopolies & Restrictive Trade Practices Commission

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Zaidi, Annie 2006, "Failure in Nimar" Frontline, 27 January, 2006, Chennai.

Parsai, Gargi 2005, "75 percent of Bt Cotton Seeds Fail to Germinate", 10 Nov., 2005, Hindu, New Delhi.

(MRTPC), Mahyco-Monsanto has failed to explain the rationale for the high fee. (Bhan 2006)

The DGI&R has held Mahyco-Monsanto Bio-Tech (India) guilty of monopolistic trade practices on account of charging an exorbitant trait fee – Rs 1,250 for every 450 gm packet – for Bollgard Technology (Bt) cotton seed in India.

"The benefits accruing to the farmers cannot be the basis for fixing the trait fee per packet. The reason for charging such an exorbitant trait fee appears to be the monopolistic position enjoyed by the Monsanto cotton seeds," according to a report submitted by DGI&R.

The MRTPC had on October 20 in 2005 directed DGI&R to investigate the allegations of unfair trade practices under Section 29 (o) of the MRTP Act, 1969, against Mahyco-Monsanto, a 50:50 joint venture between Indian company Mahyco and multinational Monsanto.

While claiming that it had been incurring an expenditure of more than $500 million (Rs. 2,200 crore) every year on research and development over the past three years, the company had argued that there was neither distortion of competition nor any unjustified cost imposed on farmers.

At present, there were only three Indian and two foreign Bt genes companies in the process of research and commercialization. And among the list of 36 institutions and 34 companies engaged in R&D of trans-genic crops, some are the sub-licensees of Mahyco-Monsanto. Till such time such companies or institutions are not in a position to enter the market, the respondent (Mahyco-Monsanto) is in a position to charge for this technology arbitrarily an unreasonably.

This is a landmark judgment, since it marks the first step that has ever been taken against the company whose poor quality Bt cotton has resulted in major losses for the farming community in almost all states where it was cultivated, mainly Andhra Pradesh, Maharashtra, Madhya Pradesh, Gujarat, Tamil Nadu and Karnataka. (Sharma 2006)

Claims for Compensation

Currently, the demand for compensation is quite strident. Farmers are hopeful after last year's verdict from the Jhabua District Consumer Forum, in Madhya Pradesh which ruled in favour of three farmers (Indu, son of Ramsingh, and Kaliya, son of Dangriya, of Dholyavad village, and Ajay Singh, son of Nansingh of Hattipura village). The Court asked Mahyco to pay Rs 1 lakh each as compensation. In the Badwani District Consumer Forum too, a case was registered against Mahyco-Monsanto. On April 27, 2004, Mohan, son of Bhimaji Yadav, bought Bollgard seeds (MECH-184 and MECH-162). The company's field officer told him to expect 30 quintals per acre, and assured him that no pests would attack the crop. Within three months, the crop dried

Bhan, Indu 2006, "Monsanto Held Guilty of Monopolistic Practices", 11 April 2006, Business Standard, New Delhi.

Sharma, Ashok B 2006, "DGIR Indicts Mahyco-Monsanto on Bt Cotton Case," 11 April 2006, Financial Express, New Delhi.

up suddenly. Mohan claimed Rs 2 lakhs as compensation, since he had followed the company's instructions fully. (Zaidi 2006)

When Agriculture Minister of Andhra Pradesh N. Raghuveera Reddy announced the decision of dragging the company to the Monopolies and Restrictive Trade Practices Commission (MRTPC) on December 28, 2005 for collecting an "abnormally high price", it would have come as a bolt from the blue for Mahyco-Monsanto. It became a watershed event. No State had ever dared to take on the multinational giant in this manner.

Along with Mahyco-Monsanto, three other seed companies, Pro-Agro, Raasi and Nuzuveedu, all producing and marketing Monsanto's Bt cottonseed, were made respondents. While filing the case before the Commission in New Delhi in January 2005, the Minister charged the company with indulging in "monopolistic trade practices with unreasonably high prices and limited technical developments".

The restrictive trade practices included "maximizing profits and market power and manipulation of the prices through the supply mechanism", he said. Since there was no patent over Bt cotton in India, the company was charging at "trait value" that was different from other countries.

The Minister alleged that the company sold seeds worth Rs 130 crores in India since 2002 and held back Rs 78 crores of this amount for itself as trait value. But it never responded to demands to pay Rs 3 crores as compensation to farmers whose crop had failed in Andhra Pradesh. (Venkateshwarlu 2006)

Cost-Benefit Analysis: Bt Cotton Farmers Worse Off

Table 3.18 shows a study conducted by Jafari (2005) about the economics of growing Bt cotton non-Bt cotton and Desi Varieties in one acre, in terms of input costs, yields and output value and found that Bt cotton farmers were incurring losses of upto Rs. 6400/acre on an average.

TABLE 3.18

	Bt Cotton Rs. Rs.	***Non Bt Hybrids Rs.***	***Desi Varieties Rs.***
A. Expenditure on Inputs (Seeds, fertilizers, pesticides, irrigation etc.)	Rs. 9700/-	Rs. 5750/-	None
B. Total Yield	2 quintals	10 quintals	5 quintals
C. Output Value	Rs. 3300/-	Rs 16500/-	Rs 8250/-
C – A	Loss of Rs. 6400/acre	Saving of Rs. 10750/acre	Saving of Rs. 8250/acre

(Jafari 2005)

Venkateshwarlu, K 2006, "Seeds of Discontent" Frontline, 27 January, 2006, Chennai.

Jafari Afsar H., 2005, "RFSTE/Navdanya Studies on The Performance of Bt Cotton in India; Field Trials to Commercialization: a History of failures, year 1998-2004" (unpublished).

TABLE 3.19

COST BENEFIT ANALYSIS OF BT. COTTON VS OTHER COTTON IN ONE ACRE IN MADHYA PRADESH

	Bt. Cotton	***Non-Bt Varieties***
A. Expenditure on Inputs (Seeds, fertilizers, pesticides, irrigation, labour)	Rs. 6675/-	Rs. 7005/-
B. Expected Total Yield	4.01 quintals	7.05 quintals
C. Output Value	Rs. 7218 (Rs. 1800/- quintal)	Rs. 13320 (Rs. 1800/- per quintal)
C – A	**Income of Rs. 543/- acre**	**Profit of Rs. 6315/- acre**

(Shiva et al 2003)

Similarly farmers in Madhya Pradesh are incurring a loss of Rs. 543 per acre in Bt cultivation but farmer growing non Bt are making profit of Rs. 6315 per acre. (Table 3.19). Table 3.20 shows that in Karnataka too farmers suffered loss of Rs. 1285 per acre in Bt cultivation where as non-Bt farmers have income of Rs. 3750 per acre.

TABLE 3.20

COST BENEFIT ANALYSIS OF BT. COTTON VS OTHER COTTON IN ONE ACRE IN KARNATAKA

	Bt. Cotton	***Non-Bt Varieties***
A. Expenditure on Inputs (Seeds, fertilizers, pesticides, irrigation, labour)	Rs. 8925/-	Rs. 10250/-
B. Expected Total Yield	3.82 quintals	7 quintals
C. Output Value	Rs. 7640/- (Rs. 2000/- quintal)	Rs. 14000 (Rs. 2000/- per quintal)
C – A	**Loss of Rs. 1285/- acre**	**Profit of Rs. 3750/- acre**

(Shiva et al 2003)

Table 3.21 gives the comparison of the findings from AC Nielson's study (commissioned by Monsanto) and Andhra Pradesh Coalition in Defence of Diversity (APCIDD) which is very interesting for the contrasting pictures they present.

As is apparent, the industry has claimed four times more than the actual reduction in pesticide use, 12 times more yield and 100 times more profit than the actual.

A report was released recently by Youth for Voluntary Action in association with Greenpeace India and Centre for Sustainable Agriculture. This suggests that

Shiva, Vandana etal 2003, "The Mirage of Market Access; How Globalization is Destroying Farmers Lives and Livelihood," Sept 2003, RFSTE/Navdanya, New Delhi.

TABLE 3.21

State	***Bollworm Reduction***	***Pesticide Usage Reduction***		***Yield Increase***		***Increase in Net Profit***
Andhra Pradesh	*%*	*Rs*	*%*	*Quintals /Acre*	*%*	*Rs/ Acre*
Monsanto Study	*58%*	*1856/-*	*24%*	*1.98*	*92*	*5138/-*
Andhra Pradesh: APCIDD Study	14%	321/-	2%	0.09	(-) 9%	(-) 750/-

(CSA 2005)

farmers who used non-Bt cotton in the 2005 kharif season had net incomes almost 62 percent higher than those who opted for Bt cotton. This was because in spite of having a marginally higher yield, the cost of cultivation for Bt cotton was much higher – by over 33 per cent. (Kaushik 2006)

In case of Bt cotton, average cost of cultivation was Rs. 6,184.11 per acre, yield 4.97 quintals per acre and sale price Rs. 1,843.60 per quintal, giving a gross income of Rs. 9,148.00 and net income of Rs. 2,963.95.

For non-Bt cotton, the average cost of cultivation was Rs. 4,138.16 per acre, yield 4.71 quintals per acre and sale price Rs. 1,898.00 per quintal, giving a gross income of Rs. 8,929.58 and net income of Rs. 4,791.00.

Thus, the average income of non-Bt cotton farmers was higher by Rs. 1,827.05 or 61.64 per cent, due to the lower cost of cultivation. The difference between average cultivation cost was Rs. 2045.95 or 33.08 per cent.

The economics of Bt and non-Bt production show that farmers who cultivated Bt cotton spent 15% of the total cost of cultivation on the seed as against 5% in case of non-Bt farmers, in the hope that it would reduce their spending on pesticide sprays and improve their yields substantially. But in reality, expenditure on plant protection was only around 25 rupees/ha less for Bt cotton farmers. Non-Bt cotton farmers averaged a yield of 276 kg/ha compared with 180 kg/ha for Bt cotton farmers, which represents a net 35% decrease in yield. So, in spite of spending 3.5 times more on pesticide-resistant seed, a Bt farmer had only a 4% reduction in pesticide costs, and ended up with a 35% loss in final yield. (CSA 2005)

These losses were compounded by the fact that the market value of Bt cotton was lower than non-Bt. To offset the reduction in the price of Bt seed cotton, almost all farmers resorted to mixing both Bt and non-Bt cotton before marketing. In the end, non-Bt cotton farmers netted four times as much as Bt farme3rs from their 2002-2003 cotton crop. Some 71% of Bt cotton farmers experienced losses, compared with 18% of non-Bt farmers. (CSA 2005)

Kaushik, Sarita 2006, "Bt Cotton Farmers Worse Off" April 7, 2006, Hindustan Times, Bombay.

Bt Cotton Survey (M.P. – Nimad) Appendix – I

District	*Village Name*	*Name of the Farmers*	*Yield per acre in Quintals*	*Expenses per acre (Rs.)*
Khargone	Dudhariyakhedi	Habib S/o Roshan	0.6	2000
	Dudhariyakhedi	Kishan Lal Mangila	7	4000
	Dudhariyakhedi	Sher Singh S/o Gyan Singh Chauchan	0.75	5000
	Dudhariyakhedi	Radheshyam Nathu	5	3000
	Dudhariyakhedi	Chand Khan Mangu	1.25	4000
	Dudhariyakhedi	Antar Singh S/o Umraw Singh	3	3000
	Dudhariyakhedi	Kamal Singh S/o Lotan Singh	4.5	5000
	Dudhariyakhedi	Nein Singh S/o Umraw Singh	7	8000
	Dudhariyakhedi	Chogalal S/o Geindalal	2	6000
	Dudhariyakhedi	Sunder Lal Kuchwaha	3	4000
	Dudhariyakhedi	Rameshwar S/o Sobha Ram	3	3000
	Dudhariyakhedi	Mohan Singh S/o Chandu	1.5	2000
	Dudhariyakhedi	Bihar Singh S/o Rameshwar Singh	2	2500
	Bad gaon	Dashrath	2.5	8000
	Bad gaon	Shiv Ram S/o Mangilal	2	12000
	Bad gaon	Hemraj S/o Champalal	2	10000
	Bad gaon	Kalu Ram S/o Nathu	1.2	3400
	Bad gaon	Dinesh S/o Ganpati	2	3500
	Bad gaon	Gokul S/o Bulia	1.2	12000
	Bad gaon	Naresh Kumar S/o Khato	2.5	3000
	Bad gaon	Jagannath S/o Faltu	1.5	13000
	Magriya	Hari Ram S/o Daya Ram	1.25	4000
	Magriya	Mahesh S/o Nawal Singh	4	6000
	Magriya	Kishan Singh S/o Dhan Singh	3	7000
	Magriya	Kailash S/o Nawal Singh	5	5500
	Meharja	Gajraj Singh S/o Mangal Singh	2	5000
	Meharja	Manhor Singh	45	4500
	Gopalpur	Sheikh Mukhtiyar	3.5	3000
	Gopalpur	Sheikh Zahur	5	4000
	Gopalpur	Shankar Singh S/o Kuwar Jee	3.3	2500
	Gopalpur	Mohabbat Singh	3	13000
Dhar	Raipuria	Shobha Ram S/o Punja Jee	3	3000
	Raipuria	Kami Ram S/o Khemraj	6 – 7	9000
	Raipuria	Kami Ram S/o Panna Jee	5	6500
	Jalothiya	Kalu Singh S/o Harzi	0.6	4000
	Jalothiya	Radhu S/o Kalu	1.5	3000
	Jalothiya	Mangelal S/o Gangaram	2.5	5000
	Jalothiya	Bhadhur S/o Harzi	3	4000
	Sukliter	Bhawan Singh S/o Mulji	6	4500
	Sukliter	Mayaram S/o Kalu	2.5	3000
	Sukliter	Kailash S/o Daljee	8 - 10	4000
	Sukliter	Budha Singh S/o Poon	7	4000

	Sukliter	Gulab S/o Shoba Ram	5	6500
	Sukliter	Jam Singh S/o Galjee	5	5000
	Sukliter	Heera Lal S/o Ulfa	4	3000
	Kalada	Pratap	6	7500
	Kharadi	Dayanand S/o Ram Singh	5	8000
	Khalkhad	Tilak Bhai S/o Raja Ram	4	3000
	Koonda	Ramesh S/o Ganga Ram	2.5	7000
	Koonda	Rajan S/o Haresh Jee	3	5000
	Lunhera	Hemant S/o Radheshyam	1.5	4000
	Lunhera	Ram Chand S/o Gopal	4	4000
	Lunhera	Bhagirath S/o Bhagwan	5	4000
	Dhamnod	Ganesh Dhariya	.5	
	Sundret	Santosh Patidar S/o Ganesh Patidar	7	
	Goi	Vasudev Swami	9	10000
	Goi	Badri Prasad	8	5000
	Mudgaon	Rameshwar S/o Gulal	5	3000
	Mudgaon	Nander Singh Jugadia	Failed	5000
	Mudgaon	Jatan Singh S/o Shadu	1.5	7000
	Mandil	Shankar S/o Jam Singh	0.3	2000
	Mandil	BhangiS/o Bechar	0.8	5500
	Mandil	Khema S/o Jugadia	5	2000
	Pishnawal	Sukhlal S/o Bhasriya	Failed	2000
	Pishnawal	Chamar S/o Joshia	Dried Up	3000
	Pishnawal	Ganga Ram S/o Tej Singh	8	6500
	Jogwada	Vasudev Patidar	5	5000
	Jogwada	Shiv Charan Patidar	Dried Up	2500
	Jhopali	Asha Ram S/o Dhanna Lal	2	7000
	Jhopali	Daula S/o Ragunath	4	4000
	Jhopali	Rajkumar S/o Bhim Singh	3	
	Jhopali	Kashi Ram S/o Mango	8	5000
	Jhopali	Bhaidass S/o Shabaria	2	7000
	Jhopali	Jhurla S/o Shabaria	1.5	2500
	Chatlikedi	Prem Singh	Failed	2000
	Sendhwa	Ashwani Kanungo	4	5000
Badwani	Pichodi	Manohar Singh S/o Parwat Singh	Failed	3500
	Pichodi	Chander Singh S/o Bau	1	2500
	Pichodi	Madan S/o Rokadia	Dried up	2500
	Pichodi	Manohar S/o Mangat	Dried up	2500
	Pichodi	Sitam Ram S/o Govind	7.5	7000
	Pichodi	Ratan Singh Patel S/o Pratap Singh	2.5	2500
	Pichodi	Madan Bhai S/o Rukroo Singh	8	9000
	Pichodi	Dashrath S/o Manga	5	4000
	Katora	Radheshyam S/o Bange	4	3500
	Katora	Bharat S/o Mehta	10 - 11	1000
	Katora	Mahesh S/o Lal Singh	3.5	5000
	Palia	Bandar S/o Madyu	3	3500

	Palia	Ganga Ram S/o Banka	4	3000
	Palia	Khaniya S/o Mohan Singh	10	10000
	Palia	Daya Ram S/o Lonia	12	10000
	Palia	Mukesh S/o Kishan	3	
	Palia	Manna Lal S/o Bhim Singh	2	2500
	Sondul	Shiva Bhai S/o Vishramdhan	11 - 12	
	Sondul	Santosh S/o Chhaganlal	6	
	Sondul	Gainda Lal S/o Varuji Kumawat	3	7500
	Sondul	Bhima S/o Varuji Kumawat	2.5	6000
	Sondul	Girdhari S/o Varuji	1	3500
	Jhamta Awalda	Hari Singh S/o Bishan	1.5	5000
	Jhamta Awalda	Sumer Singh S/o Ram Singh	2	4500
	Jhamta Awalda	Chander Singh S/o Shoba Ram	2.5	5500
	Jhamta Awalda	Shoba Ram S/o Jhagun	3	6500
Khandwa	Chhota Borgaon	Mangu S/o Navi Baksh	4	4000
	Chhota Borgaon	Asha Ram Patel	6	5000
	Chhota Borgaon	Vasudev Patel	7	5000
	Chhota Borgaon	Yashwant Patel S/o Sita Ram Patel	2	3000
	Lohari	Ram Chandar	5	4000
	Bawangaon	Devi Lal S/o Panna Lal		
	Bawangaon	Dev Ram S/o Mohan	4	3500
	Ladanpur	Rajesh S/o Champa Lal	10	4000
	Lohari	Shankar S/o Sita Ram	3	6000
	Lohari	Poonam Chand S/o Thakurjee	10	5000
	Korgalan	Nitish Patel	8	5000
	Panjaria	Dhanna Lal Patel	Dried Up	2500
	Panjaria	Shree Ram Patel	Dried Up	3500
	Panjaria	Jhajju Bhai	Dried Up	4500
	Panjaria	Ramdhan Bhai	Dried Up	4000
	Panjaria	Laxmi Narayan	Dried Up	5000

BT Cotton Survey in (Maharastra - Vidharbha) Appendix-II

District	*Village Name*	*Name of the Farmers*	*Yield per acre in Quintals*	*Expenses per acres (Rs.)*
Yavatmal	Hiwarawarsa	Ukhand Mandre	3.5	12000 - 13000
		Suresh Burnwal	4	12000
		Bhagwant Rai	2	10000
		Tulsiram Mandre	Failed	8000
	Sunna	Pramod Jiddewar	5-6	10000
		Dev Rao Mamedwal	4-5	10000
	Tiwasa	Yashwant Rao	7.5	10000
		Narender Rathor	Failed	7000
		Ajay Raut	5	6000
		Waman Rathor	3-4	10000
		Dhanraj Rathor	7.5	15000
		A.M. Subedar	Failed	9000
	Jamwadi	Rane Dey	2.5	7500
		Punjab Rao Authree	1.5	8000
Amarawati	Katora	Kailash Kalwade	1.2	6000
		Neelkanth	1.5	5500
		Sanjay Sunani	2	6000
	Nandora	Ramesh Aggarwal	7	5000
		Syed Sabir	2	3000
		Sudhakar Govind Rao	Dried Up	2000
		Shekh Hashim	0.75	3000
		Dada Rao Bhamura	2	
		Ramesh Namdev	1.5	
		Shekh Kalam Mohd.	1	3500
	Pusda	Sahibrao Piraji	Failed	4500
		Ganesh Manikrao	0.5	5000
		Shiv Ram Dhondunji Thorat	1.5	6000
	Sirala	Bhavrao Babarao	2	5000
		Mazhi Rao Samrit	2	6000
		Praful Ramkrishna	3	7000
	Borala	Kishor Hingola	3	5000
	Badgaon	Ramesh Mawre	2	5000
		Bapurao Mahadev Rao	2	5500
		Kishan Rao Bhambukar	1.5	6000
		Suresh Ramkrishna	1	3500
		Sudhir Nirmal	2	4000
		Rajender Nirmal	8	6000
		Manhar Bhadkar	Failed	5000
		Mama Sahib Nirmal	Failed	5500
		Ashok Rao Nirmal	Failed	7000

	Naya Akola	Goonduji Jayramji Ingle	Failed	2000
		Mohandas Meshram	1	4500
		Nirmal Gayakwad	0.75	2500
		Themabhai Chhapan	0.5	2000
	Jultapur	Hariya Jambarkar	0.5	
		Panduram Jahale	1.5	4000
		Shridhar Krishanrao	1.5	3500
		Bilashrao Vidhyarao	1.5	-
	Jalka	Mahadevrao Vithalrao Sahukar	3.3	6000
	Bandarkhed	Punjab Rao Ganesh Rao Raut	5	7500
	Kamanja	Sekh Navi Sekh Biram	Failed	6000
		Rakesh Maldure	1.5	5000
Wardha	Bhoogaon	Purshotam Golkar	4	8000
		Gajanand Mahadeva	3	7500
		Subhas Wankhade	2.5	7000
		Balusawant	3	6500
		Gajanand Sawant	4	-
		Krishna Khumanakar	6	10000
		Ramu Tumram	1	3000
		Gajanand Dhopte	6	2500
		Manohar Lokhande	6	2500
	Selukate	Ashok Thoor	1.5	7000
		Rakesh Thoor	4	7000
		Dilip Kamde	Failed	4000
		Niranjan Kamde	5	8500
		Surender Kamde	1.5	2500
		Ashok Thoor	7	5000
		Sukhdev Thoor	Failed	6000
		Sharad Babulkar	4	6000
	Waigaon	Purshotam Punjab Rao	2	3000
		Bhagwan Hiwasi	2	4500
		Manhor Hinge	4	6000
		Kamal Kishor Chandak	4	5500
		Gajanand Dhage	Failed	4000
		Gyan Bhaji Supare	Failed	6000
		Tailang Narangrao	2	3500
	Injjapur	Pramod Bhagwan Warghat	4	
		Mohan Warghat	3	7000
		Manmohan Ladda	3.5	4000
	Isapur	Prabhakar Rao Amarkar	6	3000
		Suresh Galnde	4	3000
		Tukaram Bhoyar	2	2000
		Syed Javed Ali	3.5	9500
		Jitin Gambhir	3	

	Husnapur	Hemant Shinde	1.5	7500
		Miland Mahadevrao Tajne	1	8000
		Uttamrao Konwagi	1	7000
		Bhagat Konwagi	1	8500
	Bafgaon	Rambhauji	8.5	10000
		Gopal Gawarkar	5	8000
		Madhukar Darni	5	10000
		Bhaskar Rao Ashtkar	3.5	8000
		Gyaneshwar Rao Maheshwar Rao	3.5	7000
		Vilas Darni	2	7000
		Vasudev Mahadev Gawakar	2	7000
		Gajanand Lokhande	1	8000
		Bhagwan Shailke	2	4000
		Roopchand Wamanrao Patil	0.75	5000
		Koruji Patil	2	6000
		Yogesh Wamanrao Lokhande	1	12000
		Vinayakrao Ramkrishna	1.5	7800
	Selsura	Rahul Engde	1	7500
		Vijay Akhude	5	2500
	Salodh	Tukaram Ladekar	2	6000
		Rajendar Panduramji	2	8000
		Namdev Rao Jhade	Failed	3000
		Shri Krishna Gopichand	3.3	6000
		Ashok Jamde	3	4500
		Gajanand Bidkar	5	8000
Nagpur	Pipla	Ratnakar Sawarkar	6	4000
		Nathu Bhaiji	3.5	5000
		Manoj Devaji	4	2700
		Narad Moharat Rao	3	7000
		Dinakar Sawarkar	3	6500
	Isapur	Nathu Makne	2	4000
		Chandarbhan Kubadkar	1.5	7500
	Patan	Mohar Bable	2	
	Khapa	Shantaramji Borde	1.75	6500
	Hingna	Nanaji Dote	3	6500
		Madhukar Dodke	2	
		Seshrao Ganchakar	4.75	8500
		Krishanji Adekar	2.5	7500

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CHAPTER IV

Seeds of Suicide

The Ecological & Human Costs of Genetic Engineering and Globalisation of Agriculture

Introduction

Seeds of Suicide study takes stock of the impact of a decade of trade liberalisation that has impacted the lives and livelihood of farmers and transformed them into negative economies through propagating non-sustainable agriculture practices. Across the country farmers are taking the desperate step of ending their life because of the new pressures building upon them as a result of globalisation and corporate take over of seed supply leading to spread of capital intensive agriculture. The lure of huge profits linked with clever advertising strategies evolved by the seeds and chemical industries and easy credit for purchase of costly inputs is forcing farmers into a chemical treadmill and a debt trap. The reality of globalisation is different from the corporate propaganda and from the promises of trade liberalisation and agriculture offered by the World Bank, the WTO and experts and economists sitting in our various ministries.

The impacts of trade liberalisation and globalisation have been felt in each and every state with the states of Andhra Pradesh, Karnataka, Maharashtra and Punjab bearing the maximum burden in terms of the high social and ecological costs in terms of farmers paying for globalisation by being forced to sacrifice their lives and livelihoods. In what follows we present the scenarios from these states on the status of farmers suicides, since December 1997 when farmers suicides first acquired epidemic proportions, the Research Foundation for Science, Technology and Ecology has been continuously monitoring and analysing the causes of farmers suicides.

The epidemic of farmers' suicide is the real barometer of the stress under which Indian agriculture and Indian farmers have been put by globalisation of agriculture. Growing indebtedness and increasing crop failure are the main reasons that the farmers have committed suicide across the length and breath of rural India. Indebtedness and crop failure are also inevitable outcomes of the corporate model of industrial agriculture being introduced in India through globalisation. Agriculture driven by MNC's is capital intensive and creates heavy debt for purchase of costly inputs such as seeds and agri-chemicals. It is also ecologically vulnerable since it is based on monoculture of introduced varieties and on non-sustainable practices of chemically intensive farming.

The suicides by farmers highlights these high social and ecological costs of the globalisation of non-sustainable agriculture which are not restricted to the cotton growing areas of these states but have been experienced in all

commercially grown and chemically farmed crop in all regions. While the benefits of globalisation go to the seeds and chemical corporation through expanding markets, the cost and risks are exclusively born by the small farmers and landless peasants.

The two most significant ways through which the risks of crop failures have been increased by globalisation are the introduction of ecologically vulnerable hybrid seeds and the increased dependence on agri-chemical input such as pesticide, which are necessary to be used with pest prone hybrids.

The privatisation of the seed sector under trade liberalisation has led to a shift in cropping patterns from polyculture to monoculture and a shift from open pollinated varieties to hybrids. In the district of Warangal in Andhra Pradesh, this shift has been very rapid, converting Warangal from a mixed farming system based on millets, pulses and oilseeds to a monoculture of hybrid cotton.

The problem of pests is a problem created by erosion of diversity in crops and cropping patterns and the introduction of commercial hybrid seeds. The most sustainable solution for pest control is rejuvenating biodiversity in agriculture. Non-sustainable pest control strategies offer chemical or genetic fixes while reducing diversity, which is the biggest insurance against pest damage.

As the cotton disaster shows, the globalisation of agriculture is threatening both the environment and the survival of farmers. Biodiversity is being destroyed, the use of agri-chemicals is increasing, ecological vulnerability is increasing and farmer debts are sky rocketing leading to suicides in extreme cases.

1. The Andhra Pradesh Scenario of Farmers' Suicides

From Mixed Farming to Monocultures: The Lure of "White Gold"

More than 16,000 farmers have committed suicide in Andhra Pradesh alone from 1995 to 1997 (Observer, 8th June 1999). Taking into consideration the large number of suicides during 1998 and 1999 it is possible that by early 2001 the farmers' suicides will across nearly 20,000 in Andhra Pradesh itself.

Cotton cultivation has been taken up in areas, which were not traditionally cotton growing areas. One such region is Warangal district in A P, which has switched over from predominantly food crops to cotton, which is relatively a new crop, brought under trade liberalisation. The area under cotton in this region grew over three times in a decade's time.

In Warangal, over three decades (between 60s to 80s) the total acreage under cotton crop was negligible. According to the available data, in 1986-87 the total area under cotton cultivation was 32792 hectares (or 81980 acres) which increased to 100,646 hectares (or 2,51,615 acres) in 1996-97, which is nearly three times. The cotton cultivation has basically replaced the jawar crop. The area under jawar in 1986-87 was 77884 hectares, which went down to 27306 hectares in 1996-97. The acreage under the traditional paddy has also shrunk. The land under bajra (millet) has also decreased in the last ten years. In 1986-87, total land under bajra was 11289 hectares which has drastically reduced to just 400 hectares in 1996-97.

The acreage under cotton increased because the farmers in Warangal were getting a good return on cotton. But 1997-98 turned out to be different. There

G. Mahendar of Mulkaligud village in Warangal District bought Excel cotton seed last year, after being lured by company's advertising propaganda. The company dealers took two jeep-loads of farmers to the trial fields of Excel cotton everyday and informed them that the variety yield 18 quintals per acre. Farmers in Mulkaligud and neighboring village planted 35,000 acres of land with the variety. The crop did not perform well; the plant shed the bolls it developed.
The farmers complained to the dealer in their area and demanded compensation, following which many company officials visited the farmer households and conducted elaborate surveys. However, so far no compensation has been paid to the farmers. Instead the dealer threatened that he will close the shop in their area and open a new shop in some other area.

was a heavy damage to the cotton crop in this season due to several reasons. The most important reasons for the crop failure were bad weather and a severe pest attack. There was drought in June-July, which is the main sowing season for cotton. Due to the drought condition only 15% paddy could be planted. In Oct - Nov the rain came during the cotton boll-bursting season. The untimely rain also affected the paddy because it was in the maturity period. The cloudy weather, untimely rain and lack of winter in Nov-Dec led to the emergence of pests.

In 1997 the pests first emerged in the chilli fields and the weather helped them to multiply. The pests attacked all the crops, which were in the field e.g. chilli, cotton, red gram etc; the yield thus fell down heavily. Since several sprays of chemicals had already been made by that time, they had no effect on the pests. The more the chemicals failed, the more they were used. The panic created by the pests led to heavy dosage of pesticides sprayed at frequent intervals in the cotton fields.

The focus of cotton failure has been on the excessive use of pesticides or of spurious pesticides. However, pesticide use is intimately linked to hybrid seeds. Pesticides become necessary when crop varieties and cropping patterns are vulnerable to pest attacks. Hybrid seeds offer a promise of higher yields, but they also have higher risks of crop failure since they are more prone to pest and disease attack as illustrated by the Andhra Pradesh experience. Monocultures further increase the vulnerability to pest attacks since the same crop of the same variety planted over large areas year after year encourages pest build-ups.

Farmers Suicides in Andhra Pradesh

Within the span of three years, 2000-2003 there were 688 cases of suicides committed by farmers in just 20 districts of the State. Out of the 490 suicide cases in the country in 2002, Andhra Pradesh alone accounted for a major share of 385 cases. (Choudhary 2003) Table 4.1 gives the list of some farmers who committed suicide in Andhra Pradesh. Even during the 2003, as many as 169 farmers have committed suicide. Cotton growers are worst victims of government's misplaced priorities and misconceived planning.

For the cotton growers of the state, the failure of the crop and heavy slump in the market price of cotton was so dreadful that the only course left to them was to commit suicide rather than face the ruthless and unsympathetic state machinery for adopting stringent and coercive methods for recovery of loans. Grim situation arising out of recurring drought for the last four years, unavailability of government and institutional loans to small and marginal farmers, slashing of agricultural and power subsidy leading to escalation in production cost, downslide in market price of agricultural commodities, and

Choudhry, Krishan Bir, "Editorial" Farmers Forum, vol. 3, No. 10, October 2003.

dismantling of agricultural extension services as well as closure of Public Distribution System are the contributing factors forcing the farmers to commit suicide.

The land cultivated by the deceased farmers constituted both owned and leased, and majority of them had land not exceeding three acres, both wet and dry. Farmers having small holdings were prone to the crisis. The number of sources of debt was one source (42 per cent), or two sources (44 per cent), or three sources (14 per cent). No pesticides were supplied by the government agencies. Private companies and multinationals have supplied most of the seeds. In the sate, there are 13,540 licensed pesticide shops. Many farmers had tie-up with these shops for seeds and pesticides. Money lenders and landlords constituted 27 per cent of the total source of borrowings, 32 per cent from friends and relatives, 14 per cent from fertilizer shops and middle men, and banks and cooperatives provided only 14 per cent and 12 per cent respectively.

At an estimated 35 per cent of farmers had borrowed Rs. 50,000 or less, 33 per cent had loans between Rs. 50,000 to 1,00,000. When 23 per cent had between one lakh and 1.5 lakh, and four per cent had 1.5 lakh to two lakhs, about four per cent had above two lakhs. Loans spent by the deceased were for seeds, fertilizers and pesticides (89 per cent), digging borewell (6 per cent) and marriages (3 per cent).

Between 1997 and the end of 2000, in just one district of Anantpur in Andhra Pradesh, 1,826 poor (mainly farmers) committed suicides. Most of the deaths were debt related. Rising input costs, falling grain and oilseed prices, and refusal of loans by banks – all policy driven measures – have crushed the farmers. Many who felt that they could no longer feed their families honorably took their lives. Most of them swallowed the pesticide 'monocrotophos,' the input provided free to farmers by the government. But the police gave different versions. As many as 1061, i.e., over 58 per cent were reported due to sickness. The police version of suicides went unchallenged. Even more bizarre was the fact that large number of these went into records as those who had killed themselves due to 'unbearable codoppu noppi' (stomach ache). These farmers were being handed for repayment of amounts as small as Rs. 316, in contrast to reports, which showed how banks have written off over Rs. 8000 crores owed by a handful of powerful corporate houses. Indeed, by imposing duties that minimize the impact of cheap imports, the government accounted Rs. 5000 million to bail out the plantation sector. However, the small producers are driven out by cheaper imports, while major producers have their losses written off.

In Anantapur district of Andhra Pradesh, the population is sparse and farming is limited. With one crop per year, it is totally depending on erratic monsoon. Making a living here is a tough business at the best of times. Today, cheap Malaysian Palmolin imports, following trade liberalization and reduced import tariffs, have led to the erasing of groundnut price and to starvation in the last three years. 243 farmers have committed suicide in Anantapur district alone. Of these, 55 were women and five girls, depressed at their pathetic condition and crop failure. (Chacko 2003)

Chacko, Arun, 2003, "Cheap Imports drive Farmers to Suicide: Making a Living becoming more and more difficult," The Tribune, 4 December 2003.

Fifty-year-old K. Leelavatamma's husband had six acres of land in Chowkunti village. He took loan form moneylenders some years ago. But between indifferent crops and crashing groundnut prices, he realized that there was no way he could repay his loan. On 4 March 2003, the day of Mahashivaratri festival he took his life. His widow sold half of her landholding to repay their debt; she is left with no family income, and now works as agriculture labour.

Twenty five year old Manjula's story is even more tragic. She was ill and her husband, 31-year-old Ramanna, farmed two acres of land, and borrowed a total of Rs. 70,000 from several moneylenders to treat her problem. The shame and helplessness of the situation forced him to take his life. Manjula is left with two children.

Basically, given the international trade situation, it is not a great time to be in the groundnut farming business. The groundnut crop became uneconomical, once the Central government started importing Palmolin at Rs. 20 per kg. Today, palmolin is available in the market at Rs. 40 to 52 per kg. The retail prices for groundnut oil range from Rs. 52 to 56. Predictably, groundnut oil is not selling very well. The Anantpur farmer needs a return of Rs. 40 per kg for their groundnut. Currently, the farmer only gets about Rs. 20 per kg. This has led to a vicious downward spiral of poverty. Farmers are not able to sell their groundnuts at a reasonable price because of cheap palmolin imports.

Royalseema areas of Andhra Pradesh face severe drought conditions. For the last five years, there has been no rain in August and September, causing the crop to fall. Bits of rain in August and September provide the moisture for the groundnuts to form. With no other crop with the potential to replace groundnut, the situation is truly desperate and rural indebtedness is rife.

A good crop of groundnut should yield 1,500 kg per hectare, while an excellent one gets 2,500 kg. The Anantapur farmers are only managing 200 kg per hectare – just enough for sowing. This meant the crop is too uneconomical to harvest and is left in the field to rot. At this point, the future undoubtedly seems bleak, and more than bleak with the opening up of the economy and import of palmolin. Sadly, despite the groundnut farmers being in such dire straits, little official help seems forthcoming.

TABLE 4.1
Some of the Farmers Who Committed Suicide in Andhra Pradesh in Recent Years

Sl. No.	*Farmer's Name*	*Village*	*District*
1	Dubashi Rajayya	Narsimpalli	Medak
2	Chikkali Ramulu	Tumkimetla	Mehaboobnagar
3	Kommala Mallayya	Paddapuram	Warangal
4	V. Narasimga Rao	Papayya Palli	Karimnagar
5	Jangu Ravi	Venkatapur	Warangal
6	Narasimha Reddi	Gorlaveedu	Warangal
7	Harmandlu	Modnoour	Nizamabad
8	Natutta Ravi	Kamaram	Warangal
9	Malkalla Ramreddi	Kammarvalli	Adilabad
10	Lakkarru Mogili	Kamaram	Warangal

11	Syamala Mallayya	Nargaram	Warangal
12	Kallepalli Mallayya	Kesavapur	Warangal
13	Srinivasulu	Dharmavaram	Medak
14	Chavarthi Veeraswami	Chintapalli	Warangal
15	Katta Padi Reddi	Yacharam	Nelgonda
16	Yara Sudhakar Reddi	Eessipet	Warangal
17	Kakamonu Veerayya	Visadala	Guntoor
18	Dasari Acunjayya	Goodem	Warangal
19	Ramelvar Gulab	Shampabad	Adilabad
20	G. Rajemdar	Usenpalli	Warangal
21	Nageri Kishan Rao	Eela Kurthi Haveli	Warangal
22	Lurdu Raju	Khammam Goodom	Nelgonda
23	Bandi Kalavathi	Venkatapur	Warangal
24	Khadavat Mangya	Nandya Nayak	Warangal
25	Manupalli Sarayya	Mangapet	Warangal
26	Arula Jagganayya	Malliuduria	Warangal
27	Gangaram Balayya	Peddapuram	Rangareddi
28	Eejagiri Ramabadra	Papayya Palli	Warangal
29	Dasandla Bhumalingam	Chilva Codooru	Karimnagar
30	Cabygyka Sambayya	Serabayyapalli	Warangal
31	Vyasa Srinu	Tanikella	Khammam
32	Gandra Bikaspati	Pegada Palli	Warangal
33	K. Sanjeevayya	Alirajpet	Medak
34	Banotuswami	Bollapalli	Guntoor
35	Galivelu Subba Rao	Peda Nandipadu	Guntoor
36	Dasari Pedda Chennayya	Veepangandla	Karnool
37	Nerati Mallayya	Biranpalli	Warangal
38	Pendli Aanjayya	Dharma Rao Pet	Warangal
39	Khallipalli Ashok	Peddapalli	Kharimnagar
40	Ajmeera Surya	Narayan Tanda	Warangal
41	Pandari Sarayya	Mangapeta	Warangal
42	Eedula Kanti Narshimha Reddi	Pochannapeta	Warangal
43	Kanakayya	Gummadidala	Medak
44	Damodar Reddi	Ummentyala	Mehaboobnagar
45	GolkondaEellayya	Kogil Vayee	Warangal
46	Allepu Radamma	Narsapur	Warangal
47	Kumar	Veleeru	Medak
48	Darga Aanjayya	Manikyamma Goodou	Ranga Reddi
49	Jagiri Komarayya	Ninaala	Warangal
50	Pidialli Rajamallu	Dharmaram	Kharimnagar
51	M. Ella Reddi	Veldada	Warangal
52	Gollavaggu Sateyya	Gundlapalli	Medak
53	Gollavoggu Pramcela	Gundlapalli	Medak
54	Vinaala Sambayya	Kesavapuram	Warangal

55	Madduri Hanimi Reddi	Aaknooru	Karimnagar
56	Viswanadhan	Balugoppa	Buantapuram
57	Tirumala Reddi	Panderlapulli	Karnool
58	Nammi Reddi Srinivasa Reddi	Vernula Palli	Nelgonda
59	Machcha Chandramouli	Kamalapur	Karimnagar
60	Mutyala Lakshmi	Kamalapur	Karimnagar
61	Anand	Sitarampuram	Warangal
62	Yausafmia	Aaliyabad	Medak
63	Buchayya	Pegadapalli	Warangal
64	Mediboina Ramulu	Chinnayagoodem	West Godavri
65	Eemmani Balanjineyulu	Tekula Kurpa	Khammam
66	Banootu Bitya	Sitampeta	Khammam
67	G. Krishnayya	Yeskoru	Khammam
68	Tenali Nagulu	Marsukunta	Khammam
69	Hillikoonda Jagannadham	Sirooly	
70	Venkata Reddi	Gummadidala	Medak
71	Venkata Reddi	Lingampalli	Nelgonda
72	Dharmasotu Lakshmi	Jagannadapuram	Khammam
73	Katla Komrayya	Narsingapur	Warangal
74	Gousu	Teegul	Medak
75	Vemula Aayelayya	Bhupatipur	Karimnagar
76	Battula Narasimhulu	Ganda Boyianapalli	Chittur
77		Kumbamvaripalli	
78	Chinna Venkata Danayya	Chandragoodem	Krishna
79		Borragoodem	
80	Bhukya Sankar	Eeryatanda	Warangal
81	Gaogu Ayyellayya	Gaorremkunta	Warangal
82	Chinta Vijay	Vangavahad	Warangal
83	Mamidi Lachavva	Rechapalli	Karimnagar
84	Vuyyuru Krishna Reddi	Vuppalachalaka	Khammam
85	Masetli Bhumanna	Yaaval	Adilabad
86	Somayya	Jamikunta	Warangal
87	Katkuri Kanakamallu	Gurrekunta	Warangal
88	Pantulu	Papayyapeta	Warangal
89	Aalasyam Venkateswaralu	Polisettigundam	Warangal
90	Negarakanti Yellayya	Manasapalli	Warangal
91	Tuppata Mallayya	Timmapur	Medak
92	Kavarla Ramesh	Begampeta	Medak
93	Bonaala Saramma	Gurrampalli	Karimnagar
94	Kalipeni Venkatayya	Sriampur	Karimnagar
95	Dhannasam Hanmayya	Mudgulchittempalli	Ragareddi
96	Bollineedi Siddarao	Rimmanagooda	Medak
97	Chaliti Nammireddi	Nagaram	Warangal
98	Aasuaka Narsooji	Kadivendi	Warangal

99	Eengoli Chinaramulu	Nandigama	Warangal
100	Balabi Badrayya	Bagrolipeta	Warangal
101	Samini Lakshmi	Ramanjapuram	Warangal
102	Lakshmamma	Tanduru	Khammam
103	Devara Srisilam	Pedda Madooru	Warangal
104	Pjanha Reddi	Ganggalapalli	Mehaboobnagar
105	Pittala Samkar	Jayagiri	Warangal
106	Choudarapu Yellayya	Mahmadapuram	Warangal

A study on farmers' suicides in Andhra Pradesh was undertaken by AWARE, an NGO, to identify various factors that led farmers to commit suicide and to suggest possible solutions to avert such suicides in future. The study included 307 suicide cases, majority of which were from Telangana region (250 cases). The farmers who committed suicides were mostly cotton growers. Out of 92 sample farmers surveyed, 89 per cent were cotton growers. The reasons attributed for suicides were mostly crop failure due to pests and use of defective pesticides. Only six per cent of the farmers were able to get technical advice from mass media and the major sources of technical advice were from private pesticide shop owners. The amount of debts of the deceased farmers ranged from less than Rs. 50,000 to more than 1.5 lakh. The range included Rs. 50,000 or less (35 per cent), Rs. 50,000 to 100,000 (33 per cent), 1 lakh to 1.5 lakhs (23 per cent), and more than 1.5 lakhs (4 per cent). The loan spent by the deceased farmers was on seeds, fertilizers and pesticide (89 per cent), digging borewell (6 per cent) and for marriages (3.5 per cent). The most common method adopted to commit suicide was consuming pesticide (90 per cent) followed by hanging (8 per cent) and drowning (2 per cent). According to P. V. Ramanna, Director of AWARE, almost half of the farmers died under 40 years of age.

A Survey conducted by Andhra Pradesh Ryot Union identified the policy of liberalization as primarily responsible for suicides. The liberalization process affected worst the small and marginal farmers. To check-up the increasing suicidal deaths in the state, National Human Rights Commission had assigned K. R. Venugopal, a retired IAS Officer, the responsibility to find out the actual cause of mass suicides. Venugopal cited lack of cooperation on behalf of the State Government as the cause. He also recommended special compensation of Rs. 3 lakh to the families of those who committed suicides. It may be mentioned that only 20 per cent of farmers received assistance in agriculture while the rest (80 per cent) had to knock the door of private moneylenders for their needs. Moneylenders charge interest to the tune of 36 to 120 per cent. (Burmesh 2003)

Privatisation and the Spread of Monocultures

Since Warangal is a non-traditional cotton region, therefore no native variety of cotton is found. All varieties of cottonseeds used in Warangal are hybrid seeds sold by private companies. Various seed companies are providing high yielding varieties of cotton and truthful seeds due to the huge demand of cottonseeds.

Burmesh, Kamal, "Andhra is a Suicide State", Sahara Times, 4 October 2003.

For any company to launch certified seeds takes atleast six to seven years' process of undergoing trials and verifications in the supervision of government authorities. However to avoid such delays in the launch of seeds in the market, seed companies sell the seeds as "truthful" seeds, which means that the company sells seed on the basis of farmers having confidence in the company's claims. There is no regulation to prevent marketing of "truthful" seeds.

In 1970's cotton cultivation in Warangal was dependent upon the varieties developed by the public sector seed supply. During that time the most popular variety was hybrid - 4, a short staple cotton variety. Besides Hybrid - 4 (H-4), the other varieties used during the 70's and 80's were MCU - 5 (developed by Coimbatore Research Station); L. K. varieties (which was resistant to white fly and jassids); Varalakshmi (developed by Cotton Research Station, Nandyal); JKHY-1 (an HYV developed by Jawaharlal Nehru Krishi Vidhyalaya, M.P) amongst others. All these varieties were government varieties, which were cultivated in the Telangana region.

However, during eighties a handful of private companies participated in cotton research and evolved a number of hybrid cotton varieties. These included Maharashtra Hybrid Seeds Company, Jalna (Mahyco); Mahindra Seeds Company, Jalna; Nath Seeds Company, Aurangabad amongst others. These companies captured the entire market for cottonseed production and distribution.

The most popular variety of cotton in Warangal based on yields during 1995 – 1997 was RCH - 2, a long duration 'truthful' hybrid variety, produced by Rasi Seeds Company, and marketed by J. K. Company, Secundrabad. Other varieties of cottonseeds grown by the farmers and the acreage under each variety in Warangal during 1996 - 97 is given in Table 4.3.

Similarly in Adilabad the most popular variety during this period was the L. K. variety which is a short duration variety. While the MCU varieties were popular in Khammam district. The choice of variety for a particular region depends upon its soil condition, water availability and the inclination of

TABLE 4.2

Statement Showing the crop wise normal areas and area sown in Warangal districts

(Area in Hectares)

Crops	1985-86			1986-87			1987-88			
	Kharif	Rabi	Total	Kharif	Rabi	Total	Kharif	Rabi	Total	hect.
1. Rice	104514	11731	116245	104182	17083	121265	129127	37244	166371	"
2. Jowar	32982	53640	86622	34071	43813	77884	38383	57602	95985	"
3. Bajra	14310	11	14321	11280	9	11289	9330	—	9330	"
4. Maize	19326	9179	28505	26803	8736	35539	23455	9743	33198	"
5. Green gram	75455	—	75455	76783	—	76783	85898	—	85898	"
6. Red gram	7073	102	7175	2485	—	2485	2634	—	2634	"
7. Ground nut	25911	30710	56631	33481	31252	64733	30818	47396	78214	"
8. Sesamum	20717	303	21020	19744	367	20111	23599	410	24009	"
9. Castor	8183	326	8509	9971	140	10111	12385	180	12565	"
10. Sunflower	—	—	—	—	—	—	—	—	—	"
11. Chillies	8502	7476	15738	15119	7228	22347	6371	7360	13731	"
12. Cotton	—	—	—	31540	1252	32792	32823	—	32823	"
13. Tobacco	229	870	1079	—	—	—	562	—	562	"
14. Turmeric	—	—	—	—	—	—	—	—	—	"

Crops	1988-89			1989-90			1990-91			hect.
	Kharif	Rabi	Total	Kharif	Rabi	Total	Kharif	Rabi	Total	
1. Rice	135255	43713	180968	140660	43941	184601	137323	48366	185689	〃
2. Jowar	20653	30857	51510	18973	24771	43744	13238	21966	35202	〃
3. Bajra	5702	94	5796	3020	42	3062	2505	76	2581	〃
4. Maize	15608	8789	24397	13572	8344	21916	18326	8778	27104	〃
5. Green gram	76008	14	76022	66299	26	66325	66737	88	66825	〃
6. Red gram	9506	61	9567	8644	112	8756	9940	599	10539	〃
7. Ground nut	45867	46197	92064	45098	43821	88919	49369	52465	101834	〃
8. Sesamum	27632	356	28188	23244	514	23758	19934	803	20737	〃
9. Castor	9101	227	9328	8276	1119	9395	9616	330	9946	〃
10. Sunflower	—	—	—	—	—	—	—	—	—	〃
11. Chillies	14290	9965	24255	23131	10556	33687	21408	8602	30010	〃
12. Cotton	28173	51	28224	32202	25	32227	27842	319	28161	〃
13. Tobacco	334	696	1030	649	801	1450	—	—	—	〃
14. Turmeric	—	—	—	—	—	—	—	—	—	〃

Crops	1991-92			1992-93			hectares
	Kharif	Rabi	Total	Kharif	Rabi	Total	
1. Rice	131652	24247	155899	94899	13666	108565	〃
2. Jowar	7554	16714	24268	5588	25208	30796	〃
3. Bajra	1128	85	1213	702	121	823	〃
4. Maize	19755	9550	29305	22620	8778	31398	〃
5. Green gram	67068	32	67100	60782	39	60821	〃
6. Red gram	8378	311	8689	7485	408	7893	〃
7. Ground nut	47493	50583	98076	40843	37423	78266	〃
8. Sesamum	19578	484	20062	20974	291	21265	〃
9. Castor	8142	50	8192	4905	91	4996	〃
10. Sunflower	—	—	—	—	—	—	〃
11. Chillies	20291	9662	29953	25677	7988	33665	〃
12. Cotton	33626	50	33676	29494	144	29638	〃
13. Tobacco	1173	917	2090	1817	725	2542	〃
14. Turmeric	—	—	—	—	—	—	〃

Crops	1993-94			1994-95			hectares
	Kharif	Rabi	Total	Kharif	Rabi	Total	
1. Rice	76294	16555	92849	99657	31600	131257	〃
2. Jowar	5439	33367	38806	4927	26823	31750	〃
3. Bajra	1189	—	1189	819	—	819	〃
4. Maize	20843	6031	26874	20239	9200	29439	〃
5. Green gram	52144	—	52144	53330	—	53330	〃
6. Red gram	6888	—	6888	6567	700	7267	〃
7. Ground nut	36353	45558	81911	36270	44000	80270	〃
8. Sesamum	23688	—	23688	26993	27	27020	〃
9. Castor	1580	—	1580	3884	120	4004	〃
10. Sunflower	121	12433	12554	1104	14000	15104	〃
11. Chillies	19565	9920	29485	15811	10454	26265	〃
12. Cotton	53357	938	54295	69286	—	69286	〃
13. Tobacco	1580	293	1873	160	20	180	〃
14. Turmeric	—	—	—	7772	—	7772	〃

		1994-95				1995-96				
		Kharif		RAbi		Kharif		RAbi		
	Crops	Normal	Actual	Normal	Actual	Normal	Actual	Normal	Actual	Hectares
1.	Rice	119285	99657	30774	31600	111618	90630	29393	29790	″
2.	Jowar	10247	4927	25132	26823	7338	2563	25905	24000	″
3.	Bajra	1714	819	—	—	1310467	77	28		″
4.	Maize	19691	20239	8664	9200	21163	20837	8584	10200	″
5.	Green gram	64491	53330	—	—	62263	47126	50	487	″
6.	Red gram	8506	6567	—	700	8356	6606	—	—	″
7.	Horse gram	—	—	1696	909	—	—	1794	2156	″
8.	Black gram	—	—	176	—	—	—	154	862	″
9.	Bengal gram	—	—	788	638	—	—	759	573	″
10.	Ground nut	44998	36270	46284	44000	43349	31329	46024	46000	″
11.	Sesamum	22230	26993	514	27	23189	21786	475	340	″
12.	Castor	7360	3884	375	120	6331	3552	—	—	″
13.	Sunflower	911	1104	7411	14000	1038	435	11004	15500	″
14.	Chillies	22780	15811	9088	10454	22425	18717	8903	9735	″
15.	Cotton	57544	69286	—	—	60719	77528	107	2730	″
16.	Tobacco	1208	160	717	20	—	96	554	36	″
17.	Turmeric	4819	7722	—	—	6084	5497	—	—	″
Grand Total		**385783**	**346280**	**131619**	**138491**	**375183**	**327169**	**133783**	**142437**	**hectares**

		1996-97				1997-98				
		Kharif		RAbi		Kharif		RAbi		
	Crops	Normal	Actual	Normal	Actual	Normal	Actual	Normal	Actual	Hectares
1.	Rice	102645	120712	27957	41387	102054	16574	32866	1118	″
2.	Jowar	5148	2356	25986	24950	4065	2796	26183	12263	″
3.	Bajra	906	338	64	62	720	338	48	—	″
4.	Maize	22115	22317	8694	9050	23052	19961	8957	13917	″
5.	Green gram	57846	43051	37	154	53236	19689	54	192	″
6.	Red gram	7616	8810	—	215	7997	12266	351	7640	″
7.	Horse gram	—		2059	2156	36	26	2086	1115	″
8.	Black gram	—	150	143	2092	—	—	191	2029	″
9.	Bengal gram	—	—	791	764	—	—	791	497	″
10.	Ground nut	40021	34308	43948	43575	37344	17838	40799	23819	″
11.	Sesamum	24099	22945	362	—	25298	11901	337	55	″
12.	Castor	5329	4435	—	—	4715	3839	—	—	″
13.	Sunflower	1088	150	13827	10950	1025	150	14553	14765	″
14.	Chillies	22635	17792	9232	6550	23505	9482	9474	12283	″
15.	Cotton	66710	100646	—	—	77073	99150	40	—	″
16.	Tobacco	—	—	—	—	—	—	271	—	″
17.	Turmeric	6646	5395	—	—	7285	4846	—	—	″
Grand Total		**362499**	**383405**	**133102**	**122562**	**367369**	**207856**	**136730**	**89693**	**hectares**

Source: *Office of the Joint Director of Agriculture, Warangal, Andhra Pradesh.*

farmers. As a result of the aggressive marketing by private companies the farmers committed their first mistake, according to Dr. L. Jalpathi Rao, a senior agronomist in the Warangal Agriculture Research Centre, by abandoning the short-duration variety of cotton suitable for the low rainfall and shallow soil of Telengana. They planted RCH-2, a long duration variety, suitable to areas with assured irrigation. The drought condition in the beginning and the erratic power supply compounded the problem of poor irrigation.

In 1994-95 the total area under cotton cultivation in Warangal was 69286 hectares which increased to 100646 hectares in 1996-97. Commensurate to the increase in acreage was the increase in cotton arrival in the Warangal cotton market. In 1994-95 the total arrival of cotton was 6,76,993 quintals which increased to 13,38,330 quintals in 1996-97. The increase in cotton production led to the decline in its prices. In 1994-95, the average price per quintal of cotton was Rs. 1809/-, which went down to Rs. 1618/- in 1996-97 (see Table 4.4). However, there was no decline in the input cost per acre, instead the input cost in cotton has been increasing every year, says Dr. Jalpathi Rao.

In Warangal district the cotton crop basically replaced the crop rotation based on jawar (Rabi) and green gram (Kharif). Now these two crops have been almost finished. The acreage under the green gram - jawar sequence has shown a drastic decline in last one decade. In 1987-88 the area under the green gram and jawar sequence was 143500 hectares which declined to 31952 hectares in 1997-98. Besides jawar and green gram, cotton has also replaced other oil seeds especially sesame, groundnut and castor. Today cotton is grown in 20-23% of the total cultivable area in Warangal. The total agricultural land of Warangal is around 4.5 lakh hectares, according to Dr. Jalpathi Rao.

In 1997-98 the total area under kharif cotton was 99,150 hectares. 80% of cotton farmers used RCH - 2 (Research Cotton Hybrid- 2) apart from the other varieties used by the farmers were Somnath and Shaktinath of Nath seeds, MECH - 1, 12 and 13 of Mahyco Seeds, Sunjiv of Indo-American Seeds. RCH -2 has been the most vulnerable variety to pest attack. One of the reasons for the more severe pest attack on RCH-2 was due to the compact planting or bushy

TABLE 4.3

Acreage under different varieties of cotton in Warangal: 1996 - 97

	Variety	***Hectares***	***Cost of 450 grams***	***packet***
1.	RCH-2	60,080 hec.	Rs. 250/=	- Rs. 300/=
2.	H - 4	2,500 "	Rs. 260/=	- Rs. 300/=
3.	NH - 44	4,100 "	Rs. 250/=	
4.	JKHY - 1	3,800 "	Rs. 250/=	
5.	MAHYCO	8,100 "	Rs. 250/=	- Rs. 350/=
6.	Nath	8,200 "	Rs. 250/=	- Rs. 350/=
7.	Vanapamula	4,800 "	Rs. 250/=	- Rs. 300/=
8.	Others	9,066 "	Rs. 250/=	- Rs. 350/=
	Total	**100,646 hec.**		

Source: *Office of the Joint Director of Agriculture, Warangal, 1997.*

TABLE 4.4

Cotton Arrival and Prices in the Warangal Agriculture Market

Year	***Arrival***	***Price per qtl.****
1985-86	1,77,929 qtls.	Rs. 437/-
1986-87	1,62,332 "	Rs. 585/-
1987-88	6,08,592 "	Rs. 793/-
1988-89	5,10,296 "	Rs. 786/-
1989-90	5,64,290 "	Rs. 761/-
1990-91	4,32,364 "	Rs. 785/-
1991-92	3,73,430 "	Rs. 1233/-
1992-93	5,72,643 "	Rs. 1040/-
1993-94	7,72,999 "	Rs. 1257/-
1994-95	6,76,993 "	Rs. 1809/-
1995-96	11,35,972 "	Rs. 1742/-
1996-97	13,38,330 "	Rs. 1618/-
1997-98	8,33,000 "	Rs. 1800/-

* Annual Average Rate per quintal.

Source: *Cotton Cooperative Office, Warangal*

planting of this variety. This variety grows horizontally and it has a closed canopy, which protects pests due to non availability of sunrays beneath the canopy.

In one acre, 450 grams of seeds (of any cotton variety) are sown. The cost is between Rs. 250-Rs. 350/= per 450 grams' packet. However, when the farmer finds that all seeds have not germinated he again sow seeds at that point. So, about 500-600 grams of seeds are used in one acre. Since RCH-2 was very popular, the farmers had to book this variety in advance and those who did not book the seeds, had to buy it by paying higher prices in the black market.

However, the cotton failed due to severe pest attack. The frequent sprays and spurious quality of pesticides used, made them even more ineffective. Most farmers had to spend between Rs 12,000 to Rs 15,000 an acre on pesticides. The heavy investment made in purchase of agri-chemicals could not be recovered because the yield was much below the expected level and it even did not cover the input cost. The small farmers who had taken money and material on credit were driven into debt and then to suicide.

The agricultural season of 1998-99 in the state of Andhra Pradesh echoed the experience of the preceding years. Facing incessant rains followed by drought, working hard for the whole year and not getting the reasonable price for the produce, unable to pay back the loan obtained from private moneylenders, farmers have been succumbing to suicides. Within Andhra Pradesh, more than 80 percent of total farmers suicides occurred in the Telangana region of the state alone, and Warangal district shares 40 percent of total deaths in Andhra Pradesh.

Farmers, lured by the good features of advertisements screened on varieties of cotton seeds of few companies in their villages, cultivated their lands with new varieties of cotton namely Navratan, Ajith, Parry White Gold, Bioseed etc. Keeping in mind the losses incurred during the past cotton crop, cotton has been cultivated with utmost care. In spite of that, the adulterated seeds have destroyed thousands of acres of cotton crop in Parakala, Regonda, Atmakuru, Geisukonda, Sangyam, Dharmasagar mandals of the district.

In Warangal district, during 1998-99, the extent of area cultivated by Navratan, Ajith, Parry White Gold, Bioseed etc varieties of cotton was around thirty thousand acres, which was spread across two hundred villages in twenty-seven mandals. It is believed that about six seed companies were successful in introducing these varieties in the villages through their field distributors.

Interestingly, the seed companies select their seed distributors from the village itself. These distributors are found to be the large farmers who were well off and influence decision making for number of villagers. The films shown by the seed companies to the farmers have been found to have great impact in their decision making about what type of seed to go for. Many of the farmers were reporting that the boll size and the opened boll were very good in the films. However they could not get a single boll so far in their fields, and whatever bolls formed were shed by the plant without opening.

In village Ulligedda Damera, Atmakuru mandal of Warangal District, the whole village had planted a total extent of 150 acres with Navratan Ajith variety of cotton in 1998-99. Madarappu Ramesh, who had cultivated Navratan Ajith, informs that he had invested a total of Rs 10,000 to Rs 11,000 per acre on his

cotton crop. Of this investment nearly 70 percent was spent on the chemicals and fertilisers. In the same village another farmer, Gudur Rajaiah had cultivated 3 acres of land with Navratan Ajith variety and admits that he also incurred the same cost of cultivation for the cotton crop. His situation was worse as compared to Ramesh as he had a debt of Rs 90,000 from the *arthies* or private moneylenders at an interest rate of 36 to 48 per cent. All of them came to know about this variety of seed from video film showed to them in their village. And almost all the farmers were under debt either to the Arthies shops or to the landowners.

In another village Pallarigudda in Sangyam mandal of Warangal district, almost all the farmers had cultivated their fields with Parry White Gold ('PWG'). The standing crop was very robust but without any bolls on the plants. About 150 villagers had moved their papers in the district consumer redressal forum at Warangal against the failure of PWG and demanded appropriate compensation for them by the company. The Government officials also visited the fields of farmers whose cotton crops were failed. The villagers also requested the government officials to do the needful so as to clear their spiralling debts.

> B Ramanamma belongs to Gangapur village in Jadcherla in Mehboobnagar District of Andhra Pradesh. She and her husband cultivated 20 acres of leased land. Taken in by the marketing hype of seed companies, they replaced paddy with cotton. This proved beneficial at the beginning, but demanded intensive irrigation, for which they took a loan of Rs. 50,000. The subsequent crops failed. Burdened with loans and accumulating interests Ramanamma's husband consumed pesticide and committed suicide. Ramanamma and her son are today working as construction workers in order to survive.

Lack of Agricultural Extension Workers Support

In addition to the seed failure, in many mandals yellow-insect pest of cotton had destroyed the entire standing crops in 1998-99. The farmers reported that the agriculture department of the state shown total negligence in disseminating the advice of scientists and hence it resulted in the havoc caused by the pest. Added to this, the farmers persuaded by the suggestions given by the pesticide shopkeepers had used inferior chemicals with high cost, which could not reduce the pests attack on the cotton crop. Also the rate for cotton per quintal was not more than Rs 1500/- which was not commensurate with the investment made on the crop.

Getting disappointed over the losses incurred over the investment and the inability to feed their families, the farmers are consuming pesticide mixed in their curd rice and committing suicide. The number of suicides reported during November and December in 1998 was about 15 farmers. These suicides were mainly due to the debts that got accumulated over the few cropping seasons. Of these suicides majority of the farmers were in the age group of forty years and above. The deceased farmers left behind them families who have no one to look after them. The story of two farmers who committed suicides is given in the Box.

Through discussions with various seed and pesticide merchants at Warangal, it was revealed that the seed companies provide a very high margin on their products and also they do not demand immediate payment through cash from the pesticide merchants. About 80 percent of the transactions are on credit basis. They get nearly 45 to 60 days of credit. The merchants pay the seed companies through post dated cheques. In turn the merchant sells the product on credit to the farmers who get lured by the helping hand extended by these

merchants. Since the farmers need not pay the amount in cash they get trapped by the seed merchants and debt on the farmer increases. Also the same merchant sell the chemicals and fertilisers required for the crops. Getting everything under one roof and that too without paying cash and in credit makes the farmer listen to every suggestion given by the merchant. In this way the farmer sinks in the marsh of indebtedness and gets spiraled in the loans.

Various seed and chemical companies that are operational in Warangal are Shaw Wallace, ICI, Rallis India, Monsanto, Saral India, Novratis, Nocil, Bayer. The liberalisation of seed sector is an epidemic leading to suicides and high debt for purchase of seeds, agri-chemicals and pesticides.

Growing Seed Scarcity

Globalisation and privatisation of the seed sector have eroded farmers seed supply and seed supplied by the public sector. While the entry of private seed companies is justified on grounds of increasing farmers options and choices, by making farmers look down on their own varieties as inferior and by eroding the capacity of the public sector, globalisation has in effect created a seed famine.

There is a great mismatch in the seed demanded by the farmers and the seeds supplied. With widening gap between the demand and supply, the plight of the farmers is getting worse. The demand for the seeds of all crops has nearly doubled within a time span of six years. Of the total requirement of seeds in Andhra Pradesh the Public Sector Agricultural Departments, State Seed Development Departments and Oil-fed supply around 20 percent of the demand. Taking advantage of the deficit supply of seeds, private sector seed companies are entering into supply of spurious seeds.

Non-availability of seeds is also creating conditions of distress and instances are surfacing where farmers are resorting, again in this situation of seed scarcity, to committing suicides. For instance, in the Rayalseema region of Andhra Pradesh, 50 lakh acres of groundnuts is cultivated. It is known to the farmers that the groundnut crop in the kharif season can withstand for 10 to 15 days without any rains. This peculiarity of groundnut has been utilised by Anantpur and Kurnool regions and cultivate this crop. Anantpur district itself requires 14 lakh quintals of groundnut seeds. The government supplied only 1.12 lakh quintals of the seeds. On further agitation by the farmers, the government could further provide 68,000 quintals, totaling all together a meager 12 percent of the requirement.

Case Studies of two farmers

Kottula Yakayya, Village Samudrala

Kottula Yakayya of village Samudrala in Staton Ghanpur Mandal committed suicide in 1999. His family owns 4 acres of land. On 2 acres of land chilies were sown and remaining two acres cotton was grown. Last year for cultivating cotton he burrowed a sum of Rs 25,000/- on loan basis. With interest it totaled to Rs 60,000/-. Money-lenders started pestering him for payment of their interest. Not getting proper price for the cotton in market and unable to know how to clear the heavy debt, the farmer got agitated and consumed insecticide and committed suicide.

Pacchikayala Kameswara Rao, Village Akinepalli

Pacchikeyala Kameshwara Rao of Akinepalli village of Mangapeta Mandal, unable to bear the financial problems committed suicide same year. Insects intensely attacked the cotton crop cultivated by him. Use of many insecticides could not stop the spread of insects. Due to this the crop got completely destroyed. Due to lack of advice from the scientists and agricultural officers he got completely disillusioned and consumed poison in the form of insecticides and committed suicide.

There are many more cases of suicide where the lack of scientific advice by the concerned agricultural departments led to suicides of Indala Ayilayya, Malotu Danja, Tallapalli Lakshamayya, Pentala Odelu.

Thus, public sector seed companies are unable to meet the demand and are backing every year. Taking advantage of the situation and also governments privatisation spree, the private seed companies are trying to reap benefits through unreliable seeds.

In the absence of non-availability of seeds, the farmers either leave their lands fallow or are forced to change to other crops. Gogoti Bali Reddy, from Kuntalapalli village in Nallamada mandal, in Ananthpur district succumbed to suicide due to the situation arising out of non-availability of seeds to sow.

In the agricultural season of 1999 – 2000, five lakh acres of rich fertile land has been left fallow without any crop. The scenario is same everywhere. In the ghat region (basically tribals), the farmers were not able to raise their paddy nurseries due to lack of paddy seeds. Similarly, the subsidy available on seeds has been removed. During the cropping season of 2000 – 01, the Department of Agriculture, unearthed a racket operating in distribution and sale of spurious *banni* cotton seeds. The farmers have so far planted 50,000 acres of land with *banni* seed in the districts of Guntur and Prakasham.

Another aspect, which has been the result of seed scarcity, is the shooting up of the seed prices. The cottonseeds are now sold at double the price of the period of easy availability. This appears to be deliberate, so as to create market for the genetically engineered *Bt* cotton which will be relatively higher priced.

Seeds, Pesticides and Debt: The intimate nexus of Corporate Feudalism

In Warangal, land is easily available on lease because of the heavy migration of people from the villages to the city. The farmers with small land holdings often take land on lease to grow cotton. Those who take land on lease have to pay Rs. 1800 - 3000 as annual rents. Rajmalla Reddy of Atmakur Mandal has 40 acres of land of his own. Out of 40 acres, 35 acres he gives on lease every year and get Rs. 1800 per annum as rent for one acre. Those lands that have irrigation facility fetch up to Rs. 3000 per annum said Mr. Reddy. Attracted by the prospect of getting rich overnight, peasants who lease land spend thousands of rupees on buying pesticides and fertilisers that were necessary for the conventional cotton cultivation. Besides putting their own resources, the middle and small farmers borrow money, paying high interest rates, from "*arthies*" or private moneylenders who also provide them seeds, fertilisers and pesticides on credit. The private moneylenders took on the role of "pest management advisers", extended credits to farmers, sold spurious pesticides made by fly by night companies, charged higher prices than prevailing prices for them, and recommended the application of excessive doses of these pesticides.

TABLE 4.5
Andhra Pradesh State Requirement of Seeds

Year	*Seeds Requirement (Quintals)*
1994 - 95	9,55,892
1995 - 96	9,85,822
1996 - 97	10,16,720
1997 - 98	11,33,205
1998 - 99	13,78,489
1999 - 2000	17,56,300

The rise of moneylenders is a part of an emerging phenomenon of corporate feudalism. Withdrawal of low interest credit has been a key element of the World Bank led economic reforms. As cooperatives and rural banks close down, and public sector banks are privatised, rural credit dries up and farmers are pushed into borrowing from moneylenders. The failure of the private sector in Indian banking was what had ushered in the nationalisation of banks in the

Andhra Groundnut crop failure drives farmers to suicide

Hyderabad, September 24.

Close on the heels of suicdes by Mehboobnagar cotton farmers during April-May this year, death has once again begun to take a heavy toll in the fields of Anantaput distrcit, bordering Karnataka. AS many as seven farmers and two girls have committed suicide in the districts during the last four days due to pest attack that almost wiped out the entire groundnut crop in 3 lakh acres.

The Hindustan Times, New Delhi, 25.09.2000

1966. The per-nationalisation period had witnessed the growth of a banking system, which driven by profits could not cater the development needs of the nation with the virtual inaccessibility to credit for the large masses of the rural and poor population. Lending policies were turned to the advantage of industrialists with banks being under the control of industrial chairmen. Banking came to be controlled by a few communities making it a family profession. The nationalisation of banks was followed by a sharp increase in the number of bank branches. Consequently employment shot up. Further, banking policies were tuned more to cater to the development needs of the nation as priority sector lending took headway over profit driven lending. Protecting the poor from the clutches of unscrupulous money lenders, the nationalisation of banks had succeeded in building up the productive base of regions and areas which would have otherwise remained neglected, through a number of projects and programmes targeted particularly at women and other weaker sections of society.

The opening up of the banking sector to competition from domestic private and foreign banks has been accompanied by a reversal in the above trends. For instance, there has been a fall in the proportion of credit received by the household sector, which had earlier received relatively larger share of bank credit. Further, the incremental expansion during the post-reform period for the household sector has not only been the smallest during the post reform period but also smaller than the expansion in favour of corporate enterprises. Similarly, the financial assistance sanctioned by the all-India financial institutions suggests that while disbursements of Development Financial Institutions (DFIs) generally assisting large scale industries expanded by 197 per cent between 1990-91 and 1994-95, those of DFIs assisting small scale and medium industries have risen by 62 per cent only (Shetty, Alternative Economic Survey, 1996).

The area and group wise classification of banks shows the concentration of foreign banks in metropolitan areas and a complete absence of foreign banks in the rural areas, while private banks are mostly concentrated in the semi-urban areas. In the event of the nationalised banks giving way to private participants, it wouldn't be long before the rural areas are isolated from the financial scene. These trends are but suggestive of a return to the pre-nationalisation era that had doomed to be a failure.

The private moneylenders are mostly pesticide dealers or shop owners. In Warangal there are 13000 pesticide shops which distribute pesticides produced by 93 companies which are registered in Andhra Pradesh and also by about 200 contraband units based in Maharashtra (Asish Chakrabarti, Feb 1998). In each village there are 5-8 shops. The shop owners and dealers get their supply of the stock from the pesticide companies on credit. So there exists a chain of credit system, and the shop owners are only the mediators. In reality the farmers indirectly get the credit from the company itself. The interest rate varies from 36 to 60 percent per annum. Since the chemicals are easily available on

credit, the farmers have no hesitation in using it at short intervals, usually once a week and at a higher intensity. There is no government agency to finance the farmers and bank loans are negligible. This has forced farmers to approach the private moneylenders.

The cotton farmers in Warangal spend about Rs. 1500/= on preparing the field (esp. on labour). The sowing period is June - July. In fields that are rainfed, sowing is delayed till it rains. One week to 10 days after sowing the cotton seeds farmers do the first spray of pesticides. This is done without ascertaining the existence of pest in their field. The first spray is considered to be very crucial and it is believed that if the first spray is missed, the crop will fail. However, the State Government's Agriculture Department and the Agricultural Research Station, Warangal, have suggested the Integrated Pest Management (IPM) strategy to the farmers to control the pests through growing "trap crop" e.g. castor, marigold and pheromone trap in the field to see whether pests exist or not.

But farmers brainwashed into the miracle seeds - miracle spray culture do not pay heed to these suggestions, and within 10 days of sowing, they start spraying their cotton fields with pesticides. Initially they use lower concentration of chemicals. The chemicals that are used in the initial stage of spraying are Monocrotophos 36% EC, Dymethet 30%, Oxydemeton Methyl etc. Mixing of two chemicals is very common. In the first spray only 250 ml technical is used in one acre of land. But from the 2nd spray onwards 50 ml is added and at one stage they end up using one liter of chemicals per acre. In one season, besides expenditure on fertilisers, labour and seeds, the cotton farmers spend Rs. 8,000 to 10,000 on pesticides alone. Pesticide is a major input in cotton. Once a week 300 ml. to 500 ml. of pesticide are sprayed per acre and in one season (June-March) 25-35 sprays of pesticide is a normal practice in Warangal.

Among all the Indian states, the maximum use of pesticides is in Andhra Pradesh. A major portion of this is used in cotton and chilli cultivation. Cotton is quite susceptible to a range of pests and diseases. In 1980s pesticides consumption in Warangal was less than Rs. 10 crores. But as the hybrid cotton cultivation picked up its momentum in 1985-86 pesticides use also increased. In 1997 - 1998 the approximate sale of pesticides in Warangal district alone is Rs. 200 crores (Asish Chakrabarti, Feb. 1998), which is the highest in Andhra Pradesh, and near about 80% of this is used in cotton.

The pest problem is not new in the Telangana region; the farmers of this area have been facing this problem for the last three years. But in 1997-98 the problem was very severe and the pests attacked almost all standing crops in the fields. However, the most affected crop was cotton. Unlike the last three years, there was a heavy loss of crops in 1997-98. The cotton farmers were more affected because input cost in cotton was higher and the yield was not as expected.

Earlier the cotton farmers used to get 10-12 quintals of yield in one acre spread over four to five picking. But 1997-98 they could hardly get 4-5 quintals. Some of the farmers could not get even that. The temptation of heavy returns on cotton had attracted the small farmers who had even leased land for growing cotton. Bandi Kalavathi, w/o. Somaiah of the Venkatapur village, had no land of her own but she had taken 5 acres of land on lease and in 4 acres she had planted only cotton. She had taken Rs. 35,000 as debt from private parties.

Bandi Kalavathi is one of the farmers who committed suicide due to the crop failure.

In the cotton cropping season in 1997-98 not a day passed since mid-December 1997 without at least one farmer ending his life as a consequence of the failure of the cotton, chilli, red gram and other crops in Warangal, Karimnager, Medak, Rangareddi and Mahabubnagar districts in the Telangana region and Kurnoor in the Rayalaseema region.

Incidentally, this was not the first time that such suicides have taken place in Andhra Pradesh. In 1987, in the Guntur and Prakasham areas, the cotton farmers faced a similar predicament followed by tobacco farmers in other areas in subsequent years. Farmers were encouraged to shift from their traditional self-sufficient cropping (of paddy and vegetables) to more remunerative cash crops. But unlike their traditional food crops, total reliance on cash crops entailed a gamble, since fluctuations in the market price affected their earnings. Besides, their cultivation involved huge expenditure on inputs like fertilisers and pesticides.

For the pesticides industry, the pests are a blessing in disguise. It has over the years sustained the profit margins of the pesticide manufacturers and traders irrespective of the extent of crop damage. The more the pest incidence the more lethal is the pesticide cocktail. Consequently, the insects became resistant to all kinds of pesticides. Today the controversial synthetic pyrethroids are also available in the market. The pyrethroids are more expensive and are known to have a knockdown effect on insects, birds, and animals and are also believed to be carcinogenic. No sooner did the pesticides trade push in the pyrethroids, the insects also developed immunity against these fourth generation pesticides.

There are 28 known natural enemies of pests in the cotton fields. Nature has provided enough protection for cotton through the abundance of benign insects, parasites and predators available in the field, for example spider, lady-bird beetle, crysopa, wasp, rats, frogs, snakes and birds etc. But the tragedy is that it is these parasites and predators that first get killed when pesticides are sprayed. Bereft of its natural enemies the pest appears stronger in the crop field. In Warangal the indiscriminate use of pesticides have reduced the population of birds in this area. When the pesticides disturb Nature's equilibrium, many of the little known and insignificant pests of cotton, like the white fly and spodoptera, emerge as major pests.

There are more than 50 chemicals (technical) used in agriculture and more than 90 companies are selling their products in Warangal district. There are several companies that are selling spurious and low quality chemicals that has developed pest resistance. As a result, farmers used higher concentrations and more expensive pesticides. Mixing of two-three chemicals in order to combat the pest has become a normal practice.

Besides pesticides, the cotton farmers also use fertilisers. In one season, about 150 kg of fertilisers, which cost about Rs. 1500 – Rs. 2000, are used in one acre. Every cotton farmer uses DAP and Urea. Besides Urea, they either use 17-17-17, 28-28-0, 14-35-14, 16-20-0-15, Ammonia, DAP etc.

The two pests that attacked the cotton crop in 1997-98 in Warangal were "*Heliothis*" and "*Spodoptera*". Before these pests attacked cotton, the sucking and chewing pest, i.e. white fly had attacked groundnut and chilies. In October

- November, *Spodoptera* attacked the cotton crop. Though this is not a major pest for cotton, but it heavily attacked cotton besides groundnut, chilies, pulses etc. The *Spodoptera* eats everything that is green - leaf, buds, flowers, and capsules. It is a voracious eater and moves in-groups attacking one field after another. *Heliothis,* on the one hand, only eats cotton capsules and buds. From morning to evening it remains under the soil and comes up in the evening for eating. That is the reason pesticides spray doesn't affect them. In 1997-98 the farmers had to use poison baits to kill this pest.

Consequences of Overburdening Debts: Distress Sale of Kidneys

The ever growing interest rates and the accumulating debts in Rentichintala Mandal of Andhra Pradesh has led to distress sale of kidneys by many farmers. The farmer are caught in loose - loose situation and there is no way out either for getting rid of the debts or getting humiliated at the hands of *'arthies'* and money lenders/ *pawn* brokers.

The farmers here switched to cultivating chilli, as usual, driven by the lucrative returns. The investment during initial years were very less as they were using native seeds which are known for less chemical intakes. However with the monoculture of chilli cultivation spreading the damage through disease attacks increased and every year the standing crops were affected.

The loan which was subsequently taken after a failed crop each year was utilised by the farmers to sustain themselves and with whatever left amount to carry for the next cropping season. Farmers got the support of *pawn* brokers to get money in order to buy the necessary chemicals and sprays. The *pawn* broker is the major actor who is always in win – win situation in dealing with the farmers. He supports the farmer by providing loans at very exorbitant interest rates and also imposes chemicals on them from his shop. The small loans got accumulated over years and the farmers found themselves in heavy debts.

Once farmers are deep in debt there is no alternative available, but sell off their land, agriculture implements or the house in which they live. Of late some farmers in Rentichintala and surrounding areas like Gurazala, have sold their kidneys in order to clear their outstanding debts with the *pawn* brokers.

The farmers who sold their kidneys from Rentichintala Mandal are:

1. Durgyampudi Chinna Venkat Reddy
2. Dirsinals Narsi Reddy

A. P. Farmers Sell Kidneys to avoid Penury

Guntur, May 15.

Rentachintala, once again the hottest place in Andhra Pradesh, is back in the news, for an altogether different reason. At least 26 persons, all in their prime age, have sold their kidneys for pecuniary gains.

Pushed into the clutches of penury, the handful of small time farmers found an easy way out from their debt trap at the cost of their kidneys. The gravity of the situation can be gauged from the fact that at least 100 persons underwent fitness tests.

A "seller" Mr. Polli Reddy said he had no other option. "We owe thousands of rupees to the money lenders. They gave us loans to raise crops, mostly cotton and chillies. We could not reap a good crop in thelst two years. The growing interest was draining our pockets."

The Hindu, New Delhi – 16. 5. 2000

Bobba Venkat Reddy got deeper and deeper into debt as spurious seeds and chemicals ruined his crops year after year. Continuously harrassed by money lenders, he heard of a broker who was helping farmers get money by selling their kidneys. For Venkata Reddy, this was a better option than suicide, and he availed of it. However, the surgery has left him weak and unable to work his farm. Because of the media coverage, money lenders have refused to loan any more money to him and other farmers like him.

3. Bobba Venkat Reddy
4. Siddhavarpu Poli Reddy
5. Peram lacchi Reddy
6. Kancharla Krishna
7. Narmala Krishna
8. Golle Ramaswami
9. Thai Narsaiah

After the incident of kidney sale by farmers came to the knowledge of everyone, the life of these farmers has become even worse. There is no support either from the government or from the village itself. These farmers are looked after as untouchables and no one is coming forward to extend support to the deprived families.

2. The Karnataka Scenario on Farmers' Suicides

Agriculture Scenario in Karnataka

Agriculture plays an important role in the economy of Karnataka, contributing about 28 per cent of the gross domestic products. More than 67 per cent of population is engaged in agriculture. Kharif is the major season of crops and it contributes to about 70 per cent of agricultural production, and balance of 30 per cent comes from the Rabi season. Areas under irrigation are around 24 per cent of the total cultivated area, and thus about 76 per cent of the production depends on rainfed agriculture. But, even if the rainfall is normal, the distribution is very erratic and uneven in most parts of Karnataka. During Kharif 2001-02, the monsoon was very erratic and unevenly distributed with as many as 119 taluks having dry spells for 7 to 12 weeks out of total 17 weeks.

Likewise, the rainfall was erratic during 2003. While there was drought in major parts of the state, there was heavy rainfall in the month of October causing floods.

Cropped Area, Production and Productivity Trends

Over the past 5-6 years, there had been a considerable decrease in area under oilseeds, particularly in the case of sunflower. Among cereals, maize is grown in larger area during Kharif in place of Jowar. Total foodgrain production, which was in the range of 60 to 70 lakhs tonnes, increased up to 100 lakh tonnes during the '90s. Foodgrain production, which was 92.13 lakh tonnes in 1996-97, increased to 109.49 lakh tonnes during 2000-01 showing a rise of 18.84 per cent. Sugarcane production has also increased considerably due to expansion in area under cultivation. Yield of cereals, pulses and sugarcane has increased considerably. These facts do not show any sudden reduction in production or productivity of crops during the 2000-01 (table 4.6).

TABLE 4.6

Area, Production and Yield of Principal Crops in Karnataka

Crop/Crop Group	*1996-97*	*1997-98*	*1998-99*	*1999-00*	*2000-01*
Cereals: Area in lakh hectares	55.95	53.79	55.96	57.45	57.29
Production in lakh tonnes	84.91	75.40	92.50	90.11	99.79
Yield in Kgs Per hectares	1597	1476	1740	1651	1830
Pulses: Area in lakh hectares	17.76	16.82	18.20	19.20	20.61
Production in lakh tonnes	7.22	4.96	7.47	8.48	9.70
Yield in Kgs Per hectares	428	311	432	465	495
Total Foodgrains: Area in lakh hectares	73.71	70.60	74.16	76.66	77.90
Production in lakh tonnes	92.13	80.37	99.97	98.59	109.49
Yield in Kgs Per hectares	1316	1198	1419	1354	1477
Oilseeds: Area in lakh hectares	26.06	23.72	24.37	19.82	18.89
Production in lakh tonnes	17.55	11.39	16.71	11.93	15.09
Yield in Kgs Per hectares	709	506	722	633	839
Cotton: Area in lakh hectares	6.60	5.02	6.36	5.46	5.60
Production in lakh bales of lint	10.09	6.34	9.77	6.65	9.80
Yield in Kgs Per hectares	274	226	275	218	313
Sugarcane: Area in lakh hectares	2.82	3.09	3.39	3.73	4.21
Production in lakh tonnes	233.74	289.99	347.71	375.67	432.48
Yield in Kgs Per hectares	87	99	108	106	108
Tobacco: Area in lakh hectares	0.70	0.71	0.84	0.75	0.70
Production in lakh tonnes	0.57	0.62	0.59	0.45	0.54
Yield in Kgs Per hectares	854	925	742	622	804

(Veeresh 2002)

Land Holding and Assets

Our study has shown that largely victims are concentrated in 1 to 3 acres of farm groups, but there are cases where the size of holding is more than 10 acres. A large number of victims held only rainfed lands, but the victims in districts like Mandya are having substantial irrigated land. Having protection of irrigation does not necessarily serve as a support to the victims. All of them derive their income from agriculture as the main activity.

Another myth is that suicides generally occur in the areas dominated by small and marginal holdings. There is no co-relation between the number of suicides and density of marginal and small farmers in the areas from where these cases are reported.

Apart from the land holdings, the other assets are indicative of economic as well as social position of the households. Cattle sheds, livestock, farm implements, ornaments like 'mangal sutra,' etc. constitute the major assets, which shows the economic and social standing of the person. If it has been found that even the secured assets failed to instill the confidence among the suicide victims.

Veeresh, G.K. 2002, "Farmers Suicides in Karnataka: Report of the Expert Committee for Study on Farmers Suicides, April 2002, Bangalore, Karnataka.

Age Profile of the Victims

Usually age has a close association with the attitude towards life. The higher age group tends to get disappointed at the slightest provocation, whereas the younger age group can react sharply but always have a look at the future. It is quite difficult to analyse the tendency of the middle age group where the mindset is under formulation stage, and ambitions are writ large on their face. The victims are found spread across all the age groups but largely found concentrated between 30 and 45 years of age. Sometimes the age is above 60 years. Briefly, the middle age group seems to be more prone to suicides than younger age group.

Land Use and Cropping Pattern

Jowar, Ragi, Bajra, Paddy, Cotton and Sugarcane are the main crops grown by the farmers, both small and marginal. It is observed that low-value and low-yield cereals predominate the cropping pattern of the households. Jowar occupies the largest share of the area under the rain-fed crops, followed by ragi, bajra and tur dal.

Commercial crops also have a quite significant presence in the cropping pattern. Increased cash requirements to purchase inputs as well as to keep with enhanced quality of life require the farmers to grow these crops. Therefore, the input requirements as well as cash component of the inputs for these crops is higher; this increases the investment in commercial agriculture and the expectations are raised. Risk in aggregate return increases, and larger investments become the trend.

There is marked increase in the land lease activities in Karnataka and that creates significant problem in using the land as a collateral security for the purpose of borrowing. The lessee has no right to records as tenancy is prohibited in the state. The entire leasing operation is carried out under cover. As a consequence, the lessee bear the risk as well as distress where as he will have no access to the mitigating measures. Neither has he any access to credit facilities directly based on the land and therefore, has to depend on the informal money market.

Costs of Cultivation

In the recent past, cost of cultivation of the crops has increased due to higher input prices and increased density of purchased inputs coupled with higher cost of labour. Therefore, demand for cash inputs has increased thereby inflating the per acre cost of production. The higher cost of production makes the agricultural benefits inviable. On the one side, the cost of production increases due to increased input prices, but at the same time market imperfection do not allow the farm households to generate sufficient profits in order to cover the household expenses. The natural outcome of this is to reach moneylenders to meet the cash requirements. It has been found that many of the traders in seeds, pesticides and fertilizers provide credit to the farmers to assist their purchase of inputs. This compels the farmers to buy only the available inputs with the trader, and thereby the farmer walks into the debt trap, and purchases the substandard products.

There has been a tendency among the victim's families to go for commercial crops in pursuit of cash requirements. The cost of cultivation of cash crops like cotton seems to exert heavy economic pressure on the household economy of the suicide victim's families. The production and productivity on the farms of the suicide victims is also reported to be lower than that of others, resulting in the total crop failure. In the commercial crop, the loss of yield gets magnified because of the high cost of cultivation as well as the tendency of cash inputs, whereas in subsistence crops the loss of yield can be tolerated, as the share of cash input is much lower.

The Income Profile

The average household income of the victim's is in the range of Rs. 500-4,000 per month or Rs. 6000-48,000 per annum.

Many times, because of inadequate income support from agriculture and supplementary vocation, it becomes inevitable to obtain credit from the informal sector for meeting even the regular family requirements.

The irony of situation is that the victims do not have sufficient resources to rise above certain barrier of income. Crossing such barriers could only be achieved by adopting low cost organic farming based on cost-effective technology with most suitable crop patterns and indigenous pest management practices.

Minimum Support Price

As shown in table 4.7, the Minimum Support Prices have been increasing steadily and keeping pace with the rate of inflation. But the prevailing market structure has several inadequacies and various interlocking process, leaving a majority of farmers selling the agriculture produce at a lower price than expected, which causes great agony to the farmers.

The Minimum Support Price (MSP) and Market Intervention Scheme (MIS) are designed to alleviate the agency of the farmer. However, the process of administering the MSP and MIS is at market prices. A study carried out by Karnataka government shows a number of lacunae in the MSP and MIS. The study noted that the overhead charges at the procurement centre are so high that the farmers end up in selling well below the prescribed MSP. In fact, the scenario is same all over the country. The quality tests are not carried out properly and private traders run the roost. Many a times, the private traders purchase from the cultivators well below the MSP and finally end up selling the produce at the procurement centres, and thereby picking up undeserving profits, which should have gone to the farmers. Hence, there is a need to revamp the MSP and MIS to eliminate the inadequacies.

TABLE 4.7

Minimum Support Prices of Major Crops

Crops	*1990-1991*	*1999-2000*	*Percentage Increase*
Paddy - Common	205	490	239
Paddy - Fine	215	520	242
Jowar	180	415	231
Bajra	180	415	231
Maize	180	415	231
Ragi	180	415	231
Tur (Arhar)	480	1105	230
Moong (Greengram)	480	1105	230
Urad (Blackgram)	480	1105	230
Groundnut (in shell)	580	1155	199
Soyabean - Black	350	755	216
Soyabean - Yellow	400	845	211
Sunflower Seed	600	1155	193
Cotton	750	1775	123

On 1999, Gaddilingappa cultivated four acrea of land with C-71 variety of Jowar supplied by Cargill. The company assured 20 –25 quintals of yield. However, he got only 1 to 1.5 quintals. All the farmers who had taken up the seed variety went to the agricultural commissioner and senior officials in the agricultural department. An enquiry by the commissioner revealed that the seeds were meant for kharif season and not for rabi. Farmers picketed the Cargill company at Bellary, following which Rs. 380 per acre was given as compensation. Farmers also demanded that the 28 tonnes of seed that was still with company be destroyed.

Crop Failures

Paddy In the preceding cropping season (i.e. 1999) farmers at Harobanavalli village in Shimoga taluka, have reported that 1001 paddy variety which is very popular in the region has failed to perform in the second cropping season. Around ten farmers have reported that the paddy variety 1001 supplied by Rallis company in this village failed.

The cost of the seeds is steadily increasing over the years. The problem with the 1001 variety was that despite the applications of regular fertilisers and other chemicals there was drastic reduction of yield. The farmers have been using the company seeds for long and therefore, depended on market for the seeds. Some of the farmers informed that the company cautioned the farmers for not using 1001 variety second time on their field. They are apprehending this as a possible reason for the failure of crop.

Chilli The case with horticultural crop of chilies is also not good. The crop though does not have much to do with companies for the supply of seed, the farmer saved seeds are mostly used. The farmers largely depend upon two major regions for supply of seeds – one in Karnataka itself called Baidagi and the other is Guntur (Andhra Pradesh).

What is disturbing is the heavy investment for chilli crops in terms of chemical protection. There were number of suicide cases reported due to losses.

For instance, in the Bellary region itself, out of the 35,000 acres of planting with chilies during 1999-2000, around 26,000 acres of the crop suffered total destruction. This amounts to nearly 70 % of the area planted. Per acre investment for the chili crops is between Rs 16,000 to Rs 20,000 of which majority is on the chemical sprays. In turn the returns from the output was around Rs 2000 to Rs 4000 per acre. The reason attributed is that of excess rainfall and the subsequent attack of viral disease. This amounted in huge losses by the farmers who have taken loan from commercial banks at the rate of 30 percent per annum.

The number of suicides related to chili crop failure during 1999-2000 as reported by government agencies was around 8 individuals and the figure reported by one of the concerned non-government group is of 19 individuals.

Public Sector Seed Producers in the State of Karnataka

Name of the Seed	*Seeds for crops of Producing Company*
Karnataka State Seed Corp Ltd.	Paddy, Ragi, Maize, Bajra, Black gram, Cowpea, Redgram, Sunflower, Soyabean, Groundnut, French bean, Cotton.
National Seeds Corporation Ltd.	Maize, Bajra, Paddy, Ragi, Cowpea, Tur, Groundnut, Soyabean, Sunflower, jute
University of Agricultural Sciences	Maize, Cotton
Karnataka State Deptt of Agriculture	Bajra, Green grams, soyabean, Tur
State Farms Corporation India Ltd.	Paddy, Maize, Jute
Karnataka Oilseed Growers Federation Ltd.	Paddy, Maize, Groundnut, Soyabean, Cotton

Another problem with the chili farmers is the storage place for their harvest. The government cold storage facilities are becoming more costlier and the farmers are not getting good prices despite holding the stock for longer periods. This is only adding to their costs and the interests keep accumulating.

Seed Supply: Public Versus Private Companies Participation

All the agencies, which are involved in seed production, cater to the needs of farmers. These agencies need to provide quality seeds to these farmers by either providing certified seeds or labelled seeds. For selling certified seeds, the agencies need to get the certificate from the state certification agency. Otherwise it can also sell labelled seeds on its own. An analysis of all the agencies which are providing various types of seeds shows that only public sector agencies go for certification of seeds. Private sector operate without any proper certification.

In the Kharif of 2000, an analysis of the seed production (that has gone through seed certification) in the state shows that more than eighty percent of the seed production is with the public sector agencies of which major players are Karnataka State Seeds Corporation and National Seeds Corporation of the State. The States' private sector participation in the seed distribution in the state is around 12.28 percent of the total seed distributed.

Interestingly, a detailed analysis of the sixty-five operational private seed companies which are registered with the state seed certification agency, 88 percent of the companies are involved in supply of cotton seeds followed by the maize, paddy and bajra. The list of private companies, which are engaged in production of varieties of seeds is given in the Box.

Crops	*Private Companies engaged in dealing with seeds*
Maize	Mahesh Hybrid Seeds; Varada Seeds; Bhadra Hy seeds Co; Somnath seeds co; Karnataka Hitech Ent; Basaveswara Agro Seeds; Karshek Seeds; Patil Agro; Mahyco; Sumanth Seeds;
Cotton	Mahesh Hybrid Seeds; MSSC; Raja Rajeswari Seeds; Ganga Kaveri Seeds; Siddheswara Seeds; Vani Seeds Co; Sree Hybrid Seeds; Mahantesh Seeds; Rallis Hybrid Seeds; Bhadra Hy. Seeds Co; Somnath Seeds Co; Karnataka Hitech Ent; Nandi Seeds; T S R Amareswara; Amarewara Agri Tech; Sagar Seeds; Laxmi mills; Vinayaka Agro Seeds; Zauri Seeds; SPIC Bio Tech; Karnataka Seeds; HLL; Mahyco; Vasu & Co; Karnataka Agro Genetics; Mohan Traders; Niranjan Seeds; Mahagujarath Seeds; Adavi Amareswara Seeds; Sumanth Seeds; MHSC; Novarties Ltd; Laxmi Hy. Seeds; Rait Hy Seeds; Viba Agro Tech; Sri Amarewara Seeds; Manjushree Plantations; Nuziveedu Seeds; Shiva Seeds; T N Amareswara Seeds; Deepthi Seeds; HYCO; Venkateswara Seeds; Advanta; NFCL; Banashankari Seeds; Ashwini Seeds; Kwality Seeds; Shathavahana; Sumantha Hy. Seeds; Bhubaneswari Seeds; Prabhat Agri Bio-Tech; Amarewari Hybrid Seeds; Kaveri Seeds; Pro Agro Seeds; Pruthivi Agro Tech.
Paddy	Mahesh Hybrid Seeds; Raja Rajeswari Seeds; Ganga Kaveri Seeds; Varada Seeds; Bhadra Hy seeds Co; Mahyco; Agro Seeds
Bajra	Karnataka Hitech Ent; Sagar Seeds; Karnataka Agro Seeds; CJ Parekh; Mahyco
Sunflower	Sagar Seeds
Tur	Surya Seeds; Agro Seeds

Trends of Suicides

Even though suicides have existed since time immemorial, a scientific debate about the process of suicides began only during the last decade in India

TABLE 4.8
Global Suicide Rate per 100,000 Population, 1950-1995

Year	*Suicide Rate per 100,000*
1950	10.0
1955	12.5
1960	11.0
1965	11.5
1970	13.5
1975	14.0
1980	16.0
1985	14.0
1990	14.0
1995	16.0

(Gururaj 2003)

Graph i

and three to four decades back in industrialized countries. India stands fourth in the rate of suicide in the world.

During 1989-99, the population of the country increased by 21.5 per cent, while the reported suicides increased by 32.5 per cent as per the data from National Crime Records Bureau for the same period, clearly showing higher growth in suicide rates in the country. The incidence of suicides increased from 40,000 in the year 1967 to 110,000 in the year 1999 recording an increase by 175 per cent.

Karnataka had no history of farmers committing suicide when crops or market failed, although there were agitations of farmers in the past. The first incidence of farmers' suicide, which attracted considerable attention of media and public, was reported on 12 December 1997 when Mr. Shivaraj Mainalle of Siddeshwar village in Bidar district committed suicide. A few studies were available on this first phase of suicides in Karnataka.

Suicide is not increasing only in India or Karnataka, but all over the world as shown in table 4.8 and **graph i**. It has increased from 10 to 16 per lakh during 1950 to 1995.

Within two decades suicide rate in India has increased from 40 to 115 per lakh, i.e., more than two times increase as shown in table 4.9 and **graph ii**. Suicide rates across India are shown in the map.

The suicide rate in India in the year 1999 was 11 persons per lakh of population per year with 110,000 reported suicides according to a study by the National Institute for Mental Health and Neuro Sciences. Karnataka with 12,488 suicides, stood third among the states in India during 1999, next only to West Bengal and Maharashtra. Major causes of suicides noted in the study are illness (20 per cent), family problems (20.6 per cent), poverty (2.6 per cent), disappointment in love (3.4 per cent), and examination failures (2.1 per cent). However, causes were not known clearly in more than 50 per cent of the cases as shown by table 4.10.

The scientific studies on suicides of farmers in the United Kingdom included farm owners, tenants, and managers consisting of 84 farmers out of 526 deaths reported between 1979 and 1990. It concludes, "The most common

combination of causes for suicide was mental health, work, finance and family or partner. Most suicides were the endpoint of a series of difficulties developed over a time rather than a response to an acute crisis and in this respect farmers were no different from other people who committed suicide." The typical newspaper headline linking suicide in farmers was "stressed, misunderstood and lonely," linking suicide of farmers to financial problems, social isolation and low status in the United Kingdom. According to the study, farmers are one of the occupational groups at greatest risk of suicide in England and Wales. Most of the suicide reports from the United States of America were reported as related to farming crisis in 1980s.

Reports of suicides in general do occur in Islamic countries like Pakistan, Bangladesh, Malaysia, etc. although suicide is condemned in Islam. According to a study, 45 per cent of depressed patients in Pakistan showed suicidal psychopathology, which is common among females. Most suicide attempts were from young adults and married women.

In Sri Lanka suicides and attempted suicides have become a public health priority. The suicide rates went up from 18 persons per lakh of population in 1971 to 40 persons per lakh in 1996 compared to 11 persons per lakh in India. Acute pesticide poisoning is a major public health problem. The Government of Sri Lanka has set up a Presidential Task Force to investigate into the high rates of suicidal deaths. The problem of suicides was most serious in farming communities, particularly among the new settlers in dry zones of north-central regions, irrigated by a huge dam built in 1970s.

China is one among the suicide-prone countries. The striking aspect of suicides in China is the high incidence of suicides among young women in rural areas. Malaysia has reported a suicide rate of 10 persons per lakh population. In a country having 55 per cent of Muslims, 34 per cent Chinese and 9 per cent Indians, the suicide rates among the ethnic groups are higher among the Hindus, particularly of South Indian origin.

TABLE 4.9
Suicides Trends in India, 1980-2000 (Per 100,000)

Year	*Male*	*Female*	*Total*
1980	20.0	20.0	40.0
1985	30.0	25.0	55.0
1990	40.0	35.0	75.0
1995	50.0	32.5	82.5
1997	55.0	35.5	90.5
1999	58.0	42.0	100.0
2000	75.0	40.0	115.0

(Gururaj 2003)

Gururaj, G. 2003, "Seminar Presentation of Prevention of Farmers' Suicides in Karnataka, 20 October 2003, Department of Epidemiology, National Institute of Mental Health and Neurological Sciences (NIMHANS), Bangalore.

Graph ii

TABLE 4.10
Causes of Suicides in Karnataka 2002-2002

Causes	*2000*	*(%)*	*2001*	*(%)*	*2002*	*(%)*
Other Prolonged Illnesses	2856	23.2	2791	23.6	3180	25.6
Causes not Known	3802	30.8	3032	25.6	2793	22.8
Family Problems	1889	15.3	1911	16.1	2038	16.6
Other Causes	1127	9.14	1314	11.1	1753	14.3
Insanity/Mental Illness	493	4	647	5.47	569	4.6
Poverty	515	4.18	432	3.65	421	3.4
Bankruptcy or Sudden change in Economic Status	201	1.63	265	2.24	237	1.9
Failure in Examination	164	1.33	171	1.45	198	1.6
Unemployment	179	1.45	237	2	158	1.3
Not having children	119	0.97	83	0.7	119	1.0
Love Affairs	158	1.28	126	1.06	104	0.8
Dowry Dispute	87	0.71	92	0.78	101	0.8
Drug abuse/Addiction	38	0.31	74	0.63	94	0.8
Cancellation/Non-settlement of Marriage	47	0.38	71	0.6	78	0.6
Death of dear person	142	1.15	53	0.45	67	0.5
Property Dispute	117	0.95	59	0.5	64	0.5
Paralysis	40	0.32	92	0.78	63	0.5
Professional/Career Problem	74	0.6	89	0.75	52	0.4
Fall in social reputation	175	1.42	134	1.13	37	0.3
AIDS/STD	33	0.27	37	0.31	35	0.3
Cancer	33	0.27	37	0.31	35	0.3

Suspected/Illicit relation	18	0.15	34	0.29	34	0.3
Ideological causes/Hero worship	2	0.02	6	0.05	13	0.1
Physical abuse (Rape/Incest, etc)	2	0.002	27	0.23	7	0.1
Divorce	9	0.07	9	0.08	6	0.1
Illegitimate Pregnancy	7	0.06	10	0.08	4	0.01

(Gururaj 2003)

TABLE 4.11

Suicide in Karnataka in Rank order

Districts	***2001***	***Rank 2001***	***2002***	***Rank 2002***	***2003 (up to July)***	***Rank 2003***
Bangalore City	1352	1	1440	1	830	1
Bangalore District	670	2	789	2	509	2
Davangere	361	16	692	3	356	4
Gulbarga	452	8	658	4	164	20
Belgaum	448	9	576	5	363	3
Shimoga	330	19	573	6	296	5
Dakshina Kannada	429	10	554	7	295	6
Tumkur	539	4	534	8	290	7
Chitradurga	339	17	474	9	219	10
Chikmagalur	394	14	417	10	244	9
K. Railways	196	26	409	11	278	8
Bellary	323	20	386	12	211	13
Mysore	462	7	382	13	207	14
Kolar	515	5	380	14	179	17
Mysore City	607	3	367	15	212	12
Coorg	393	15	352	16	185	15
Mandya	404	12	345	17	168	18
Udupi	180	27	342	18	185	16
Hassan	425	11	337	19	165	19
Bagalkot	234	23	301	20	218	11
Haveri	168	28	249	21	122	23
Bijapur	321	21	230	22	144	21
Koppal	123	31	224	23	120	24
Dharwad	306	22	221	24	127	22
Uttara Kannada	338	18	205	25	120	25
Bidar	214	25	176	26	66	30
Gadag	129	30	150	27	96	26
Raichur	226	24	149	28	68	28
Hubli-Dharwad City	463	6	147	29	92	27
KGF	396	13	109	30	68	29
Chamaraj Nagar	144	29	102	31	63	31
Total	**11,881**		**12,270**		**6,660**	

(Gururaj 2003)

Suicides in Karnataka in various districts with their rank are given in table 4.11. Table 4.12 and **graph iii** shows the trends in per centage of suicides among men and women in Karnataka. Variation in suicides across the cities is shown in table 4.13.

TABLE 4.12
Suicide Trends in Karnataka (%)

Year	*Men*	*Women*	*Total*
1996	5533 (63)	3287 (37)	8820 (100)
1997	6380 (62)	3845 (38)	10225 (100)
1998	6934 (63)	4000 (37)	10934 (100)
1999	7851 (63)	4637 (37)	12488 (100)
2000	7938 (64)	4437 (36)	12375 (100)
2001	7871 (66)	4010 (34)	11881 (100)
2002	8080 (66)	4190 (34)	12270 (100)

(Gururaj 2003)

Farmers Suicides in Karnataka

Farmers suicides are no longer a feature of drought prone and economically backward districts. The phenomena have spread to all regions including prosperous agriculture belts like Mandya. While 49 suicides, the highest figure recorded, took place between April 1 and October 25 in drought prone Hassan district, during the same period 22 suicides took place in Mandya, the state's sugar bowl and heartland of Cauvery irrigation network. Eighteen suicides were committed in Shimoga, a paddy-growing district of high rainfall. Fourteen farmers ended their lives in Heveri district, which has normal rainfall. (Menon 2003)

The Indian government celebrated its triumph in Cancun, but the negative impact of globalization on agriculture through the World Trade Organization regime has already compounded the agrarian crisis brought in by drought. Several agricultural commodities have seen a fall in the prices in the last three years owing to imports. The lifting of agricultural and power subsidies have pushed up the cost of cultivation substantially and the withdrawal of safety nets like the universal public distribution system for food has increased expenditures for poor families.

The burden of irredeemable debt has eroded the living standards of those who are already poor, throwing them to the mercy of moneylenders, and depriving them of their dignity and standing in the rural society. The noose is already around the neck of the farmer.

The phenomenon of suicides amongst farmers in Karnataka has been a recurrent theme in agricultural sector since 1998. The sudden and alarming spurt in suicides since April 2003, however appears to indicate a new trend and pattern. Farmer's suicides are no longer a feature of drought prone or the economically backward districts alone, and nor are they occurring only in pockets of high investment agriculture like cotton growing tracts.

Menon, Parvathi 2003, "From Debt to Death", Frontline, 10 October 2003.

Graph iii Suicide Trends in Karnataka

(Gururaj 2003)

TABLE 4.13
Variation in Suicide Rates Across Cities (1997-99)

1997		***1998***		***1999***	
Bangalore	(24.1)	Bangalore	(31.1)	Bangalore	(35.1)
Kanpur	(22.3)	Indore	(29.1)	Indore	(34.8)
Nagpur	(18.2)	Kanpur	(26.3)	Coimbatore	(19.9)
Chennai	(17.2)	Coimbatore	(21.8)	Kanpur	(19.3)
Indore	(17.2)	Nagpur	(21.0)	Nagpur	(18.9)
Coimbatore	(16.7)	Bhopal	(17.5)	Chennai	(17.3)
Bhopal	(16.1)	Chennai	(16.6)	Bhopal	(16.6)
Madurai	(14.7)	Surat	(16.4)	Surat	(14.2)
Kochi	(13.7)	Madurai	(14.5)	Kochi	(13.9)
Pune	(12.3)	Kochi	(12.7)	Pune	(12.2)

(Gururaj 2003)

Methods for committing suicides adopted by men and women in Karnataka are shown in the in the **graphs iv and v**.

The pressure from moneylenders to repay loans appears to drive farmers, particularly the small and marginal farmers, to take their own lives. Loans from institutional lending sources typically account for just 10 per cent of a small farmers' credit needs and there appears to be little evidence of banks forcing their creditors to repay their loans. For example, in Heveri district, the per centage recovery of loans to agriculture by banks was 49 per cent, 44 per cent and 47 per cent respectively during the last three years. All banks have rephrased their loan and interest structures. The disbursements of banks are

Graph iv **Graph v**

going down, as farmers are unable to repay loans because this is the third year of crop failure.

Unable to get the loan from banks, farmers have been forced to borrow from moneylenders at the exorbitant rate, which usually vary from 24 to 60 per cent per annum, sometimes even at higher rate. Though the coercion by the moneylenders rarely has taken the form of physical assault, but the pressure always continue. Moneylenders come in the form of a group and harass the debtor that results in considerable loss of face and self-esteem for the latter. After the suicide, the family of the victim does not disclose the identity of the moneylender, usually a large landlord. As there are no generally written agreements between the moneylender and the victim that makes it difficult to punish those who practise usury.

In Mandya, there has been a spate of suicides largely in Maddur Taluk, though Mandya is relatively an agrarian prosperity. But due to the low storage capacity of dam in the cauvery basin, farmers had to dig bore wells, which unfortunately failed.

Information was collected about the suicidal death of the farmers in Mandya, Bangalore Rural and Hasan districts (table 4.14).

Boraih aged 55 years of village Gunnanaya-kandahalli in Mandya district committed suicide on 6 September 2003. He has borrowed more than one lakh from friends and moneylenders, besides a loan of Rs. 45,000 from Syndicate Bank. His elder son died four months back. He received no compensation from the government. His last rites were conducted by the contribution of Rs. 6,000 from friends, villagers and relatives. Now, the main breadwinner is the daughter-in-law.

Similarly, H. K. Hanumme Gowda of Bidarhasahalli Village committed suicide on 12 August 2003. He had borrowed money from Vijay Bank, PLD Bank and other institution of Rs. 55,000. He had 70 trees of mango, which died up due to drought. Now family does not have any source of income, and finds it hard to find any breadwinner. His wife is seeking help for the education of the children.

The case of Puttaswamy of village Bidarahalli in Maddur Taluk of Mandya is not different. Having only three acres of land he has taken loan of Rs. 26,000 from the Cooperative Society and Rs. 50,000 from moneylenders. No

TABLE 4.14

Suicidal Deaths of Farmers in Mandya, Bangalore Rural and Hassan Districts

Sl. No.	*Name of the Deceased*	*Age*	*Village*	*District*
1.	Boraih	55	Gunnanyakanhalli	Mandya
2	Hanume Gowda	35	Bidarhosahalli	Mandya
3	Puttaswamy	48	Bidarhalli	Mandya
4	Kadi Gowda	70	Huligerepura	Mandya
5	Chennamma	60	Valagerehalli	Mandya
6	Puttaswamy Gowda	55	Chikkanaddi	Bangalore Rural
7	Basve Gowda	60	Jagadpur	Bangalore Rural
8	Puttalinge Gowda	45	Eggalur	Bangalore Rural
9	Puttaswamy	34	Hosakapau	Hassan
10	Lakkegmida	45	Kandali	Hassan
11	Chennapasan	70	Harnihalli	Hassan
12	Shivanane	50	Geejahalli	Hassan
13	Somshekhar	40	Bendekere	Hassan
14	Basvaraju	30	Hiriyur	Hassan
15	Chandrappa	60	N. Bendihalli	Hassan
16	Shiva Swamy	40	Halbagenehalli	Hassan
17	Hemaji Naika	45	Margenduhalli Tandya	Hassan
18	Lokesh	40	Belawalihalli	Hassan

(RFSTE 2003)

TABLE 4.15

Suicides by Farmers in Karnataka (1 April to 10 November 2003)

Sl. No.	*District*	*Cases Reported*	*Cases Rejected for Compensation*	*Sl. No.*	*District*	*Cases Reported*	*Cases Rejected for Compensation*
1	Bagalkot	16	13	15	Shimoga	27	19
2	Bangalore (Rural)	22	07	16	Kolar	11	05
3	Bangalore (Urban)	02	0	17	Mysore	13	09
4	Bldar	20	09	18	Udipi	01	01
5	Hassan	54	32	19	Kodagu	03	0
6	Chamaraj Nagar	08	01	20	Belgaum	34	24
7	Haveri	26	19	21	Davangere	33	29
8	Uttara Kannada	03	0	22	Bellary	26	17
9	Dharwad	17	13	23	Chitradurga	31	20
10	Koppal	15	10	24	Gulbarga	03	02
11	Mandya	38	27	25	Bijapur	13	10
12	Chikmagalur	15	08	26	Dakshin Kannada	08	02
13	Raichur	04	02	27	Gadag	08	05
14	Tumkur	27	15		**Total**	**478**	**299**

(Menon 2003)

RFSTE, 2003, "A Study by RFSTE in Mandya, Bangolre Rural and Hassan District of Karnatka, 2003

Farmers Suicides in Hassan, Mandya and Belgaum

compensation was received, and last rites were carried out with Rs. 25,000 donated by Abbas Ali Bohra, a social worker from Channapatna.

Kadi Gowda of Huligerepure in Mandya, who was around 70 years old, hanged himself due to reported failure of crops since last three years. He has the loan of more than one lakh of which Rs. 80,000 was from private parties. He also collected the loan for the marriage of his daughter. It is one of the few cases where the deceased is able to get Rs. one lakh compensation from the government.

There is a case when the eldest lady of the farmer's family committed suicide when all her efforts to seek the loan for agriculture from government turned futile. Smt. Chenamma of village Valagerehalli of Muddur Taluk in Mandya district hanged herself in front of the house. She had borrowed heavily from private sources. No compensation has been paid since the land was not in her name. If compensation were paid, her son would like to spend the money on the education of his children.

Due to pressure of loan repayment, Puttaswamy Gowda of Chikannadodi village of Channapata Taluk in Bangalore rural district committed suicide by consuming poison. He had borrowed around Rs. 20,000 from State Bank of Mysore and around Rs. 160,000 from moneylenders. Family cultivates betel leaves by paying Rs. 20/hour from others' tubewells. Karnataka government has sanctioned compensation of Rs. one lakh. Mrs. Sonia Gandhi also paid Rs. 25,000.

The study conducted by RFSTE unambiguously shows that growing indebtedness in the rural areas among the farmers is the main reason for the farmers to commit suicide in Karnataka. Almost all the farmers who have committed suicide have taken the loan, which costs more than their total land assets. Situation became worst when the government institutions stopped giving loan to the farmers. While there are varieties of reasons, indebtedness is the common factor in all the suicides. Over 400 farmers in the states have committed suicide between April 1, and October 25 in 2003. By the end of November 2003, the number of suicides increased to 478. With 54, Hassan tops the list followed by Mandya and Belgaum (table 4.15). Table 4.16 gives the particulars of suicides reported by the press. Names and addresses of the suicide victims of 2000-01 is shown in table 4.17. Table 4.18 gives the particulars of cases and relief of provided by Karnataka.

However, according to a report, nearly 500 farmers have committed suicide in Karnataka during 2003 till the midweek of October. (Vijay Times, 2003)

RFSTE Conducted Survey in the Following villages:

Mandya District

1. Gunnanayakanahalli
2. Bidarhusahalli
3. Bidarhalli
4. Huligerepura
5. Valagerhalli

Vijay Times 2003, "Farmers Suicide Toll Nearing 500 Mark in State," Vijay Times, 19 October 2003, Bangalore.

Bangalore Rural District

6. Chikkanadodi
7. Jagadpur
8. Egglur

Hassan District

9. Hallekepol
10. Kssakopalu
11. Kandali
12. Harnahalli
13. Geejahalli
14. Bendekere
15. Hariyur
16. Nendihalli
17. Holbagenahalli
18. Margenduhalli Tandya
19. Belawalahalli

TABLE 4.16

Particulars of Sucide Cases Reported by Press

S.N.	*Name and address of the Deceased Farmer*	*Crops grown*	*Newspaper/s with date*
1.	Putte Gowda, Mudigere Village, Belur Taluk, Hassan	Potato, Maize and Ragi	*Deccan Herald* 31.10.2000
2.	Statement of Hon'ble Revenue Minister on the floor of the Legislative Council about the death of 12 farmers in Bida district due to price crash in redgram	Redgram	*Kannada Prabha* 25.11.2000
3.	Manjunath, Dudda Village Hassan	Potato, Green Chilli and Cucumber	Prajavani 18.12.2000
4.	Mahdevappa Bane, Navalr Village, Dharwad	Potato	*Samyuktha Karnataka* and *Deccan Herald*17.01.2001
5.	Basaya Hraya Muka Shivaiah, Suthagthatti Village Dharwad	Well loan	*Samyuktha Karnataka*, *Prajavani* and *Deccan Herald* 20.01.2001
6	Sri Saibaba, Mamadapura Village Raichur	Borewell failure	*Prajavani* and *Deccan Herald* 22.01.2001
7.	Manaiah, Kullegallu, Bellary	Maize	*Samyuktha Karnataka* 11.01.2001
8.	Shyarayappa Hansi	Potato	*Samyuktha Karnataka* 20.01.2001
9.	Aswathachari, Suredapura Village, Hessaraghatta, Bangalore North	Cabbage and Cauliflower	*Vishala Karnataka* and *Kannada Prabha* 03.02.2001
10.	Channabasappa Hugan, Chukkanakallu Village, Kopai	Due to spurious Cotton seeds	*Deccan Herald* and *Vishala Karnataka* 05.02.2001
11.	Hirebasappa Mallappa, Devakki Mudhola Village, Yelaburga Taluk	Borewell failure	*Prajavani*, *Vishala Karnataka*, and *Kannada Prabha* 09.02.2001

12.	Ningappa Basappa Hiraganna, Javoor, Navalagunda.	Fodder and Jowar	*Prajavani*16.02.2001
13.	Press Report of Suicidal Cases of farmers due to areca nut price crash	Areca nut price crash	*Prajavani* 16.02.2001
14.	Chennamma Sadashivaiah Hiremath, Kundagola	Chilli	*Vishala Karnataka* 12.02.2001 *Prajavani* 25.02.2001
15.	Yashoda, Sokke Village, Jalur Taluk	Maize	*Kannada Prabha*, *Vishala Karnataka* and *The Times of India* 23.02.2001, and *Prajavani* 24.02.01
16.	Muni Singh, Biru Singh Rajapura, Diggi, Shahapur Taluk	Redgram	*Deccan Herald* and *Samyuktha Karnataka* 25.02.2001
17.	Nagappa Kaliveerappa Mittimani, Hale Kumoor Byadagi	Crop loan over dues	*Prajavani*, *Samyuktha Karnataka* and *Vishala Karnataka* 10.03.2001
18.	Edigara Jadeyapa Aluleeneha, Bellary	Paddy and Maize Crop failure	*Prajavani* and *Kannada Prabha* 14.03.2001
19.	Shivalingappa Antala, Hirehonnahalli Kalaghatagi Taluk	Well loan	*Prajavani*15.03.2001
20.	Sreenivasa Marasanahalli Chikkaballapur Taluk	Tomato and Cabbage	*Prajavani*, *Samyuktha Karnataka*, *Kannada Prabha* and *Vishala Karnataka* 21.03.01
21.	Shiva Poojappa Mahadevappa, Kalavaye Village, Dharwad	Crop failure	*Samyuktha Karnataka* and *Deccan Herald* 15.03.2001
22	Press report on suicide case due to borrowings	Debt burden	*Samyuktha Karnataka* 17.03.2001
23.	Bheenama Shankar, Afazalpur	Crop loan	*Samyuktha Karnataka* 18.03.01
24.	Shesha Reddy, Dummur Village, Bellary	Maize and Chilli	*Kannada Prabha* and *Vishala Karnataka* 16.03.2001
25.	M. R. Nagaraj, Mudavadi Village, Chikkaballapur Taluk	Potato	*Kannada Prabha*, *Vishala Karnataka* and *Deccan Herald* 23.03.2001
26.	Shivalingappa Basavalingappa, Antala Honnali, Kalaghatagi	Borewell failure	*Deccan Herald* 16.03.2001
27.	Bheema Shankar Neeluka, Afzalpur Taluk.	Crop failure	*Deccan Herald* 16.03.2001
28.	Press report on farmer's suicide, Dumanurhalli, Bellary	Crop faiulre	*Deccan Herald* 16.03.2001
29.	Chennabasappa Yellappa Kambura, Hanchinala Village, Kundagola Taluk	Debt burden	*Deccan Herald* 20.03.2001

TABLE 4.17

Names and Addresses of Suicide Victims in Karnataka during 2000 and 2001

Case No.	*Name and Address of the Farmer*
001	Ajja Naik, S/o Choplanaika Chinnasamudra, Nellige, Angod Hobli Mayakonda Police Station, Davangere Taluk & District.
002	Amathi Bhavani, S/o Baramappa Amboli grama, Aravatagi, Alnavar, Dharwad Taluk & District.
003	Annappa, S/o Nanjegowda Melagodu, Hassan Taluk & District.
004	Bandaiah, S/o Madivalaiah Basaga Grama, Basavakalyana Taluk, Bidar District.
005	Basaiah, S/o Eraiah Mukashivaianavar, Suthagatti, Hubli Taluk, Dharwad District.
006	Basalingappa Dundappa Dugatti, Hirenandi Gokak Taluk, Belgaum District.
007	Basanagowda Somanagowda Mannangi, Naganoor Village, Haveri Taluk & District.
008	Basappa, R. A., alias Basavarajappa, S/o Adiyappa Rangapura, Singatagere, Kadur Taluk, Chikmagalur District.
009	Basappa Reddar Benahal, Hunakunte Ron Taluk, Gadag District.
010	Basavaraj Keshawarayana Bande, B. Hampapatna, H.B. Halli Taluk, Bellary District.
011	Basavaraj, S/o Eranna Andralu, Bellary Taluk & District.
012	Basavarajappa, S/o Byrappa Kodigavalli, Hiregondanur, Chitradurga Taluk & District.
013	Basavaraju, H. N. S/o Nanjundappa Harisamudra, Santhatavalli, Honnavalli, Tiptur Taluk, Tumkur District.
014	Basavegowda, S/o Karigowda Odiyara Hosahalli, Gagenahalli Bilikere, Hunsur Taluk, Mysore District.
015	Beeru Vittu Yedgae, S/o Vitu Yedage Bisinalu yerebailu Grama, Mundagodu Taluk, Uttara kannada District.
016	Bheemappa, S/o Kodalappa kadlebalu, H. B. Halli Taluk, Bellary District.
017	Bheemappa Basappa Shivabasakka, Urf Talwar Maranabeeda, Hanagal Taluk, Haveri District.
018	Chalapathi, S/o Muniramappa Holali, Hosur, Kolar Taluk & District.
019	Challanagowda, S/o Bhimanna Gowda B. Koppa, Tharalaghatta, Kundagod Taluk, Dharwad District.
020	Chandrappa, S/o Rangappa Agrahara, Nagenahally, Sakarayanapatna, Kadur Taluk, Chikmagalur District.
021	Channabasappa, S/o Guru Basappa Chukanakallu, Bhadurabanda, Kasaba, Koppal Taluk & District.
022	Channaiah, S/o Sadasivaiah Hiremath, Kundagol, Kundagol Taluk, Dharwad District.
023	Channappa Nagappa Kadabina, Yadahalli, Sangareshkoppa, Soundatti Taluk, Belgaum District.
024	Chowdappa, S/o Hanumanthappa Kurumaradikere, Ingladalu, Chitradurga Taluk & District.
025	Era Reddy, S/o Gnana Reddy Handralu, Basavanakalyana Taluk, Bidar District.
026	Eranna, S/o Dodda Eranna Kappagal, Kolur, Bellary Taluk & District.
027	Eswarappa, S/o Madaiah, Kumaranahalli, Alivada, Harihara Taluk, Davangere District.
028	Eswarbhat, S/o Eswara Narayanabhat, Herevalli, Chikkanadoda Grama, Honnavar Taluk, Uttara kannada District.
029	Gangadhara, S/o Basappa, Kennadlu, Ingladalu, Chitradurga taluk & District.
030	Gopalappa, S/o Chinakonapa Kambalapalli, Munganahalli, Chintamani Taluk, Kolar District.
031	Hanuma Reddy Krishna Reddy Darama Reddy, Neeraligi, Haveri District.
032	Hanumanthanaik, S/o Devajanaik Channasamudra, Anagod Hobli, Davangere Taluk & District.
033	Hanumanthappa, S/o Shivappa Barangi Village, Soraba Taluk, Shimoga District.
034	Hanumanthappa, S/o Anjanappa Honenahalli, Devapura, Hosadurga Taluk, Chitradurga District.

035 Hanumantharayappa, S/o Veeranna T. N., Kote Village, Parasurampura, Challakere Taluk, Chitradurga District.

036 Jadappa, S/o Yamunappa Elubenchigram, Kurugod, Bellary Taluk & District.

037 Jagadishgowda, S/o Gangadharappa Godwa Baradavalli, Thalaguppa, Sagara Taluk, Shimoga District.

038 Kamsagarappa, S/o Kalappa Panchanahalli, Singadagere, Chikmangalur District.

039 Kenchaveerappa, B. S/o Bhimappa Lygur, Anagod, Davangere Taluk & District.

040 Kotrappa, S/o Gowdar Kariyappa Rumagatta, Meedanaikanahally, Thuruvattur, Chitradurga Taluk & District.

041 Krishna Reddy, S/o Venkata Reddy Doddashivara, Malur talik, Kolar District.

042 Kulambi Rangappa, S/o Eswarappa Kumaranahalli, Harihara Taluk, Davangere District.

043 Kumara Gowda, S/o Gara Gowda K. Belagallu, Siruguppa taluk, Bellary District.

044 Lingaiah, S/o Rudraiah Gadagiyapura, Ajampur, Japanakottu, Shivani, Tarikere Taluk, Chikmagalur District.

045 Lingaraja, S/o Sadashivappa Gowda Ajjarani, Guddapura, Banavasi Sirsi Taluk, Uttara kannada District.

046 Lokeshappa, S/o Palakshappa Haramagatta Village, Shimgoa Taluk & District.

047 Mahadevappa, S/o Baramappa Bovi Navalur, Dharwad District.

048 Mahadevappa, S/o Channappa Kudalapura, Nanjangud Taluk, Mysore District.

049 Mallappa Basappa Korthike Hittannahalli, Bijapura Taluk & District.

050 Manjunath, S/o Boregowda Dudda, Hasan Taluk & District.

051 Manjunath, S/o Channabasappa Gubbihalli, Banur, Sakarayapatna, Kadur Taluk, Chikmagalur District.

052 Manjunatha, S/o Viswanathaiah Sadarahally, Turuvakere Taluk, Tumkur District.

053 Meenakshamma, W/o Late Narayanappa Kolavanahalli, Doddamalli, C. B. Pura Taluk, Kolar District.

054 Munnasingh, S/o Bikkushing Rajaputh Diggi, Shahapur Taluk, Gulbarga District.

055 Murthiyappa, S/o Palakshappa Kurki, Angod Hobli, Davangere Taluk & District.

056 Nagappa Kalaveerappa Mattimani Kummur, Byadagi Taluk, Haveri District.

057 Nagappa Rudrappa Poojara Kolur, Haveri Distirct.

058 Nagappa, B. Karekathanahally, Kalkeri Thanda, Akki Alur Hobli, Hangal, Haveri District.

059 Nagaraju, S/o Thippanna Huchangidurga, Harapanahalli Taluk, Davangere District.

060 Nagaraju, M. R. S/o Chikkarame Gowda Mudavadi Grama, Holur Hobli, Kolar Taluk & District.

061 Nageshappa Yellappa Honamanavar, Sadaguppi, hangal, Haveri District.

062 Nandyappa Ningappa Siruguppe Sankonatti, Athani Taluk, Belgaum District.

063 Narayanaswamy, S/o Late Rangappa kalandur Grama, Kasaba Hobli, Kolar Taluk & District.

064 Panchakshari Shivappa, Ganigere Kodaballu, Haveri District.

065 Parameswarappa, S/o Shivalingappa Chikkagondanahalli, Thuruthuru, Chitradurga Taluk & District.

066 Parvathegowda, S/o Malegowda Hulikere, Halebeedu, Belur Taluk, Hassan District.

067 Pradeep Hanumanthappa Kamanahalli Hirekanagi Village, Hanagal Taluk, Haveri District.

068 Prannara Eswarappa, S/o Siddalingappa Mathikote Village Shikaripura Taluk, Shimoga District.

069 Puttaraju, S/o Chandrappa Venkateshwara Nagar, Kadur Town, Chikmagalur District.

070 Puttegowda, S/o Rudregowda Mudigere, Belur Taluk, Hassan District.

071 Raja, S/o Puttegowda Madanur, Arakalgud Taluk, Hassan District.

072 Ramappa, S/o Bheemappa Kerali Itigi, Kukanoor, Yelburga Taluk, Koppal District.

073 Ramappa C., S/o Munivenkatappa Bamasandra, Gollahalli Dugsandra, Mulbagal Taluk, Kolar District.

074 Sangappa Gangappa Chinnikatti Thadasa, Byadigi Taluk, Haveri District.

075 Sangappa Siddappa Inapur Alias Yalagi, Othihal, Aranala, Sindhagi talik, Bijapur District.

076 Sannaswamy, S/o Late Thimmegowda Galenahalli, Koppalu, Hassan Taluk & District.

077 Sekharappa, S/o Kadubagere Kottappa, Diddige, Jagalur Taluk, Davangere District.

078 Sesha Reddy, S/o Thimma Reddy Dhamur, Kolur, Bellary Taluk & District.

079 Shekappa Basatappa Vali Muthagigrama, Dummavada, Kalagataki Taluk, Dharwad District.

080 Shambulingappa, S/o Gurupadappa Hiregonda Sangur, Chittur Taluk, Kalagi Hobli, Gulbarga District.

081 Shankaranarayan, S/o Janardhana Hegde, Devisara, Amaranchi, Kanasur, Umbalamani, Siddapur Taluk, Uttra Kannada District.

082 Shanmughappa Basavanappa Banakara, Doddihalli, Hirekerur, Haveri District.

083 Sharannayya, S/o Rachayya Hangaragi Valjapur, Alland Taluk, Gulbarga District.

084 Shivakka, D/o Basavana Godi Dasanahatti, Kundargi, Gokak Taluk, Belgaum District.

085 Shivappa Channappa Dolli Chikeri, Hirekang, Hosahally, Hangal Taluk, Haveri District.

086 Shivappa Shankarappa Nandihally Ballapura, Hirekerur, Haveri District.

087 Shivayogaiah Paraiah Neelargi, Bedageri, Gadag Taluk & District.

088 Siddalingappa, S/o Maragappa Shetty Kithanakere, Kanakalli, Arasujere Taluk, Hassan District.

089 Siddappa, S/o Gundappa Hadapad, Gotur, kalagi, Chitapur Taluk, Gulbarga District.

090 Somappa mahadevappa Mudodi Tjirumal Koppa, Vararu, Hubli Taluk, Dharwad District.

091 Somashekarappa, S/o Halappa Kanihalli, Bendhekere, Banavara, Arasikere Taluk, Hassan District.

092 Srinivasa, S/o Govindappa Marasanahalli, C.B. Pura Taluk, Kolar District.

093 Subhash Chandra, S/o Hanumantharaya Vanadurga, Gogi, Shahpur Taluk, Gulbarga District.

094 Suresh, Mahadevappa Madli Yelavatti, Hangal, Haveri District.

095 Theerthalingappa M., S/o Halappa Daneshalli, Honnali Taluk, Davangere District.

096 Udachappa Gowdappa Sanagara Bommanahalli, Hangal, Haveri District.

097 Ulavappa Channabasappa Aralikate Bommegatti Grama, Kalagatgi Taluk, Dharwad District.

098 Vasappa Basappa Mewundi Yerikuppi, Ranebennur, Haveri District.

099 Vasudeva Reddy, S/o Thipaiah Belagatta, Turavanur, Chitradurga Taluk & District.

100 Veerabhadrappa Shivappa Hampiholi, Sangali Village, Sorebana, Ramdurga Taluk, Belgaum District.

101 Vijaya Bai, W/o Puttanayak Bevinahalli, Brahmasagara, Chitradurga taluk & District.

102 Virupakshappa, S/o Sannaveerappa Biserahalli, Begur Dhummavada, Ullambigrama kalagatgi Taluk, Dharwad District.

103 Yamunappa Shivappa, Hosakere Yavagalu, Holialur, Ron Taluk, Gadag District.

104 Yelappa Gaikwad, S/o Bhimappa Somapura, Naragund taluk, Gadag District.

105 Yesodamma, D/o Late Ajjappa, Sokke, Jagalur Taluk, Davangere District.

106 Aswathnarayanachar Suradenapura, Hessarghatta Hobli, Bangalore North, Bangalore Urban District.

107 Bheemashankera Sharanappa Ganamukha, Nellur Village, Afzalpur Taluk, Gulbarga District.

108 Channabasappa Yellappa Kambara, Thambura Hunchinala Gram, Kundgol Taluk, Dharwad District.

109 Channaial, S/o Gaggaraiah Javagal Hobli, Arsikere Taluk, Hassan District.

110 Chapala Sharabaiah, S/o Hampaiah Daroji Village, Sandur Taluk, Bellary District.

111 Edigara Venkatesh, S/o Anjanappa Yeragudi Village, Bellary Taluk & District.

112 Ghouse Sab Imamsab Kolagi Chigalli, Mudgol Taluk, Uttara Kannada District.

113 Hanumanthappa, S/o Anjanappa, Kottagudda Village, Pavagada Taluk, Tumkur District.

114 Hanumanthappa, S/o Channappa K. Oblapura, H. B. Halli Taluk, Bellary District.

115 K. G. Kariyappa, S/o Baramappa, Angodu, Jagalur Taluk, Davangere District.

116 Kalegowda Adopted son of Srikantaiah, Channaianahalli, Ganse Hobli, Arsikere Taluk, Hassan District.

117 Kosgi Basavaraj, S/o Late Bheemanna Kurugod Village, Bellary Taluk & District.

118 Kurubara Chandrappa, S/o Marisidappa, Kurugodu, Bellary District.

119 Madivalappa Nagappa, Pareeva Seemikeri, Bagalkote Taluk & District.

120 Mahantappa, S/o Amarappa Kanasavi Village, Mudagal Police Station, Lingasugur Taluk, Raichur District.

121 Mayanna, S/o Byranna Ballagere Village, Nelamangala Taluk, Bangalore Rural District.

122 Muddukrishna, S/o Puttaiah, Beekanahalli, Chickamagalur District.

123 Muniswmi Reddy, S/o Venkatashamappa, Ammanallur, Vemgal Hobli, Kolar Taluk & District.

124 Ningappa Basappa Hireganavar, Javoor, Navalgund Taluk, Dharwad District.

125 Ningappa, S/o Shanmukappa, Andralu, Jewargi Taluk, Gulbarga District.

126 Sahadev Govindappa Dange Tathvanigi, Haliyal Taluk, Uttara Kannada District.

127 Sahadev Shivappa Lamani Arasanagere, Mundogol Taluk, Uttara Kannada District.

128 Sanjeevappa, S/o Bheemappa, Dhasapura, Siruguppa Taluk, Bellary District.

129 Seenappa, Ranganathapura Village, Vijayapura Hobli, Devanahalli Taluk, Bangalore Rural District.

130 Shivalingappa Basalingappa, Handala, Hirehonnehalli, Kalaghatki Taluk, Dharwad District.

131 Shivamanjappa, S/o Mahadevappa, Poojar Dalawai Village, Dharwad Taluk & District.

132 Shivanna, S/o Myiaraiah Kotte, Banavara Hobli Arsikere Taluk, Hassan District.

133 Shivappa Shetty, Thodla Bakibettu Nivasi, Kolnadu Village, Bantwala Taluk, Dakshina Kannada District.

134 Thammanna Shamarayappa Hanasi, Navalur, Dharwad Taluk & District.

135 Thimsetty, S/o Rangasetty Nagaralu, Kadur Taluk, Chikamagalur District.

(Veeresh, 2002)

TABLE 4.18

Particulars of Suicide Cases and Relief Provided in Karnataka

Sl. No.	*Name & Address of Deceased Farmer*	*Date of Suicide*	*Date of Payment of Relief*	*Amount of Relief (Rs.)*
1	Shanabina Gundi Kadur Taluk, Chikkamagalore	23.03.98	30.09.99	One Lakh
2	Basappa Sharanappa Hosalli Kastagi, Koppal	10.03.98	Under Investigation	
3.	Honnura Saba Husena Sab Kanakagiri Gangavathi	14.06.98	Under Investigation	
4	Shivappa Sannappa Bhajathri Halahalli, Koppal	18.04.98	Under Investigation	
5.	K.Gandhi Venkatareddaiah Singanala Gangavathi	30.07.98	Under Investigation	
6.	Channabasappa Gurubasappa Koppal	03.02.01	18.02.01	One lakh
7.	Veerabhadrappa Narasappa Kurubara, Niyasapura, Sindanoor, Raichur	15.08.98	Widow Pension sanctioned	Widow Pension
8.	Erappa Thimmappa Dhangayathi Sindanoor	23.03.98	Widow Pension sanctioned	Widow Pension
9.	Mallamma Shivana Gowda Ragayath Arahalli, Sindanoor	28.08.98	Cause of death found different	Decided as ineligible for compensation
10.	Thayappa HanumatjaHansaihalaHuda Village, Raichur.	28.08.98	Cause of death found different	Decided as ineligible for compensation
11.	Mallana Gowda Shivana Gowda Shivareddy, Thuvinahal, Sindanoor	24.01.98	Widow Pension sanctioned	Widow Pension
12	K.Venkalarao Vadual Balagannor, Sindanoor	24.04.98	Under investigation	
13.	Mabusab Hasenasab Kunnatagi, Sindanoor	15.05.98	Widow Pension sanctioned	Widow Pension
14.	Amatjappa Nagappa Chalavadi, Lagavaravi, Sindanoor	09.06.98	Widow Pension sanctioned	Widow Pension
15.	H.N. Basavaraj Honnali, Tiptur	11.11.01	Cause of death found different	Decided as ineligible for compensation
16.	Hanumanthappa N. Anjanappa Kulagudda Kundagola	24.02.01	Cause of death found different	10,000
17.	Yellappa Adavappa Gundakal, Katapatti Village Kundagola	16.03.98	Cause of death found different	Decided as ineligible for compensation
18.	Basavana Gowda Parigouda Patil, Nagarahalli, Hubli	17.04.98	Cause of death found different	Decided as ineligible for compensation
19.	Kallappa Gangappa Managra Bandavada, Hubli	03.06.98	Cause of death found different	Decided as ineligible for compensation
20.	Gundigappa Purathappa Masothi, Navalur, Dharwad	09.01.01	16.01.01	10,000
21	Mahadevappa Baramappa Bavi Village, Navalur, Dharwad	09.01.01	16.01.01	10,000
22	Basaiah Eraiah Mooka Shiovaiahanavar, Sathaghatta, Hubli.	18.01.01	20.01.01	10,000
23.	Ningappa Basappa Hiranaiahnavara, Javoora Village, Navalagunda Taluk	15.02.01	17.02.01	10,000

24.	Channaiah Sadashiaiah Hiremath, Kundagol	22.02.01	24.02.01	10,000
25.	Kalapa Adivappa Siraguppa, Jogura, Dharwad	10.03.01	Cause of death is personal	Decided as ineligible for compensation
26.	Shivalingappa Basalingappa, Antala, Hirehonnahalli, Kalaghatagi	13.03.01	Under investigation	
27.	Vithal Sharanappa Vhowgal, Kalagiri, Dharwad	16.03.01	Under investigation	
28.	Sri Gopal Reddy N. Thimma Reddy	12.12.99	Under investigation	
29.	Harish N. Thirthappa	10.01.00	Under investigation	
30	Sri Aswathanarayansachari Hesaraghatta, Suradevanapura Bangalore North			
31.	Nagappa Kalavewerappa Muthimaui, Kamoor Village Byadagi Taluk, Haveri	10.02.01	Under investigation	10,000
32.	Veerabhadrappa H. Abbigere Madhugunaki, Naragunda, Gadag	01.03.98		10,000
33.	Basavaraj S. Mudhol Nidagundi, Ron Taluk	19.03.98	Cause of death is non-agricultural	Decided as ineligible for compensation
34.	Basapa Aradkera, Banahal Ron Taluk	17.02.01		10,000
35.	Subbanna Nagappa, Tumakunta, Chincholi Taluk, Gulbarga	13.03.98	19.03.98	10,000
36.	Bheemaraya S/o Kallappa Baiundagi, Jevargi Taluk, Gulbarga	21.03.98	04.05.98	10,000
37.	Veerabhadraiah. S/o Sharanappa, Hoovinahalli, Chincholi Taluk, Gulbarga,			
38.	Chandrappa Mallappa Gavanahalli, Chimmajoda, Chincholi Taluk, Gulbarga	05.05.98	Cause of death is non-agricultural	Decided as ineligible for compensation
39	Veerappa Hanumanthappa Hugar, Karaka Mukali Chincholi Talukm Gulbarga	24.04.98	Cause of death is non-agricultural	Decided as ineligible for compensation
40.	Chand Sab Nandalal Sab Mannur, Afzalpur Taluk	12.05.98		10,000
41.	Shivabasappa Ningappa Pathsetti, Sagar, Shahapur	11.05.98	24.06.98	10,000
42.	Vikram Bojappa Pujari, Munira Bommanashali Surpur	11.05.98	24.06.98	10,000
43.	Mallappa S/o Chandrappa Mulahalli, Shahapur Taluk	07.05.98	24.06.98	10,000
44.	Sabappa Basappa Malagathi, Malagathi, Surpur Taluk	18.05.98	24.06.98	10,000
45.	Adappa, S/o Amarappa Kambavi, Surpur Taluk	24.06.98	24.06.98	10,000
46	Sathappa Sonna, Afzalpur Taluk	10.04.98	Cause of death is non-agricultural	Decided as ineligible for compensation
47.	Munna Singh S/o Bikku Singh Diggi, Shahapur Taluk	02.02.01	27.02.01	10,000
48.	Shivaraj, S/o Revanappa Siddeswara, Bhalki Taluk, Bidar	12.12.97	04.04.98	10,000

49.	Prabhu, S/o Veerabhadrappa Kasarathugaon, Bhalki, Bidar	12.12.98	04.04.99	10,000
50.	Smt. Lakshmibai W/o Eknath Suladabaka. Basvakalyam, Bidar	15.02.98	04.04.99	10,000
51.	Smt. Jeejabai W/o Sreenath Rao, Marambi, Bhalki, Bidar	06.02.98	20.05.98	10,000
52.	Dhanraj, S/o Veerasangappa Ladham Bhalki Bidar	20.03.98	20.05.98	10,000
53.	Bheema Rao S/o Shivappa Patni, Malakhed Taluk	23.03.98	20.05.98	10,000
54.	Vamana Rao, S/o Appa Rao, Ghata Bhorala, Humnabad	16.02.98	20.05.98	10,000
55.	Pandarianath S/o Earaba Hajanal, Bhalki Taluk	24.02.98	20.05.98	10,000
56.	Bharath, S/o Shankarappa Jalahalli, Bhilki	D 09.02.98	20.05.98	10,000
57.	Basavaraj S/o Shama Rao Dondi, Bidar Taluk	16.07.98		10,000
58	K. Yashodamma W/o Late Ajjappa, Sokka Jagalur Taluk Davangere	21.02.01		

Remedial Measures by Karnataka Government

Several relief measures are already available in the schemes sponsored by both the Government of India and the State Governments. They include the Calamity Relief Fund, National Family Benefit Scheme, Raitha Sanjeevani Scheme, Pledge Loan Scheme, Rashtriya Krishi Bhima Yojana, Minimum Support Price, and 'Sankata Harana' scheme implemented by the IFFCO.

Many insurance schemes are available for both farmers and public. All these schemes are guided by the policies applicable in general to any insured persons. Some of the insurance schemes like (i) Janatha Rural Personal Accident Insurance, (ii) Rajarajeswari Mahila Kalyana Insurance, (iii) Bhagyashree Female Child Kalyana Yojane, (iv) Insurance for Agriculture Pump-sets, (v) Horticulture/ Plantation/ Floriculture/ Flower Insurance Scheme, (vi) Insurance on Livestock, (vii) Insurance on Poultry, (viii) Insurance on Carts, and (ix) Standard Kisan Package Policy have all been offered by the Oriental Insurance Company which directly or indirectly aims at covering the farmers and their families.

The New India Assurance Company also has (i) Gram Arogya Yojana, (ii) Insurance on Livestock, (iii) Insurance on Poultry, (iv) Insurance on Krishi Pump-sets, and (v) Janatha Rural Personal Accidental Insurance, offering some competitive premium ranges. The Life Insurance Corporation of India has Janashree Bima Yojana. (Veeresh 2002)

The Crop Insurance Scheme jointly implemented by the State Government and the General Insurance Company has run into problems, with the company withholding disbursement alleging 'fraud' in a sizeable number of claims. The Karnataka government has taken strong objection to this, since several of the so-called cases of fraud are in fact quite genuine. Because of the failure of rains, many farmers changed their crops from paddy to maize midway through the season; and these changes were not reflected in the records. The government has asked GIC to go ahead and release insurance payments for 40,000 claims over which there is no disagreement, and that the remaining claims could be verified again. (Menon 2003)

Had crop insurance payments in the six districts of Haveri, Tumkur, Belgaum, Hassan, Shimoga and Gadag been made on schedule, it would have provided much needed relief to farmers in extreme distress.

To take on the problem of usury in the countryside, the Karnataka government issued an ordinance – the Karnataka Prohibition of Charging Exorbitant Interest Ordinance 2003. This Ordinance bans usury and makes illegal the charging of an interest rate above 23 per cent. In the case of unsecured loan and 21 per cent in the case of secured loan, it is the registered moneylenders who, if at all, are likely to be affected by this ordinance. Most of the private financiers are landlords who are not registered moneylenders and do not enter into any written agreements with their creditors. So, this measure is unlikely to have much impact on usury.

The Karnataka government has taken action to control the suicide rate by announcing a set of relief measures, which however have not been so far successful. One of the measures is the compensation of Rs. one lakh for the next of the kin of suicide victims. Of the nearly 400 cases of suicide by farmers between April 1 and October 20 during 2003, only 220 were placed before the official committee appointed in the districts to decide upon 'genuine claims'. Of these, more than half have been rejected as ineligible for compensation. Of the 'genuine' cases, only 33 families actually have received money.

The parametres set by the government for the compensation are so rigid that it is not surprising that most cases do not qualify for the compensation. The guideline unambiguously says that the farmer must have committed suicide owing to his inability to repay her loan from a bank or any other recognized credit institution by the government. It is obvious that farmers are committing suicide owing to their inability to repay loans to private moneylenders and not government institutions. The unwillingness of the State Government to recognize this reality had failed the compensation process in the state.

Rashtriya Krishi Bima Yojana (RKBY)

The Comprehensive Corp Insurance Scheme has been implemented in the state since 1985 until Kharif 1999. Subsequently, the Government of India introduced a new scheme of National Agricultural Insurance Scheme (also called Rashtriya Krishi Bima Yojana) during 1999-2000 Rabi. However, the state implemented the scheme from Kharif 2000. The main objectives of the scheme are to provide insurance coverage and financial support to farmers in the event of failure of any of the notified crops as a result of natural calamities, pests and diseases and to encourage farmers to adopt progressive farming practices, with high value inputs and improved technology, besides stabilizing farming income, particularly in the disaster years.

Minimum Support Price

The Minimum Support Price is one of the important mechanisms developed and implemented jointly by the Central and State Governments over years to avoid distress sale of agricultural produces. This scheme is implemented for mandated crops like paddy, jowar, maize, bajra, tur dal, greengram, blackgram,

soyabean, groundnut, sunflower, safflower, bengalgram and cotton. However, in Karnataka market intervention scheme for potato, onion, etc. is in operation. Likewise, floor price scheme for selected commodities like tur dal, copra, etc. is also being implemented.

Sankata Harana

Sankata Harana is a noval scheme introduced by IFFCO during 2001-02. Under this scheme, any farmer purchasing fertilizers through cooperative societies would qualify for relief for accidental death.

Personal Accident Insurance Scheme (PAIS) for KCC Holders

Personal Accident Insurance Scheme covers Kisan Credit Card Holders. The United India Insurance Company Limited is the nodal agency for implementation of this scheme in Karnataka State. The progress achieved, as on December 2001, is 249,704 persons with a premium of 71.61 lakhs.

It is better to identify heavily indebted families and provide them relief over a period. It is sad that the gramsabhas in Karnataka have not been strengthened by the state by framing appropriate laws and rules, so that what is ensured in the constitution is actually given to the Gram Sabhas and Panchayats.

Section 58 of the Karnataka Panchayat Act 1933 says: "The Gram Panchayat may also make provisions for carrying out within the panchayat area and other work or measure, which is likely to promote the health, safety, comfort, social and economic well-being of the inhabitants of the panchayat area." How can the panchayats do this, when every department of the state government wants to hold on to their powers for themselves without delegating to the panchayats?

The All India Rural Credit Survey pointed out, decades back, the dangers of financing the land related activities by moneylenders. It is high time that the state acts tough on village moneylenders, both licensed and unlicensed.[64]

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Kulkarni, Manu N. 2003, "Saving Farmer's Lives," Deccan Herald (Bangalore), 23 September 2003.

3. The Maharashtra Scenario on Farmers Suicides

Farmers in Yavatmal District in Vidhrabha, for the last few years, are facing problem of cotton failure despite favourable climatic conditions and uninterrupted supply of inputs. The yields have drastically decreased from a quintal to few kilograms per acre over these years.

The crisis is very severe and farmers are struggling for survival in the wake of failure of not only cotton but also other important crop seeds such as *toor* (pulses) etc. Till 1992, majority of farmers were cultivating basic normal hybrid (AHH 468) of cotton which was fairly consistent and provided normal yield. The problem in this region started since 1992, when a new variety of cotton (CAHH 468), was introduced to the farmers in the region. The farmers spotted that the new hybrid, which has not been certified by the government, failed to perform well inspite of all the care taken by them. As reported by the farmers, the yield registered was almost negligible in subsequent years. These seeds were supplied by some of the trusted seed companies to the farmers for years together. Some of these include Nath Seeds Co., Aurangabad, Ajith Seeds Co., Jalna, and Sanjay Seeds Co., Jalna in this region. The government outlets for selling seeds are supplying sub-standard seeds to the farmers. Some farmers have brought this to the notice of the authorities of these seed companies. For instance, *karadi* (Bhima) seed (marketed by Mahabeej, Akola) which have been duly certified by certifying agency were found to be sub-standard.

Cotton and *toor* are commonly inter-cropped. The farmers found that not only cotton but also seeds of other crops such as *toor* failed to perform.

> On Maharashtra, the people were growing millets, but agriculture departments working as extension workers for seed corporations advised them to stop growing millets and to start growing soya. Because they would get more money. They went in for soya. The farmers when growing millets were getting foliage that helped them to keep cattle, which produced dung to make the compost, which in turn, went back to the farmers' fields. Now when soya came to the market, the soya oil went to some factory, the soya cake was exported to USA for feeding pigs; the cattle had nothing to eat, the soil had no dung. It started to lose its fertility. The cycle started to work in the wrong way. The need of the hour is to look into the soil aspect of the farms. The concept of soil aeration is of utmost importance. Soil areation is not taken into account by the western education. We forget about the air. The earthworm is one such type of organism that helps in soil aeration. GM crops endanger the soil component and the concept of living soil will vanish in the course of time if such crops are allowed. The need of the integrated approach to organic farming where the whole cycle of life is again rejuvenated.
>
> ***- Dr. Sultan Ismail,*** *leading earthworm ecologist*

> **82 Maharashtra farmers committed suicide this year**
>
> As many as 82 farmers from Vidarbha and Marathwada regions of Maharashtra had committed suicide during the year after being overburdened by debts, The Revenue Minister, Mr. Narayan Rane told the Maharashtra Legislative Council today. The State Government had given financial assistance to 25 farmers.
>
> ***The Hindu, New Delhi, 21.07.1998***

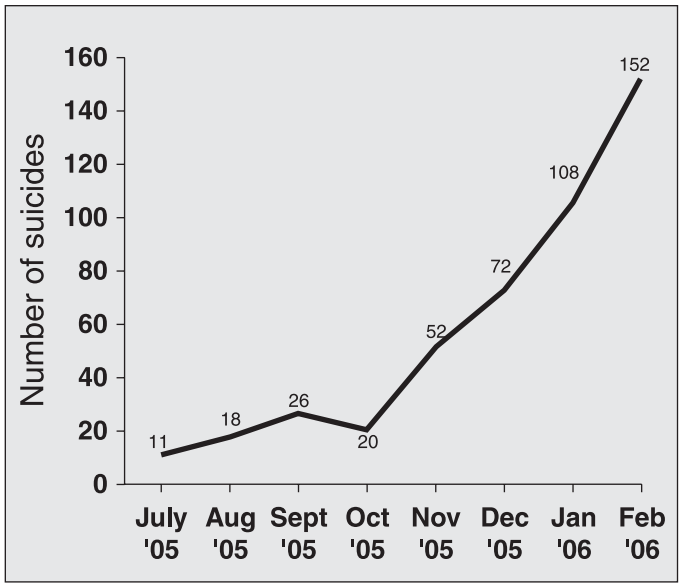
Farmers Suicides in Vidharbha

During June 2005 and March 2006 more than 371 farmers committed suicide due to failure of Bt cotton in Vidharbha (Deshpande 2006). The number increased to more than 413 by mid of April, 2006 and more than 446 by the end of third week of April 2006 (Joshi 2006). The names of 250 victims are

Deshpande, Vivek 2005, "No Personal Reason Behind Cotton Farmers Suicides", 25 Nov., 2005, Indian Express, New Delhi.

Joshi, Sharad, 2006, "Farmers Bear the Cross" Business Line, 21 April, 2006, New Delhi.

Graph vi Phenomenal Increase in Farmers Suicide in Vidharbha



(Mishra 2006)

listed in the Appendix 1. **Graph vi**, shows the alarming increase in the number of suicides.

Farmers suicide in Vidharbha first recorded in 1997 and have continued unabated since then. While, the government admits to over 1000 suicides, however a study by Tata Institute of Social Sciences (TISS) Bombay pegs the number at over 3000.

Successive State governments have blamed the suicides on private moneylenders. But, it seems, that it was the withdrawal of a bank guarantee by the government in 1996 that drove farmers to moneylenders in the first place.

In Maharashtra, the Maharashtra State Cooperative Agriculture Rural and Multipurpose Development Bank (MASCARDB) offered long-term credit, while district (LDBs) (funded by MASCARDB) offered short and medium-term credit.

MASCARDB had been lending up to Rs 200 crore until 1996-97. Of this, up to Rs 190 crore came from National Bank for Agriculture and Rural Development (NABARD) under a State government guarantee. Till the guarantee existed, MASCARDB remained well funded by NABARD and there were no suicides. The farmers fared well with organized loans at 7 to 13 per cent interest over 15-years periods.

But in 1996, the government decided to block the guarantee, turning off NABARD funding. By November 2002, MASCARDB ran out of resources and was set up for liquidation.

It is significant that the highest suicides rates are recorded in the districts where LDBs are up for the liquidation or are doing badly. In April 2004, the new central government declared that agriculture was its focus and gave NABARD Rs 39,000 crore to disburse. MASCARDB could have got a lion's share, but lack of a State government guarantee to NABARD means that it can give the state farmers nothing.

On the method of committing suicides, the report by Indira Gandhi Institute of Development Research, Bombay says that 79.3% chose to consume poisonous substance such as insecticides / pesticides; 12.6% hanged themselves, 4.5% committed self immolation and 3.6% drowned. Medical aid could not reach on time since hospitals that can treat emergencies like poisoning are on average 20 kms away. (Marpakwar 2005)

TABLE 4.19
Decreasing Loan Disbursement in Maharashtra

Year	*Loan (Rupees in Crores)*
1994 – 1995	136.62
1995 – 1996	146.89
1996 – 1997	165.77
1997 – 1998	100.54
1998 – 1999	39.62
1999 – 2000	5.09
2000 – 2001	9.48
2001 – 2002	0.07
2002 – 2003	0.00
2004 – 2005	0.00

(Marpakwar 2005)

Mishra, Saurav, 2006, "Long Yarn", Down To Earth, Centre for Science and Environment, 31 March, 2006, New Delhi.

Marpakwar, Prafulla 2005, "It is Official: Debt Driving Cotton Farmers to Suicides," 14 Nov., 2005, Times of India, New Delhi.

With the poor yields of around of three quintals from one acre of land, return are hardly enough for the year long needs of the farmers, leave alone the mounting dues from the unsparing and ruthless moneylenders. (Bunsha 2006)

This year has been the worst for Vidharbha's farmers since the first farmer's suicide seven years ago. In 2004, upto 80% of cotton growers harvested Bt cotton. When Nana Patekar, the brand ambassador of Monsanto, toured Vidharbha to promote Bt, his public meetings had a huge impact. Farmers went for Bt cotton in a big way. But it Boomeranged badly. (Faleiro 2005)

Repeated crop failures, failure of institutionalized system of loan, poor extension services, unfavourable cost-benefit ratio of the crop and absence of the government intervention are some of the major factor for the suicides in Vidharbha. There is also a temptation among small and marginal farmers, particularly the young, towards high risk commercial crops to improve their lot. The government of Maharashtra is trying to wean small and marginal farmers from the temptation to grow high risk commercial crops.

Dimensions of the Crisis in Vidharbha

(i) Four villages – Shingnapur, Dorli, Lehegaon and Shivni Rasulpur – are "up for sale".
(ii) Distressed farmers set up "kidney sale centers" in many villages.
(iii) Cotton price has dipped from Rs. 2,500 a quintal in 1991 to Rs. 1785 at present.
(iv) Government reduces procurement price this year by Rs. 500.
(v) Procurement this season : 6.25 lakh quintals; last season: 185 lakh quintals.
(vi) Number of procurement centers this year : 160; last year: 410.
(vii) Only 11 percent of the land in the region is irrigated.

(Bunsha 2006)

The trauma for families of farmers, who took their life because of extreme debt, does not end here. Compensation norms, harassment by moneylenders and Banks and the struggle to survive makes life even worse for them. Government norms only compensate families if loans are borrowed from Banks and if the victim is the landholder, and the victim should have received reminders from the Bank regarding repayment. However, only six to seven percent of farmers get credit from the organized sector. (Maitra 2005)

Though there is the Bombay Moneylenders Act, 1947. Neither it has been revised, nor it is enforced effectively.

Following are some of the lacunae in the Act.

- The law does not allow moneylenders to keep land as guarantee, a condition violated with impunity.
- Moneylenders need to inform the government their 'loan target' for the year. There is no power to take any punitive action.

The reason that these loan sharks seen blood is because cooperatives have been crumbling. When the government announced in all Gram Sabhas that no farmer should pay back to sahukars, there was a backlash. The farmers were angry at the administration and said who will give them money for crops.

Bunsha, Dionne 2006, "Villages for Sale in Vidharbha," 24th March 2006, Frontline, Chennai.

Falerio, Sonia 2005, "Death Along the Farmished Road", 17 Dec. 2005, Tehelka, New Delhi.

Maitra, Pradeep Kumar 2005, "Police Pressure Feeds Cotton Crisis", 20 Nov., 2005, Hindustan Times, Bombay.

Women Farmers Too in Debt

Farmer suicides in Vidharbha has become an epidemic. It is not just male cotton farmers who are driven to taking the extreme steps. There are atleast 5 women farmers who have committed suicide due to failure of Bt Cotton on Diwali, Meera Chavan of Ambejhari village became the first woman to commit suicide in Yavatmal district. The reason is the same one that drives other farmers to kill themselves, the spiraling cycle of crop failure and mounting debts. Ambejahari village is a picture of distress caused by a four long drought. Local warns of more suicides.

Debts the result of high cultivation cash and low returns and a faulty credit policy have taken a heavy toll on the state's cotton growers. As mentioned earlier during a short span more than 446 farmers have committed suicides.

Growing Indebtedness; Villages for Sale

The distress sale of villages, first was confined to the frontline agricultural State of Punjab. But now the ultimate symbol of growing rural despair – putting villages up for sale – has spread to Vidharbha. Residents of Shingnapur and other villages such as Dorli, Lehegaon, Shivni Rasulpur have adopted a novel way of high lighting their plight by declaring that their village is up for sale. The villagers in Shingnapur have threatened to sell their kidneys. They have invited the Prime Minister and the residents to inaugrate the kidney sell centre. (Bhagwat 2006)

Major Factors Behind Farmers Suicides. No case of suicide is reported due to failure of Bt cotton in Nimad however, in Vidharbha following are some of the factor responsible for the farmers suicides.

Cultivation Cost Hike

Over the last decade, the cultivation costs have increased 10 times whereas the purchase price has less than doubled in the same period. Private traders, who were allowed to enter the market in 2002, pushed prices down.

Lack of Irrigation

The cotton crop in Vidarbha and Marathwada mostly depends on seasonal rains. The absence of major irrigational facilities rules out a second crop.

Credit Trap

Of late, Banks have been refusing loans to farmers who have problems buying seeds, fertilizers and in hiring labour. Here private lenders come into picture. They charge exorbitant interest rates and often buy the yield at lower rates to recover their money.

Monopoly Scheme

The cotton trade was in private hands and farmers did not get a fair price for their produce. Hence, the government launched Cotton Monopoly Scheme in

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Bhagwat, Ramu 2006, "Farmers to Sell Kidneys to Raise Capital", 23rd Jan., 2006, Times of India, New Delhi.

1971. The scheme ran up losses of about Rs. 6,000 crore. The locally produced cotton was not in demand because textiles mills preferred the cheap imported cotton.

Down turn : Falling Global Cotton Prices

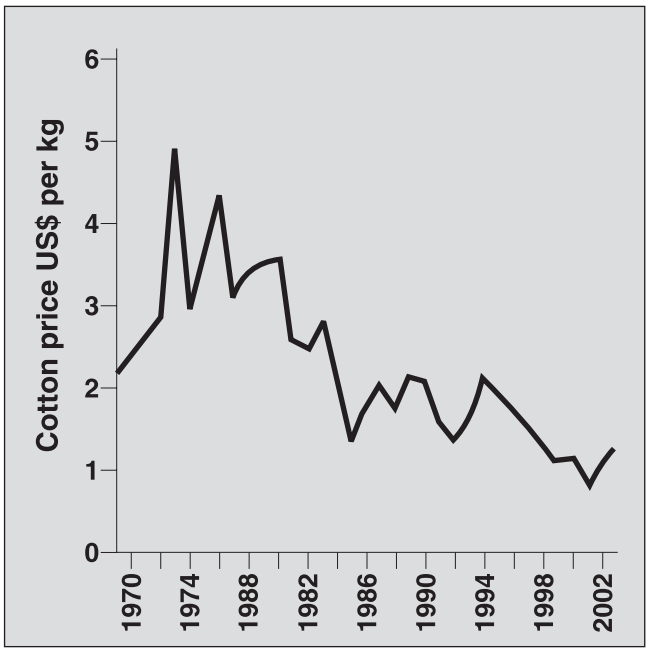
More than 70 countries globally produce and export cotton. Of these, eight countries are responsible for almost 80 per cent of global output. The world's cotton market is dominated by the US – which is the second largest producer. Support to the cotton sector is greatest in the US, followed by China and the EU. The combined support (domestic and export subsidy) provided by the US government to cotton producers is pegged at $ 4 billion. China provides $1.5 billion, while the EU's support of $900 million is mainly for Spain and Greece. Subsidy encourages surplus production and deflation of prices. As shown by **graph vii** international prices have decreased continuously over the last 30 years when the US started its aggressive subsidy programme, through funding storage in 1985 and price support in 1996. (Mishra 2006)

In this century, the US has gone a step further, US cotton imports are now covered by the Step-3 Farm Policy of 2002, which allows imports of specified quantities for specific periods of time, thus protecting domestic production. The US subsidy system is based on direct payments to farmers who can sell cotton in world markets at prices well below the cost of production. Production costs are $1.70 per kg but its cotton is sold at $1.18 per kg. Export subsidies for 2005-2006 amount to $360 million. The same goes for the EU subsidy. Its support programme began in 1981 when Greece and Spain joined EU's common Agricultural Policy. Together, Spain and Greece accounted for 2.5 per cent of world production and 6 per cent of world exports in 2001, but they account for 16 per cent of world cotton subsidies. (Mishra 2006)

The worst losers are farmers in the least developed countries (LDC). This subsidy is helping only a few thousand farmers in the developed nations but is putting millions of poor Africans into a death trap. For example the $4-billion subsidy that the US gives is only meant for 20,000 farmers who cultivate cotton. The fact that many countries in West and Central Africa are heavily dependent on cotton exports makes the situation worse. In Burkina Faso, Chad, Mali and Togo, cotton accounts for two-thirds of agricultural exports and one third of the total exports, meaning many livelihood depend on growing cotton. In many non-African countries too, cotton is a major source of export revenue. In Uzbekistan, Tajiskitan and Turkenistan, it accounts for 45, 20 and 15 percent of total commodity exports.

At the individual level, a fall in prices means attrition of incomes that are already, in

Graph vii Falling Global Cotton Price



(Mishra 2006)

Import of Cotton in India

Year	*Cotton Bales in Lacs*
1998-99	7.87
1999-2000	22.01
2000-2001	22.13
2001-2002	24.17
2002-2003	20.00
2003-2004	15.00

(Jawandhia 2006)

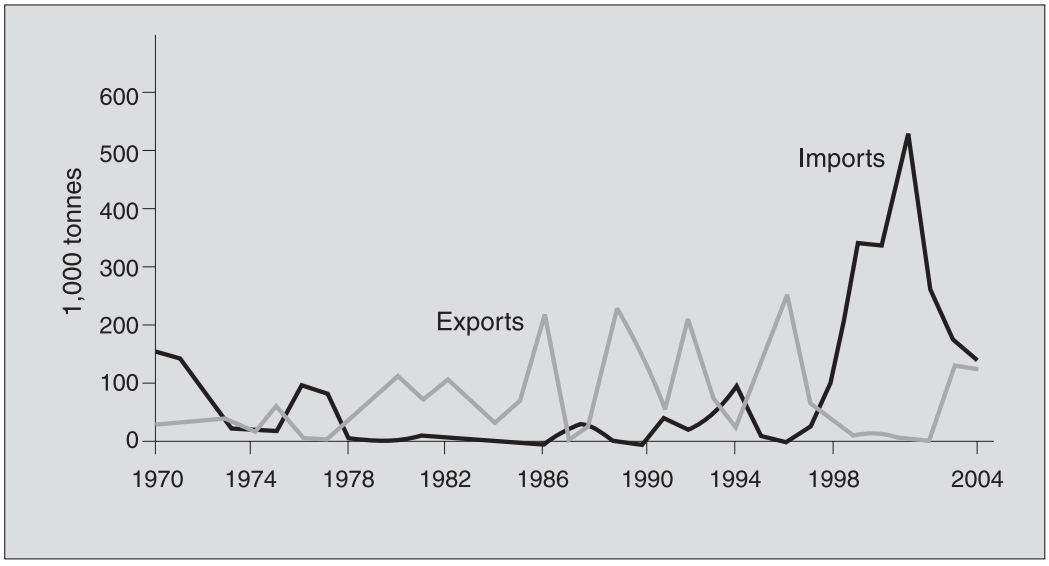
many cases, close to subsistence level. At the macro level, it means that adverse terms of the trade reduce the revenues of government in these countries and therefore their capacity to put in place programmes for livelihood security.

Increasing Import and Decreasing Export of Cotton

The first decade of WTO has been disappointing to Indian farmers. Since last ten years, prices of major agriculture produce i.e. wheat, rice, cotton, edible oil and sugar have fallen in the world market. This is because what was promised by Dunkel Draft and Agreement on Agriculture is not fulfilled. Subsidies to the farmers of rich countries have not reduced. Green Box and Blve Boxes are used very cleverly to maintain or increase subsidies. For cotton growers the fact is very serious. Not in very past but in 1989 we exported about 15 lakh bales of cotton. Before 1990 cotton import and export was totally controlled by Central Government. After the formation of WTO in 1995, cotton import and export is free. But we could not export cotton as prices in international market has fallen to one third from what was it was in 1994. The cost of production in America of 1 kg of cotton lint is not less than 1.8$. But it is sold in international market at 1$ per kg of cotton lint. This is why cotton farmers in India are committing suicides. Our import of cotton is explained by following figures. (Jawandhia 2006)

Traditionally, India has been a net cotton exporter. But by 1998, it emerged as a major importer due to policy changes **(graph-viii)**. Imports were liberalized when the Cotton Corporation of India's (CCI's) import monopoly was terminated in 1991. Now imports are subject to the Open General License (OGL), allowing unrestricted imports by private traders.

India : Cotton Imports and Exports 1970-2004 Graph-viii



(Mishra 2006)

Jawandhia, Vijay 2006, "Memorandum Presented to Pascal Lamy, President WTO, on 5th April 2006, Taj Mansingh Hotel, New Delhi.

At an estimate this year the US is supplying more than 40 per cent of Indian imports. This could, however, be an underestimate because it does not include private imports under OGL. "Understanding the Indian and Chinese demands, the US producers are offering cotton at 40 per cent of the Indian production cost. (Mishra 2006)

Cheap US imports are bound to hit Indian farmers. Domestic prices have remained stagnant in the range of Rs. 1,700 to Rs 1,900 over the past 10 years. There is no domestic or export subsidy for cotton in India. The only domestic support available to the cotton farmers is procurement at MSP. However, CCI procures only 10 per cent of the produce rejecting the rest on quality parameters. The rest is procured by other state procurement agencies and private players, usually at prices less than MSP.

KILLING FIELDS

In village after village, the cotton crop has failed this year again and pushed farmers into debt. For instance in Sunna Village of Yavatmal, Subhash Mamdiwar had accumulated a debt of more than Rs. 1.5 lakh; largely from moneylenders at heavy interest rate. He consumed poison on 30th November 2005. Despite assurance from the government official family did not receive any help. In the same village two more people consumed poison; both of them had a bank loan of Rs. 25-30 thousand which they could not return.

The village which has had the maximum number of suicides is close to the Andhra Pradesh border, another state where farmers are killing themselves (FPJ 2006).

Prahalad Kisan Rathod's family has been trying to move on in life after he killed himself in Yavatmal's Tiurang village. Prahalad's wife Baby says their field was once their pride but now brings back memories of death.

"Our crop has failed for four years and credits have piled up. On top of that we have a daughter to marry," she says. It's the same tale in Pangdi, a village

Four More Suicides

Even as Shivni Raslapur and Singnapur villages effectively tackle farmer suicides, four debt-ridden farmers from different parts of Maharashtra killed themselves on Sunday.

In Akola and Washim districts, one farmer each had taken the extreme step, while two farmers committed suicide in Beed district of Marathwada.

Anand Golait (35) a marginal farmer from Tankhed in Akola took his life by jumping in front of a train. In another incident, Vijay Jadhav from Bhendimahala in Washim ended his life by consuming poison, said police.

Triambak Galgatte (60) from Nimgaon Chauba in Beed hanged himself. In Kalsamber Wadgaon, 62-yr-old Nanabhau Karande hanged himself on 8th April. (Maitra 2006)b

8 More Farmers End Life

The spate of farmers suicide rocking the backward regions of Vidarbha and Marathwada shows no sign of abatement with at least eight farmers committing suicide in Beed district in Marathwada region within the last 36 hours.

The preliminary reports suggest that the farmers wee neck-deep in the debt and were unable to repay the loan they had taken from the money lenders and financial institutions.

A large number of farm labourers moved out to Narayanpur and other parts of Western Maharashtra, where there is a lot of sugarcane farming. But when they did not get work there too, some of them ended their lives then and there."

Hundreds of cotton farmers in the Vidarbha region of northeastern Maharashtra have killed themselves because of debts and crop failure, but the government isn't in pain. Vidarbha, once the cotton valley of India, is now a valley of death. (Kanate & FPJ, 2006a)

Maitra, Pradeep Kumar 2006b, "Farmers Mortgage Villages to Stop Suicides" 9th April 2006, Hindustan Times, Bombay.

Kanate, Ganesh 2006, "8 More Farmers Commit Suicides in Beed District" 11th April 2006, DNA Bombay.

FPJ 2006a, "8 More Farmers End Life in Beed," 11 April 2006, Free Press Journal, Bombay.

Three Farmers End Life in West Vidharbha

"Three debt-ridden farmers have committed suicide in west Vidharbha region of Maharashtra. While two debt-ridden farmers died in Akola district, one took the extreme step in Washim district", Police said, reports PTI.

"Raju Mahadeo Pinjarkar (35) of Somwarpeth in Barshi Tehsil town of Akola had set himself of fire on April 9 last and succumbed to injuries at the General Hospital. In another incident, 40 year old Haridas Ramrao Deole of Patur Nandapur village in Akola district has ended life by consuming poison. Hanumant Tukaram Shinde (40), the resident of Kupti village in Washim district also cousumed poison", Police added.

FPJ 2006b

dominated by backward castes, where sixty-year-old Punaji Ramaji jhade became the first farmer to kill himself. He too couldn't pay his creditors.

The spate of farmers suicides rocking Vidharbha shows no sign of abatement. During March 31 and April 10, 2006 about 42 farmers suicides are reported which means 4 suicides in every 24 hours.

The suicide of Jamuna Ramdas Ade, a farmer of the Banjari community, is eloquent testimony to the plight of cotton farmers in Vidarbha. Banjaris have always had the reputation of being resilient however bad the situation seemed, but Jamuna finally succumbed on January 10, 2006, committing suicide by consuming monocrotophos, an insecticide, in Salod Krushanpur, a remote village in Yavatmal district, 178 km from Nagpur.

"She took this extreme step because the local moneylender used to harass her," says Sankar, Jamuna's son. Further questions about the money-lender yielded no answers. Sangeeta, Jamuna's married daughter, was more forthcoming. "We are afraid the moneylender may harass our family," she says. Chanda Masola, a friend of Jamuna, was more explicit. "The local primary school teacher cum sahukar (Moneylender) was asking Jamuna for sexual favours in return for the Rs. 5000 loan, she took six years ago to gorw cotton. He was demanding Rs 50,000 as the total amount owed. Jamuna was humiliated time and again by the moneylender and his goons in public. This ultimately led to her suicide."

Jamuna took to farming seven years ago, when Ramdas, her husband, was paralysed. Increasing input costs and decreasing yields on her 2.8-hectares farm complled Jamuna to approach a Cooperative Bank, but she was denied assistance because Ramdas had taken a Rs 10,000 loan which he had not returned. The total sum owed had increased to Rs 24,000. This led Jamuna to approach the local moneylender, Shyamji, who is one of the increasing tribe of government employees who are turning to moneylending. Jamuna had cultivated cotton on 1.2 ha, investing Rs 22,500. She got 600 kg. At Rs 1,700 per 100 kg this could hardly cover input costs. (Mishra 2006)

FPJ 2006b, "Three Farmers End Life in West Vidharbha" Free Press Journal 22 April 2006, Bombay.

List of the Farmers who committed suicide in (Maharashtra - Vidharbha), During June, 2005 and January (till 16 January) 2006

Appendix – III

June, 2005 total suicides 16

S. No.	*Farmer's Name*	*Date*	*Village*	*Taluka*	*Distt*
1.	Kailash Ragoji Videwar	2 June, 2005	Vidul	Umarkhed	Yavatmal
2.	Bhart Devsingh Ekde	2 June, 2005	Pokhri	Chikhli	Buldhana
3.	Sahebrao Gopal Kapse	2 June, 2005	Selsur	Chikhli	Buldhana
4.	Vashudev Devrao Pote	3 June, 2005	Boregaon Peth		Amrawati
5.	Ganesh Bhimrao Thakre	3 June, 2005	Dahidanda		Akola
6.	Manohar Dhamanrao	4 June, 2005	Dilora	Chandurbazar	Amrawati
7.	Jaipal Bhaurao Kharker	6 June, 2005	Parsodi	Aashti	Vardha
8.	Prahlad Ramrao Nalkande	7 June, 2005	Pathod	Anjangaon	Amrawati
9.	Abhay Shyamrao Chavhan	17 June, 2005	Mulaba	Mahagaon	Yavatmal
10.	Vikram Maruti Rajurkar	20 June, 2005	Kothwala	Barora	Chanderpur
11.	Punaji Nathu Nare	22 June, 2005	Vadona	Dhamangaon	Amarawati
12.	Raju Nanaji Thakre	22 June, 2005	Aashti	Aashti	Vardha
13.	Mahadev Moti Ram Gavande	25 June, 2005	Adharshgram Jhada		Amarawati
14.	Umrao Jaanrao Bavaskar	25 June, 2005	Varuli	Chikhli	Buldhana
15.	Naroli Mahadev Rasse	26 June, 2005	Pisgaon	Naregaon	Yavatmal
16.	Shankar Kondiya Vankhade	29 June, 2005	Mudana	Mahagaon	Yavatmal
	July, 2005 total suicides 11				
17.	Madhukar Kishan Chavhan	9 July, 2005	Dudhan	Khangaon	Buldhana
18.	Vithal Balkishan Bhil	9 July, 2005	Chitotara Ambikapur	Khangaon	Buldhana
19.	Nilkanth Khoke	3 July, 2005	Mangi	Kelapur	Yavatmal
20.	Ramdhan Mansingh Pawar	7 July, 2005	Kathoda	Vasmat	Wasim
21.	Ashok Prateki	13 July, 2005	Nimboli	Dhamangaon	Amarawati
22.	Namdev Kamle	20 July, 2005	Kharoos	Umarkhed	Yavatmal
23.	Sahibrao Jadhav	20 July, 2005	Pofali	Umarkhed	Yavatmal
24.	Ashok Nanaji Thakre	20 July, 2005	Pahapal	Kelapur	Yavatmal
25.	Suresh Bhaurao Chopde	21 July, 2005	Jawla	Aarny	Yavatmal
26.	Raju Mahandu Chormale	26 July, 2005	Januna	Buldhana	Buldhana
27.	Pandurang Shadashiv Devkar	28 July, 2005	Kotari	Nandgaon	Amarawati
	August, 2005 total suicides 18				
28.	Umesh Eknath Kharate	3 Aug, 2005	Boregaon Verale		Akola
29.	Nandkishore Kashinath Gavande	4 Aug, 2005	Nashir	Moreshi	Amarawati
30.	Dilip Jandrao Gavande	9 Aug, 2005	Pimpri	Ner	Yavatmal
31.	Dattabapu Rao Mandalwar	11 Aug, 2005	Hivri	Yavatmal	Yavatmal
32.	Motiram Bhina Atram	11 Aug, 2005	Shivnala	Maregaon	Yavatmal
33.	Sukhlal Jholu Bethekar	11 Aug, 2005	Khandukhed	Chikhaldara	Amarawati

34.	Manikrao Neelkanth Rao Deshmukh	12 Aug, 2005	Ninbha	Chandur Railway	Amarawati
35.	Gajanand Bhimrao Anthore	13 Aug, 2005	Mangrul Navthare	Chinkhli	Buldhana
36.	Namdev Atmaram Pawar	16 Aug, 2005	Bhoregaon (Punji)	Arni	Yavatmal
37.	Bhimrao Viswanath Thaple	19 Aug, 2005	Pimplgaon Baini	Nandgaon	Amarawati
38.	Ganpat Motiram Malve	21 Aug, 2005	Varandali	Dirgas	Yavatmal
39.	Bhimrao Ramkrishan Bundalkar	23 Aug, 2005	Nibkhed		Amarawati
40.	Suryabhan Mahadev Isapure	24 Aug, 2005	Ganeshpur	Warni	Yavatmal
41.	Shri Krishan Cheti	26 Aug, 2005	Boregaon Linga	Ner	Yavatmal
42.	Virendra Babarao Ingole	28 Aug, 2005	Aadgaon (Khurd)	Nandgaon (Khurd)	Amarawati
43.	Uttam Shriram Choudhary	28 Aug, 2005	Hathni	Warwaha	Yavatmal
44.	Narayan Chattraji Dhobe	21 Aug, 2005	Pimpl Khunti	Ralegaon	Yavatmal
45.	Rati Lal Bapurao Rathore	31 Aug, 2005	Bandar	Ralegaon	Yavatmal
	September, 2005 total suicides 26				
46.	Nirvarti Shivaji Rao Tarale	1 Sept., 2005	Yavalapur	Aakot	Akola
47.	Pradeep Nagorao Umah	1 Sept., 2005	Kamlapur	Amarawati	Amarawati
48.	Pradeep Subhas Gayakwad	3 Sept., 2005	Warra Thivla	Amarawati	Amarawati
49.	Dilip Basanta Kankird	3 Sept, 2005	Bavarda	Karanjalad	Washim
50.	Revanand Ramrao Gore	4 Sept, 2005	Khapa		Nagpur
51.	Bhavrao Dulat Shriram	4 Sept, 2005	Bavarda	Aashti	Wardha
52.	Jagannath Maruti Parchi	5 Sept, 2005	Iachori	Yavatmal	Yavatmal
53.	Sakharam Maruti Raut	5 Sept, 2005	Hatholi	Bhanora	Washim
54.	Madhukar Narayan Ladke	5 Sept, 2005	Pitholi	Bhanora	Washim
55.	Shyamrao Martawar	6 Sept, 2005	Sunna	Kelapur	Yavatmal
56.	Santosh Sahib Rao Bhaltilak	7 Sept, 2005	Sanglood	Akola	Akola
57.	Amba Dass Jhabuji Dongre	7 Sept, 2005	Thirakhan	Anajangaon Khurji	Amarawati
58.	Ramkishan Namdev Thakre	9 Sept, 2005	Kumba	Maregaon	Yavatmal
59.	Shantaram Shankar Jhatale	11 Sept, 2005	Donwara	Akola	Akola
60.	Arvind Ganpath Jhadav	12 Sept, 2005	Warjhadi	Yavatmal	Yavatmal
61.	Shambhaji Keshavrao Khandagle	13 Sept, 2005	Kherda Buhak	Karanja	Washim
62.	Sabulal Heeralal Darsibe	13 Sept, 2005	Pimplkhuda	Achalpur	Amarawati
63.	Dhanraj Uttamdesh Pande	14 Sept, 2005	Aadgaon	Thilhara	Akola
64.	Tulsiram Maruti Aaswale	17 Sept, 2005	Kosara	Jhari	Yavatmal
65.	Ram Reddy Yadmalwar	18 Sept, 2005	Patan	Jhari	Yavatmal
66.	Uttam Bhimrao Gunjkar	21 Sept, 2005	Shirpuli	Mahagaon	Yavatmal
67.	Avinash Madhavrao Nimbulkar	24 Sept, 2005	Gramsawli	Fulumri	Washim
68.	Gulab Nanhiji Khorade	24 Sept, 2005	Gramtalegaon		Akola
69.	Godruji Nanuji Rangari	26 Sept, 2005	Nimkhed	Bhaatkuli	Amarawati
70.	Harish Chandra Rathore	29 Sept, 2005	Jambushi	Warshitakli	Akola
71.	Bhikaji Nagoji Chorpagar	29 Sept, 2005	Hatola	Warshitakli	Akola

October, 2005 total suicides 20

72.	Nilkanth Rathore	8 Oct., 2005	Dhanora	Murtazapur	Akola
73.	Gajanand Dulat Pardhekar	9 Oct, 2005	Talegaon (Dashasar)		Amarawati
74.	Tarachand Janglu Ingle	15 Oct, 2005	Lavha	Kalmeshwar	Nagpur
75.	Rajabhau Thakre	18 Oct, 2005	Khirsana (Nishsana)	Nandgaon Khandeswar	Amarawati
76.	Vinod Ramdass Chokde	19 Oct, 2005	Baggi Javra	Chandur Railway	Amarawati
77.	Lokeshwar Keshav Rao Bhoyar	19 Oct, 2005	Koshara	Jhari	Yavatmal
78.	Nilesh Hanumant Tayvade	20 Oct, 2005	Dejarwada	Aarvi	Wardha
79.	Narayan Paprayya Shankurwar	20 Oct, 2005	Patanbori	Kelapur	Yavatmal
80.	Devsingh Vikram Solanki	21 Oct, 2005	Kolara Chikhli		Buldhana
81.	Dinesh Mahadev Uwak	22 Oct, 2005	Mojhar	Ner	Yavatmal
82.	Manoj Laxman Dhote	23 Oct, 2005	Ghatlatki	Chandurbazar	Amarawati
83.	Haribhau Bapurao Chithre	25 Oct, 2005	Savangi	Kalmab	Yavatmal
84.	Bhaliram Bapurao Shailke	25 Oct, 2005	Fulsavangi	Mahagaon	Yavatmal
85.	Subhash Ramji Rathore	25 Oct, 2005	Dedni	Digras	Yavatmal
86.	Nathulal Singh Pawar	25 Oct, 2005	Brahamangaon	Pusand	Yavatmal
87.	Devidas Baliram Udmal	26 Oct, 2005	Shendri	Devli	Wardha
88.	Gyaneshwar Dhansod	28 Oct, 2005	Mogra Dhotra	Chandur Railway	Amarawati
89.	Sahib Rao Ranga Rao Shinde	29 Oct, 2005	Dharmoda	Mahagaon	Yavatmal
90.	Kishore Namdev Gawli	21 Oct, 2005	Kushara	Jhari Jamni	Yavatmal
91.	Kawdu Sakharam Chimpalkar	30 Oct, 2005	Kolgaon	Rajura	Chandrpur

November, 2005 total suicides 42

92.	Ambadas Tekam	9 Nov, 2005	Watfeli	Ner	Yavatmal
93.	Jyotiram Pratap Rathor	9 Nov, 2005	Jamb	Barshitakli	Akola
94.	Arun Shankarrao Pore	2 Nov, 2005	Amarawati	Amarawati	Amarawati
95.	Meerabai Hatti Chavan	2 Nov, 2005	Ambejhari	Ghatji	Buldhana
96.	Sanjay Laxman Bhagmare	3 Nov, 2005	Somthana	Chikhali	Buldhana
97.	Kumari Nita Bhopat	4 Nov, 2005	Ashra	Amarawati	Amarawati
98.	Pardesh Pachakvadu Jata	6 Nov, 2005	Dhandi Tola	Kurkheda	Ghadchiroli
99.	Govind Kishan Kove	7 Nov, 2005	Chikhalwarda	Ghateji	Yavatmal
100.	Baba Nishkanth Banjari	8 Nov, 2005	Mishi	Chimur	Chanderpur
101.	Suresh Appa Shadashiv Appa Akalwar	8 Nov, 2005	Bhabdevi		Washim
102.	Kishan Shaduji Kankde	8 Nov, 2005	Rambakadi	Yavatmal	Yavatmal
103.	Eknath Tulsiram Ghatorkar	9 Nov, 2005	Loni	Risod	Washim
104.	Tulsiram Dulat Sontake	9 Nov, 2005	Kalagvahan	Aakot	Akola
105.	Venkatrao Palwa Devkar	9 Nov, 2005	Dhamangaon	Buldhana	Buldhana
106.	Ramprashad Kaluram Chavan	9 Nov, 2005	Januna	Karnja	Washim
107.	Ramesh Kishandas Rathor	9 Nov, 2005	Bodaghan	Ner	Yavatmal
108.	Sanjay Yadav Jidewar	11 Nov, 2005	Sunna	Kelapur	Yavatmal

109.	Manik Shakaram Deshmukh	12 Nov, 2005	Ambashi	Chikhali	Buldhana
110.	Gajanand Baliram Nabulkar	12 Nov, 2005	Sadargaon	Washim	Washim
111.	Subhas Narayan Sawarkar	14 Nov, 2005	Sirsgaon	Ner	Yavatmal
112.	Dinkar Laxman Chamate	16 Nov, 2005	Rajur	Wani	Yavatmal
113.	Prabhakar Shyam Rao Rishodkar	16 Nov, 2005	Barshi Takli	Barshi Takli	Akola
114.	Namdev Jagobaji Ramdan	16 Nov, 2005	Boregaon (Dhole)	Wardha	Wardha
115.	Suresh alias Banti Ramesh Kamble	17 Nov, 2005	Bakiroad	Yavatmal	Yavatmal
116.	Shankar Dhamodar Khangar	17 Nov, 2005	Pathad	Kalamb	Yavatmal
117.	Bandu Dutta Shirpurkar	17 Nov, 2005	Khadka Tanda	Aarni	Yavatmal
118.	Dilip Madhukar Rao Dike	18 Nov, 2005	Dhabdi	Aarni	Yavatmal
119.	Pandurang Bahurupi	18 Nov, 2005	Karjgaon	Varud	Amarawati
122.	Prahlad Narayan Rao Dattar	19 Nov, 2005	Suphali	Wabulgaon	Yavatmal
123.	Ramesh Shivram Bagde	19 Nov, 2005	Mukandpur	Ner	Yavatmal
124.	Sukhdev Ramkishan Khandare	20 Nov, 2005	Mana	Murtazapur	Akola
125.	Sudam Tukaram Bhoyar	20 Nov, 2005	Isapur	Devli	Wardha
126.	Jaipal Nageshwar Nirgule	21 Nov, 2005	Vidhori (Manori)	Lakhani	Bhandara
127.	Dilip Bhanudas Gawade	21 Nov, 2005	Kashi Khed	Dhamgaon Railway	Amarawati
128.	Ganpat Gangaram Netam	21 Nov, 2005	Shibla	Jhari	Yavatmal
129.	Punji Gyandev Aware	23 Nov, 2005	Hingna Tamaswadi	Akot	Akola
130.	Gopal Supda Bajode	23 Nov, 2005	Mominabad	Nandura	Budhana
131.	Vishwanath Haribhau Solanki	23 Nov, 2005	Piplond		Amarawati
132.	Kishanrao Bhagnaji Devgire	23 Nov, 2005	Achalpur	Achalpur	Amarawati
133.	Raju Namdev Rao Burande	24 Nov, 2005	Gaul	Devli	Wardha
134.	Gajanand Shaligram Taale	24 Nov, 2005	Khamkhed	Balapur	Akola
135.	Vinod Wamanrao Choudhary	25 Nov, 2005	Chinchkhed	Morshi	Amarawati
136.	Pradeep Dattashai Shirpurkar	25 Nov, 2005	Khadka	Ghateji	Yavatmal
137.	Bharat Marutirao Choudhary	27 Nov, 2005	Dahali	Ghateji	Yavatmal
138.	Tarasingh Nago Rathor	28 Nov, 2005	Bodh Bodham	Yavatmal	Yavatmal
139.	Tulsiram Udhav Parchale	28 Nov, 2005	Sonapur	Wani	Yavatmal
140.	Bhimrao Buraji Phuljele	28 Nov, 2005	Kirmiri	Gondpinpri	Chandarpur
141.	Arun Pundlik Lohkhande	28 Nov, 2005	Palashkheda Jamanti	Chichkli	Budhana
142.	Subhas Narayan Rao Mandiwar	30 Nov, 2005	Sunna	Kelapur	Yavatmal
143.	Bhurwa Chandku Surpam	30 Nov, 2005	Dhaba (Mankar)	Kelapur	Yavatmal
144.	Vithal Gopal Wade	30 Nov, 2005	Mandar	Wani	Yavatmal
145.	Firatlal Haria Damahe	30 Nov, 2005	Khambhari	Mohadi	Bhandara
146.	Rupchand Wamanrao Patil	30 Nov, 2005	Wafgaon	Devli	Wardha

December, 2005 total suicides 59

144.	Vithal Gopal Wade	2 Dec, 2005	Mandar	Wani	Yavatmal
145.	Firatlal Haria Damahe	2 Dec, 2005	Khambhari	Mohadi	Bhandara

146.	Rupchand Wamanrao Patil	2 Dec, 2005	Wafgaon	Devli	Wardha
147.	Rajesh Chinduji Jumnake	3 Dec, 2005	Borjai	Kalamb	Yavatmal
148.	Gyaneshwar Khasre	3 Dec, 2005	Mopad	Narkhed	Nagpur
149.	Vijay Sugandraj Thakre	3 Dec, 2005	Mohagaon (Badhade)	Narkhed	Nagpur
150.	Bhagwan Pataria	4 Dec, 2005	Bhulai	Darwaha	Yavatmal
151.	Vinod Govinda Bhosle	4 Dec, 2005	Nadagwahana	Darwaha	Yavatmal
152.	Sheshrao Mahadev Khode	4 Dec, 2005	Kondali	Nagpur	Nagpur
153.	Gyaneshwar Narayan Lahane	4 Dec, 2005	Kalagwahana	Anjangaon Surji	Amarawati
154.	Devidas Trishan Jadhav	4 Dec, 2005	Hathni	Chickhali	Budhana
155.	Mahadev Dashrath Naik	5 Dec, 2005	Shevati Jahangir	Amarawati	Amarawati
156.	Ankush Pandurang Nemade	5 Dec, 2005	Warwant	Nehkar	Budhana
157.	Mahadev Ramaji Ganeshe	5 Dec, 2005	Brahamanwada Thadi	Chandurbazar	Amarawati
158.	Lakhuji Vithal Jamnikh	6 Dec, 2005	Kalashi	Driyapur	Amarawati
159.	Anantram Sampat Raut	6 Dec, 2005	Meshwani	Sadakarjuni	Buldhana
160.	Dinkar Motiram Shakre	6 Dec, 2005	Gaiwadi	Dariyapur	Amarawati
161.	Murli Yaswantha Gedam	7 Dec, 2005	Sakhra	Kelapur	Yavatmal
162.	Gajanand Maruti Shahare	7 Dec, 2005	Pimpalgaon	Kalang	Yavatmal
163.	Smt. Laxmi Bai Mahadev Labde	7 Dec, 2005	Thilori	Dariyapur	Amarawati
164.	Pardeep Sukhdev Dandge	7 Dec, 2005	Gram Nimgaon	Nandura	Bhuldhana
165.	Praful Chapatrao Gote	8 Dec, 2005	Kosurla		Wardha
166.	Narayan Pochana Raginwar	8 Dec, 2005	Ghatji	Ghatji	Yavatmal
167.	Ramesh Rangrao Duff	8 Dec, 2005	Sawangi	Kalamb	Yavatmal
168.	Ganpat Bhauji Chanekar	9 Dec, 2005	Chikmara	Nagmid	Chandarpur
169.	Shivaji Uttam Singne	9 Dec, 2005	Deulgaon	Mahi	Buldhana
170.	Rangrao Nilkant Gopal	9 Dec, 2005	Dhamangaon Railway	Dhamangaon Railway	Amarawati
171.	Saeed Khan Shabeer Khan	10 Dec, 2005	Pathurda	Sangrampur	Buldhana
172.	Devrao Mahadev Rao Pardhekar	10 Dec, 2005	Talegaon Dashasar		Amarawati
173.	Uttam Rao Rambhau Shinde	10 Dec, 2005	Gram Akoli	Aakot	Akola
174.	Mangi Bai Ramrao Jadhav	10 Dec, 2005	Asola (Khurd)	Manora	Washim
175.	Rama Hirba Hingade	10 Dec, 2005	Kupatti	Umarkhed	Yavatmal
176.	Prakash Rama Rathor	11 Dec, 2005	Takli	Umarkhed	Yavatmal
177.	Gopaldevi Das Mankar	11 Dec, 2005	Rajurwadi	Morshi	Amarawati
178.	Devi Das Gulabrao Dabhade	11 Dec, 2005	Shirajgaon Kasba	Chandur Bazar	Amarawati
179.	Govinda Trishan Wagh	11 Dec, 2005	Dhal Sawangi		Buldhana
180.	Ranjan Singh	13 Dec, 2005	Dholkhed	Nandura	Buldhana
181.	Raju Vishwanath Kale	13 Dec, 2005	Telkheda	Dariyapur	Amarawati
182.	Yadav Jairam Narule	13 Dec, 2005	Awalgaon	Bhrampuri	Chandarpur
183.	Gopal Rajaram Durkar	16 Dec, 2005	Maregaon (Bhokre)	Akola	Akola
184.	Jagdish Namdev Rao Deshmukh	16 Dec, 2005	Shimnapur	Nandgaon Khandeshwar	Amarawati

185.	Shivaji Vishwanath Mankar	18 Dec, 2005	Karla	Anjangaon Surji	Amarawati
186.	Vasant Wamanrao Choudhary	18 Dec, 2005	Jhadgaon Chincholi	Dhamangaon Railway	Amarawati
187.	Ambadas Govinda Ingle	18 Dec, 2005	Boregaon Manju	Akola	Akola
188.	Samantdas Potu Dharde	19 Dec, 2005	Jamburtola		Gondia
189.	Ruprao Nathuji Basme	19 Dec, 2005	Nimagvahan	Chandur Railway	Amarawati
190.	Ramesh Gunwant Ghate	19 Dec, 2005	Kajleshwar	Barshitakli	Akola
191.	Bhaskar Pandurang Ingle	20 Dec, 2005	Kawalgaon	Khamgaon	Buldhana
192.	Shankar Suryabhan Waghmare	20 Dec, 2005	Bothbodan	Yavatmal	Yavatmal
193.	Deepak Basant Khatse	21 Dec, 2005	Sawargaon (Kale)	Ner	Yavatmal
194.	Raghunath Kaluji Jadhav	21 Dec, 2005	Kalegaon	Ner	Yavatmal
195.	Neelkanth Chitraji Kivhane	21 Dec, 2005	Godgaon Devi	Wani	Yavatmal
196.	Megshyam Waktuji Thikre	22 Dec, 2005	Pathri	Sawanli	Washim
197.	Naresh Gyanoba Rao Kadu	22 Dec, 2005	Gram Meha	Karnja	Washim
198.	Subhadra Bai Ankush Likhde	22 Dec, 2005	Matargaon	Khamgaon	Buldhana
199.	Sharad Shankar Rao Ukde	23 Dec, 2005	Karanja	Karanja	Washim
200.	Nilesh Ramesh Gawande	23 Dec, 2005	Shivir	Dariyapur	Amarawati
201.	Parshuram Sakharam Bhadulkar	23 Dec, 2005	Mowada	Ghatji	Yavatmal
202.	Shivram Sambha Madavi	23 Dec, 2005	Mowada	Ghatji	Yavatmal
203.	Divakar Renu Aashtikar	24 Dec, 2005	Awalgaong	Bhrampuri	Chandarpur
204.	Revara Hiraman Bhatore	25 Dec, 2005	Badgaon Khurd	Selu	Wardha
205.	Gajanan Pundlik Ganwande	26 Dec, 2005	Daga		Akola
206.	Bhimrao Dhondiba Ade	26 Dec, 2005	Pofal Shivini	Sindkheraja	Buldhana
207.	Rajender Ramrao Telang	27 Dec, 2005	Talegaon Dasashar	Dhamangaon Railway	Amarawati
208.	Santosh Kishan Upase	29 Dec, 2005	Jiwati	Jiwati	Chandarpur
209.	Divakar Jangul Bhesare	29 Dec, 2005	Mahurkuda	Arjuni Maregaon	Godia
210.	Vijay Nilkanth Sable	29 Dec, 2005	Khandala	Aarni	Yavatmal
211.	Subhadra Bai Ankush Likde	29 Dec, 2005	Matargaon (Geru)	Khamgaon	Buldhana
212.	Nilkant Tukaram Tarbhe	30 Dec, 2005	Dhanora	Ralegaon	Yavatmal
213.	Suhas Dinesh Sadashiv Charjan	31 Dec, 2005	Nachangaon	Pulgaon	Wardha
214.	Ganpath Maruti Shinde	31 Dec, 2005	Nimni	Korpana	Chandarpur
215.	Kandhaji Sukhdev Haste	31 Dec, 2005	Jarur	Ghantji	Yavatmal

January (Till Jan. 16) 2006 total suicides 35

216.	Sahibrao Bhimrao Dhankhede	1 Jan, 2006	Dehdi	Tiwasa	Amarawati
217.	Nandkumar Watade	1 Jan, 2006	Hiwara Purna	Achalpur	Amarawati
218.	Chhabutai Shrikrishan Nikhade	1 Jan, 2006	Raweri	Ralegaon	Yavatmal
219.	Madhukar Shriram Shikare	2 Jan, 2006	Pimpalsheda	Manora	Washim
220.	Ramkrishan Sheku Meshram	3 Jan, 2006	Chopan	Korpana	Chandarpur
221.	Mangesh Ambadas Sawla	4 Jan, 2006	Lambkani	Akot	Akola
222.	Bhimrao Nathuji Bofde	4 Jan, 2006	Pusda	Amarawati	Amarawati

223.	Lonkaran Unkadrao Dongre	4 Jan, 2006	Chikhali	Katol	Nagpur
224.	Suresh Pandisnath Nagre	4 Jan, 2006	Wardhi	Sindhkeda Raja	Buldhana
225.	Pandit Raibhan Umbarkar	4 Jan, 2006	Mahesang	Boregaon Manju	Akola
226.	Dayal Ragoji Badkal	4 Jan, 2006	Karanwadi	Maregaon	Yavatmal
227.	Manohar Sampat Pawde	5 Jan, 2006	Thijori	Dariyapur	Amarawati
228.	Rama Namaji Chirsagar	5 Jan, 2006	Gudegaon	Pabani	Bhandara
229.	Baldev Atmaram Warkhede	7 Jan, 2006	Sukli	Barshitakli	Akola
230.	Gajanan Eknath Jabjal	8 Jan, 2006	Salatwada	Murtazapur	Akola
231.	Ramesh Devidas Jadhav	8 Jan, 2006	Khapri (Rudala)	Manora	Washim
232.	Kamlabai Chavan	8 Jan, 2006	Pimpari	Manora	Washim
233.	Devicharan Jagannath Gayakwad	8 Jan, 2006	Warchh Ichhapur	Shegaon	Buldhana
234.	Ramarao Pancham Patil	9 Jan, 2006	Chincholi Kapapatan	Kamthi	Nagpur
235.	Ashok Yashwant Gujar	9 Jan, 2006	Shirjgaon	Dariyapur	Amarawati
236.	Vijaybhau Rao Tekam	2 Jan, 2006	Jodmoha	Kalang	Yavatmal
237.	Kishan Ganpat Ekde	10 Jan, 2006	Pokhri	Buldhana	Buldhana
238.	Sunanda Babarao Ingole	11 Jan, 2006	Thandipawani	Nagpur	Nagpur
239.	Yamuna Ramdas Ade	11 Jan, 2006	Salod Kirshnapur	Yavatmal	Yavatmal
240.	Subhas Shankarrao Shewatkar	13 Jan, 2006	Anjangaon Bari	Badnerao	Amarawati
241.	Babulal Sawliya	13 Jan, 2006	Kusumkot Khurd	Dharni	Amarawati
242.	Mahadev Narkhate	13 Jan, 2006	Sawarla	Pawani	Bhandara
243.	Rambhu Marutrao Shade	14 Jan, 2006	Khohli	Babulgaon	Yavatmal
244.	Ramdas Saduji Patil	16 Jan, 2006	Chincholi Kale	Chandurbazar	Amarawati
245.	Sakharam Kashiram Kukre	16 Jan, 2006	Manora	Manora	Washim
246.	Anandrao Laxman Motghare	16 Jan, 2006	Bakeshwar	Bhiwapur	Nagpur
247.	Dadaram Bhoyer	16 Jan, 2006	Sonegaon Pendri	Lankhdur	Bhandara
248.	Shrirang Suryabhan Meshram	16 Jan, 2006	Ichora	Kalab	Yavatmal
249.	Sheshrao Lalji Rathore	16 Jan, 2006	Warud Jahangir	Ralegaon	Yavatmal
250.	Himant Vishwanath Bharme	16 Jan, 2006	Lohi	Aarni	Yavatmal

Vidharbha Jan Andolan Samiti 2006

4. The Punjab Scenario of Farmers Suicides

Punjab - the highest contributor of grain to the national pool has now got a notorious distinction of having the highest rate of farmers' suicides among all the states. Though the farmers' suicides started in 1990 but in 1997-98 it became very severe and today it has acquired an alarming proportion. It seems it has crossed the suicide rate of Andhra Pradesh and Karnataka. Despite some government agency reports to the contrary, an alarming rise in rural suicides has become an acknowledged fact.

Initially the Punjab government was not ready to acknowledge that the suicides were occurring. But when the media reported the suicides in large numbers then the government formed committees to look into the matter. But unfortunately, these committees failed to pinpoint unremunerative agriculture,

Vidharbha Jan Andolan Samiti, 2006, "Vidharabha Jan Andolan Samiti, 11, Trisharan Nagar, Khamla, Nagpur 25.

increased cost of production and large-scale indebtedness as major reasons for the misery of the farmers and instead concluded that the suicides are taking place due to family problems, intoxication and other social reasons.

The study on 'Suicide in Rural Punjab' conducted by the Institute of Communication and Development, Chandigarh, in 1998, confirmed that there has been a distinct increase in the number of suicides in Punjab since 1998. In 1992-93, the suicides in Punjab increased by 51.97 percent; in 1993-94 there was an increase of 14 percent; in 1994-95 the increase was 57 percent. It notes with concern that suicides rates i.e. the number of suicides per lakh population has been steadily increasing from 0.57 in 1988 to 2.06 in 1997 in Punjab (Suicides in Rural Punjab, 1998).

It has been also observed that the percentage share of cultivator farmers' suicide to the total suicides in Punjab between 1991-97 was to the extent of 23 percent. In Sangrur district the percentage share of cultivator farmers to the total suicides in the district was to the extent of 50 per cent. The suicide rate of cultivator farmers in 1993 was 1.98, which increased to 4.49 by 1997. The study clearly admits that the rate of suicides of cultivator farmers has been on the rise in Punjab since 1993. However, the Chief Minister of Punjab undermine the alarming situation. According to a reply on suicides in Punjab, the State's Chief Minister during June-July Assembly Session in 1998 (Q. No. 1087) had said, "During 1996, 1997 and 1998 there were only 8 suicides of farmers and agricultural labourers in Punjab. One in Tarn-Taran in Amritsar district in 1996 was a result of family dispute. The three in Sangrur were due to crop damage and indebtedness. Three in Bhatinda were because of crop damage and indebtedness and one in Jalandhar due to crop damage by hailstorm".

Sangrur and Bhatinda districts reported the maximum suicides, with suicide rates of 12.08 percent and 6.24 percent respectively. It is also noticed that the share of non-cultivators' suicides in these two districts is also very high as compared with other districts i.e. 13.24 percent and 11.35 per cent respectively. While the district of Mansa, Amritsar, Ferozpur, Gurdaspur, Faridkot and Muktsar has moderate level of suicide proneness during 1991-97. All these districts comprises the cotton-belt of Punjab.

Some analysts acknowledge the suicide phenomena in Punjab but characterise it as a fallout of militancy. Countering this Mr. Inderjeet Singh Jaijee, Convenor of the Movement Against State Repression, said "If this were the case one would expect to find suicides limited to Punjab and that too to certain areas of Punjab such as the border districts. This is not the case. Lehra and Andana Blocks in Sangrur district have been identified as suicide prone area and yet this part of Punjab was less affected by militancy. Likewise Haryana did not suffer the turmoil and disruption of militancy, yet debt related suicides are being reported from that state too".

The increased number of farmer suicides in Punjab can be understood in the context of growing distress in agriculture of the state. The factors contributing to this state of affairs in agriculture are the decline in the farmers income from the farm, increased cost of production, crop failures and crop loss, monoculture of wheat - paddy cultivation, rising unemployment in the rural areas etc. According to an estimate of the Department of Economic and Sociology, Punjab Agriculture University, Ludiana, "the annual surplus of small

size farm is about Rs. 9500/= during 1993-84". It further estimates that "the best managed five hectares farm with standard field crop rotation, can earn barely an income equivalent to the average per capita income in Punjab." However, in 1999-2000 this could have declined further due to the increased cost of production of principal crops in the state.

Green Revolution is No More Green

The large-scale suicide of farmers in Punjab exposes the flaws in the much-vaunted green revolution. Today the village agricultural economy of Punjab is in crisis and the living conditions of the farming community and farm labourers are in bad shape.

Mr. Prakash Singh Badal, the present Chief Minister of Punjab, has said once "agriculture for most has become a pain in the neck. It is not profitable at all except for those who own ten acres or more... What is in the hands of the state? Everything has been centralised. Prices of all inputs are controlled and fixed either by the industry or Union Government. The price of farmers produce – wheat and paddy and most of the other produce – are fixed by the Centre (Tribune, May 15, 1998).

The farmers of Punjab are voracious users of inputs in their bid to enhance productivity of agricultural crops. For example, Punjab consumes 10 percent of the fertilisers, 11 per cent of the pesticides and 55 percent of the herbicides used in the entire country. The same is true for other agricultural inputs like irrigation and use of farm machinery.

In Punjab the growth of agriculture is mainly confined to two crops, rice and wheat, and has reached its saturation point. The data of Punjab indicates

TABLE 4.20

Distribution of number of Operational Holdings and Area of various categories by size groups during 1990-91 agricultural census

Sl. No.	*Category of Holding*	*No. of Operational Holdings*	*%age of Holdings*	*Area Operated Total Area (in Ha.)*	*% age of Total Area*	*Av. Size of Operational Holdings (in Ha.)*
1.	Marginal (Less than 1.0 Ha.)	295668	26.47	164224	4.07	0.56
2.	Small (1.0 to 2.0 Ha.)	203842	18.25	328215	8.14	1.61
a)	**Sub Total (1+2) (Less than 2.0 Ha.)**	**499510**	**44.72**	**492439**	**12.21**	**0.99**
3.	Semi Medium (2.0 to 4.0 Ha)	288788	25.86	841541	20.87	2.91
b)	**Sub total (a+3)** (Less than 4.0 Ha)	**788298**	**70.58**	**1333980**	**33.00**	**1.69**
4.	Medium (4.0 to 10.0 Ha.)	261481	23.41	1621811	40.22	6.20
5.	Large (10.0 Ha and above)	67171	6.01	1076892	26.70	16.03
	Grand Total	**1116951**	**100.00**	**4032683**	**100.00**	**3.61**

Source: *Agricultural Statistics of Punjab on the Eve of New Millennium: 2000; Statistician - Department of Agriculture, Punjab*

Crop Failures lead Punjab Farmers to Suicide

Chandigarh, April 20.

About 80 cases of suicides by farmers and agricultural labourers reported from five villages of Sangrur district in the last four or five years could only be the "tip of the iceberg" as death stalks the rural areas of the Lehra and Andana blocks in the otherwise prosperous distirct of Punjab.

According to a former sarpanch, Mr. Jarnail Singh, and a jathedar, Mr. Mastan Singh, about 33 persons had been driven to suicide in Balaran village. While it is zero in the official record, since 1994

The Hindu, New Delhi, 21.04.1998

that the productivity of rice was 4.89% during 1965-66 to 1985-86 and it declined to 0.58 % between 1885-86 to 1996-97. The productivity of wheat has also declined from 2.79 to 2.14, sugarcane declined from 3.40 to 0.28 in the corresponding period. The productivity of cotton increased to 1.63 between 1965-66 to 1885-86 but the total production of cotton in the state declined from 19.25 lakhs bales in 1996-97 to 9.41 lakh bales in 1997-98 due to the pest attack and crop failures. However, in the 80's itself, the Punjab Agriculture University, Ludhiana, made it abundantly clear that farmers with holdings less than 14 acres were fighting a losing battle for survival.

Essential factors such as soil health and water resources are getting overstrained and there is a serious build up of pests, diseases and weeds. Pest has emerged as a very serious menace in Punjab due to monocultures. There is also no scope for further expansion of the area under cultivation or increase in the cropping intensity (which is at present at a very high level of 186 percent).

The water resources of the state are being over exploited through the adoption of high water requiring cropping sequences and the use of high yielding varieties.

State of Punjab in Brief

- The state of Punjab covers an area of 50,33,000 hectares constituting about 1.57% of the total geographical area of the country.
- There are 17 districts viz. Amritsar, Bhatinda, Faridkot, Ferozepur, Gurdaspur, Hoshiarpur, Jalandhar, Kapurthala, Ludhiana, Sangrur, Ropar, Mansa, Fatehgarh Sahib, Nawa Shahr, Moga and Muktsar which have further been divided into 138 blocks comprising 12795 villages.
- The population of the state as per 1991 census is 20.28 million. Out of this 1,42,88,744 is the rural population while the urban population is 59,93,225.
- The state has been divided into three agro-climatic zones, viz Sub Mountainous Zone, Central Alluvial Zone and Southern Dry Zone. The climate of the state is semi humid to semi arid.
- Of the total geographical area of 50.33 lakh hectares, net sown area in 1997 - 1998 was 42.04 lakh hectares constituting approx. 84% of the total area as against the national average of 42%.
- The gross cropped area is 78.33 lakh hectares and the cropping intensity is 186%. The net irrigated area in Punjab was 40.21 lakh hectares in 1997 - 98 and 96% of the gross cropped area is under irrigation. In 1997 - 98 the average fertiliser consumption works out to be 167 kg / hectare in Punjab against all Indian average of 73 kg/ hectare.
- The numbers of small and marginal farmers having upto 5 acres of land are about 499,510 and having 45% of the total land holding in Punjab. The average land holding of small and marginal farmers are only .99 hectares. (Table 4.20)

Increased Cost of Production

The increase in the prices of inputs and labour has pushed the cost of production up during the last three decades, (6 times for wheat, 7 times for cotton and 10 times for paddy). The increased cost of production has led to increased indebtedness among farmers in Punjab. Today 90 percent farmers of Punjab are in the trap of debt.

To get an idea of the soaring cost of cultivation in Punjab it is desirable to study the trends of the three major crops of the state i.e. Paddy, Wheat and Cotton.

The per hectares cost of cultivation of paddy in Punjab has increased to five times in a span of 18 years from Rs. 3419.33 in 1978–79 to Rs. 17,966.85 in 1996-97. The cost of production of per quintal of paddy has increased from Rs. 68.71 in 1978-79 to Rs. 334.81 in 1996-97 (see Table 4.21).

However in comparison to the five-fold increase in the cost of cultivation of paddy there is no corresponding increase in its yield. The yield increased by just 2.17 quintals per hectare from 1978–79 to 1996-97. However, during this period there is very significant increase in the use of fertiliser, insecticide and machine labour in the paddy crop in Punjab and a very drastic decline in the use of animal labour. This also indicates that the Punjab farmers have almost left doing any manual work at their farm. They have left it to either migrant labourers to do all manual jobs or use machinery.

The fertiliser use in Paddy increased from 163.85 kg in 1978–79 to 195.49 kg per hectare in 1996-97. During the same period the total amount of insecticide, in terms of value, also increased from Rs. 56.77 to Rs. 825.04 while the machine labour cost increased from Rs. 90.93 to Rs. 956.80. Unfortunately the heavy use of machine labour has its impact on the animal labour in the farm which declined from 21.89 pair hours in 1978-79 to 1.99 pair hours in 1996-97 (Cost of Cultivation of Principal Crops, '91, '96 & Feb. 2000).

The wheat crop has also shown the similar increasing trend in cost of production. There is a six fold increase in the per hectare cost of cultivation of wheat in Punjab from Rs. 2722.36 in 1977-78 to Rs. 17,333.89 in 1997-98. During the same period the cost of production per quintal of wheat has also increased from Rs. 108.57 to Rs. 411.97 (see Table 4.22).

In wheat, the yield has increased from 22.61 quintal in 1977-78 to 35.78 quintals per hectare in 1997-98. In comparison to this, during the same period, the fertiliser use also increased from 125.69 kg per hectare to 224.87 kg per hectare, the cost of insecticide per hectare increased from Rs. 0.95 to Rs. 428.83 and cost of machine labour per hectare also increased from Rs. 283.03 to Rs. 1692.07. Due to the heavy use of machine labour, the animal labour declined from 45.44 pair hours in 1977-78 to 2.47 pair hours in 1997-98 (Cost of Cultivation of Principal Crops, '91, '96 & Feb. 2000).

Cotton is not untouched either. There is sharp increase in the cost of cultivation of cotton. In 1975-76 the cost of cultivation was Rs. 2154 per hectare which increased to Rs. 19,497 per hectare in 1996-97 which is more than eight-fold increase. Obviously the cost of production per quintal has also increased in this period from Rs. 225.95 to Rs. 1703.04 (see Table 4.23).

In cotton also there is no significant increase in yield in Punjab despite heavy use of fertilsers and pesticides. In 1975-76 the yield of cotton was 9.11 quintals

TABLE 4.21
Economics of Paddy Cultivation in Punjab

ITEMs	*1974-75*	*1978-79*	*1981-82*	*1982-83*	*1983-84*	*1984-85*	*1985-86*	*1986-87*	*1987-88*
1. Cost of Cultivation per Heact. (Rs.)	2894.33	3419.33	5473.89	5805.82	6482.42	7016.31	6639.97	7390.21	7847.81
2. Cost of Production per Qtl. (Rs.)	91.63	68.71	102.31	103.87	122.32	137	125.74	129.23	149.19
3. Yield Per Hect. (Qtls.)	31.15	49.47	53.3	55.66	52.82	51.14	52.33	56.71	52.1
4. Fertilisers Use per Hect. (kg. Nutrients)	84.1	163.85	171.72	157.57	213.14	192.57	161.3	165.87	194.51
5. Fertilisers rate per Unit (kg. Nutrients)	-	-	5.01	5.22	4.95	5.02	4.99	5.34	4.99
6. Fertilisers Cost per Hect. (Rs.)	387.67	569.18	860.39	822.02	1055.4	965.86	805.66	885.19	970.95
7. Animal Labour input per Hect.(pair hours)	97.58	21.89	36.54	29.69	26.69	38.26	30.57	25.45	18.96
8. Seed cost per Hect. (Rs.)	110.34	113.39	134.78	124.27	129.73	140.72	130.12	126.54	152.38
9. Insecticide cost per Hect. (Rs.)	0.31	56.77	119.36	109.39	142.54	168.64	146.15	170.42	169.64
10. Mechine Labour (Rs.)	44.44	278.75	310.21	426.66	447.99	463.81	460.89	445.44	685.14

	1988-89	*1989-90*	*1990-91*	*1991-92*	*1992-93*	*1993-94*	*1994-95*	*1995-96*	*1996-97*
1.	7684.71	8785.65	10082.42	10390.8	12651.21	14593.63	15248.49	15526.2	17966.85
2.	159.55	147.18	194.69	206.77	224.38	266.87	290.36	338.81	334.81
3.	47.3	58.97	51.37	49.79	56.18	53.93	51.84	46.03	51.64
4.	179.44	188.03	213.39	185.34	193.04	183.25	195.21	156.99	195.49
5.	4.82	4.76	5.36	5.64	7.21	7.31	8.1	8.47	8.82
6.	865.79	894.24	1144.07	1045.92	1392.58	1340.07	1581.19	1329.86	1724.63
7.	17.16	25.96	6.94	7.35	4.1	5.88	3.79	4.77	1.99
8.	153.89	155.64	174.45	189.9	183.94	218.57	293.87	281.21	354.81
9.	172.82	220.13	262.05	323.27	380.83	490.84	650.44	609.27	825.04
10.	583.25	772.12	990.8	925.49	1087.17	966.85	1053.54	1259.76	1789.07

Source: *Cost of Cultivation of Principal Crops in India, 1991, 1996 and February 2000; Directorate of Economics and Statistics, Ministry of Agriculture, New Delhi*

TABLE 4.22

Economics of Wheat Cultivation in Punjab

	ITEMs	*1970-71*	*1971-72*	*1972-73*	*1973-74*	*1974-75*	*1975-76*	*1976-77*	*1977-78*	*1978-79*	*1979-80*	*1980-81*	*1981-82*
1.	Cost of Cultivation per Hect. (Rs.)	1654.59	1769.25	1650.54	2037.14	2668.65	2632.32	2611.89	2722.36	3040.93	3161.83	3439.47	3776.19
2.	Cost of Production per Qtl. (Rs.)	61.04	59.71	67.1	74.34	87.76	99.45	101.39	108.57	101.45	102.88	124.7	118.77
3.	Yield Per Hect. (Qtls.)	24.4	26.43	22.6	24.87	27	23.11	22.74	22.61	27.49	27.91	25.2	30.75
4.	Fertilisers Use per Hect. (kg. Nutrients)	-	110.39	109.53	112.54	80.26	98.71	119.08	125.69	155.9	172.88	168.35	153.05
5.	Fertilisers rate per Unit (kg. Nutrients)	-	2.09	2.19	2.66	5.25	4.37	3.7	3.25	3.43	3.32	4.63	5.36
6.	Fertilisers Cost per Hect. (Rs.)	208.6	230.61	224.76	299.06	421.33	430.96	440.96	407.94	534.67	574.44	781.11	820.03
7.	Animal Labour per Hect.(pair hours)	-	103.92	103.08	96.63	101.66	93.87	92.6	72.25	45.44	45.19	37.94	31.49
8.	Seed cost per Hect. (Rs.)	65.35	68.68	74.96	84.04	107.2	108.53	120.97	144.21	145.16	133.66	163.56	168.16
9.	Insecticide cost per Hect. (Rs.)	0.41	0.47	3.37	7.12	1.16	2.22	0.01	0.95	5.73	9.97	14.16	22.51
10.	Machine Labour (Rs.)	80.43	107.59	101.36	141.44	113.84	174.55	152.1	283.03	337.02	367.58	458.46	474.24

	1982-83	*1983-84*	*1984-85*	*1985-86*	*1986-87*	*1987-88*	*1988-89*	*1989-90*	*1990-91*	*1991-92*	*1992-93*	*1994-95*	*1995-96*	*1996-97*	*1997-98*
1.	4227.28	4452.57	5154.72	5387.84	5306.96	5943.42	6686.22	6991.52	8002.43	9274.96	10945.52	13598.04	14311.17	17992.01	17333.89
2.	125.19	137.47	136.33	129.29	151.49	139.95	150.01	164.24	190.79	210.41	250.72	298.68	342.83	362.5	411.97
3.	30.75	29.49	33.45	35.6	30.32	34.14	36.51	36.93	36.22	38.34	37.08	39.41	36.06	43.48	35.78
4.	155.59	161.24	162.36	167.82	182.4	183.2	184.63	189.5	208.04	197.98	194.63	203.18	203.66	220.17	224.87
5.	5.25	4.82	5.01	4.81	4.93	5.16	5.01	5.21	5.16	6.79	7.99	9.41	10.43	10.48	10.3
6.	816.22	776.4	813.05	808	898.45	944.44	925.63	987.45	1072.91	1344.64	1554.9	1912.61	2124.67	2307.45	2315.34
7.	30.04	27.89	30.83	24.78	19.31	15.58	14.62	13.88	9.37	8.35	5.77	3.72	2.53	2.66	2.47
8.	207.04	195.88	203.72	207.43	227.12	259.79	306.76	276.48	325.38	374.4	403.17	463.95	500.57	647.31	691.19
9.	59.8	111.01	69.17	62.7	104.7	116.45	160.7	190.37	183.2	191.83	208.16	294.26	314.32	388.4	428.83
10.	532.1	535.72	600.89	667.22	657.58	765.49	825.12	826.49	974.35	1093.65	1157.69	1182.02	1384.67	1586.4	1692.07

Source: *Cost of Cultivation of Principal Crops in India, 1991, 1996 and February 2000; Directorate of Economics and Statistics, Ministry of Agriculture, New Delhi*

TABLE 4.23
Economics of Cotton Cultivation in Punjab

	ITEMs	*1972-73*	*1973-74*	*1974-75*	*1975-76*	*1979-80*	*1980-81*	*1981-82*	*1982-83*	*1983-84*	*1984-85*	*1985-86*
1	Cost of Cultivation per Heact. (Rs.)	1535.95	1864.73	2277.47	2154.31	2551.71	3095.85	3417.03	3281.21	3443.7	4527.43	4693.62
2	Cost of Production per Qtl. (Rs.)	149.19	187.37	236.97	225.95	306.1	338.65	331.38	398.08	593.47	357.28	341.66
3	Yield Per Hect. (Qtls.)	9.77	9.52	9.21	9.11	7.97	8.72	10.39	7.77	5.44	12.11	12.95
4	Fertilisers Use per Hect. (kg. Nutrients)	38.77	60.44	41.63	47.36	37.18	43.91	47.58	45.27	54.89	51.89	62.73
5	Fertilisers Cost per Hect. (Rs.)	84.71	134.25	188.03	189.83	126.3	195.26	238.58	230.12	260.24	237.92	302.98
6	Insecticide cost per Hect. (Rs.)	40.2	42.14	30.42	51.99	70.17	117.65	144.44	189.27	255.33	314.67	319.04
		1986-87	*1987-88*	*1988-89*	*1989-90*	*1990-91*	*1991-92*	*1992-93*	*1993-94*	*1994-95*	*1995-96*	*1996-97*
1.		5318.82	6594.17	6514.42	8201.68	8758.21	12447.5	11826.35	13862.64	17311.03	17073.11	19496.52
2.		360.38	385.41	548.35	513.34	849.52	803.62	831.56	1107.38	1421.08	1643.83	1703.04
3.		13.94	16.34	11.25	15.4	9.83	15.1	13.72	12.21	11.92	10	10.93
4.		57.67	68.84	92.47	100.72	123.87	99.73	98.26	101.19	106.15	82.68	86.66
5.		290.18	320.66	430.88	477.02	686.54	527.67	670.38	696.25	882.2	710.94	776.11
6.		351.88	466.05	582.56	651.51	1131.22	1095.72	1446.85	1597.24	2243.19	1999.69	2401.49

Source: *Cost of Cultivation of Principal Crops in India, 1991, 1996 and February 2000; Directorate of Economics and Statistics, Ministry of Agriculture, New Delhi*

TABLE 4.24
Consumption of Chemical Fertilisers (000 Nutrient Tonnes) in Punjab

Fertilisers	*1970-71*	*1980-81*	*1990-91*	*1995-96*	*1996-97*	*1997-98*	*1998-99*
1. Nitrogenous	175	526	877	1020	962	1005	1081
2. Phosphatic	31	207	328	227	229	287	275
3 Potassic	7	29	15	16	17	22	19
4. Total (NPK)	213	762	1220	1263	1208	1314	1375
5. Consumption per hect. (in kgs.)	38	143	163	163	155	167	-

Source: *Agricultural Statistics of Punjab on the Eve of New Millennium: 2000; Statistician - Department of Agriculture, Punjab*

per hectare which increased to only 10.93 quintals in 1996-97. In comparison to the yield the cost of insecticide use increased from Rs. 51.99 to Rs. 2401.49 and the fertilisers cost increased from 189.83 to Rs. 776.11 per hectare during the same period (Cost of Cultivation of Principal Crops, '91, '96 & Feb. 2000). In 1999-2000 the total consumption of pesticides in Bhatinda alone was about 941,671 liters. Out of this 90% are used only in cotton.

Cotton is a major crop of the southwestern districts of Punjab such as Bhatinda, Faridkot, Mansa, Moga, Muktsar and Sangrur which accounted to 13 to 20 percent of the national cotton production. But in the last few years there is a sharp decline in cotton production. The major constraints in cotton crop are the inadequate availability of certified cotton seed, water logging in some pockets of the cotton area, bad weather condition during cotton season etc.

In Punjab about 80-85% of the area under this crop is covered by American cotton (*Hirsutum*) and the remaining area is under desi (*Arboraum*) (see Table 3.10). Among the prominent varieties of American cotton are LHH-144, Fateh, F-1378, LH-1556, F-1054, F-846, and LH-900 and the desi cotton varieties are LDH-II, LD-491, LD-327 and LD – 230.

In the last few years there is a drastic increase in population of sucking pests and aphids, jasids and bollworm particularly American Bollworm. The farmers are following the dangerous trend of spraying cocktail of pesticides so that atleast one or the other chemical of the mixture could control the pest.

TABLE 4.25
Variety wise area under Cotton in Punjab

American Cotton Varieties				*(Area in '000 Hectares)*
	Variety	*1998 - 99*	*1999 - 00*	*2000 – 01*
1.	F 846	237.30	151.84	57.90
2.	F 1378	53.10	75.50	131.92
3.	LH 1556	37.50	26.50	79.80
4.	Hybrids	10.20	31.13	76.82
5.	Skinderpuri	32.30	20.40	29.80
6.	F 414	34.00	20.00	14.85 (Pk 54)
7.	Others	47.90	43.93	48.82
	Total	**452.30**	**369.30**	**439.91**
Desi Cotton Varieties				
1.	LD 327	54.20	60.40	82.19
2.	RG 8	46.50	33.10	24.68
3.	Others	9.00	12.20	3.22
	State Total	**562.00**	**475.00**	**550.00**

Source: *Department of Agriculture, Punjab*

Fifteen years back Paramjit Singh of Punjab cultivated chillies. Over the years, the cost of chemicals increased. Lately, the yield had also declined considerably. Local money lenders forced Paramjit Singh to sign on blank papers in return for giving him loans and took over his land. When he could not repay his loans, they dragged him off the land. This was more than he could bear, and he committed suicide.

One significant change occurring in the last couple of years in the cotton cultivation in Punjab is the increase in the area of hybrid cotton. It has increased from 10,200 hectares in 1998-99 to 76,800 hectares in the present cropping year i.e. 2000-2001. This is disturbing trend and it will further escalate the cost of cultivation of farmers and would promote a very intensive use of pesticides as we have witnessed in Andhra Pradesh.

However, hybrid seeds by their very nature are high-risk seeds under high input conditions affordable only by rich farmers. They may give good yield but for resource poor farmers, they translate into high risks and high debts.

Also, hybrid seeds are highly pest prone and therefore need frequent pesticide applications. Pesticides create new pest problem as well as environmental and health hazards. Pesticides failed to control pest whether or not they are spurious.

With the increase in the area of hybrid cotton the pest attack will further increase and it will create more problem for the Punjab farmers.

Due to the pesticide treadmill the farmers borrows money on credit to buy pesticides. In 1999 – 2000 also as the bollworm attacked cotton plants, the farmers started taking more loans to buy pesticides and insecticides to save their crops. While the Agriculture Department authorities maintain that there was a mild attack of bollworm in the cotton belt, cotton growers of about 20 villages in Talwandi Sabo Block of Bhatinda pointed out that the attack was alarming. Sikander Singh of Bhai Bakhtaur village says, "*Sundi* (bollworm) has badly hit the crop. If the bollworm were not killed at this stage, it would kill the cotton growers." He was not able to return the loan last year for buying pesticides and insecticides for spraying on the cotton crop but this year he had to take a loan again for the same task (Tribune, 17.8.2000).

Another farmer, Mr. Resham Singh said that for the past six years he had been growing cotton and suffering losses. Every year he had been taking loans to meet his agricultural and social needs and now he was neck deep in debt.

The cotton farmers points out that bollworm has become resistance to insecticide and pesticides. If the government fail to take

TABLE 4.26

Details of the use of Chemical Pesticide in Cotton cultivation in Bhatinda, Punjab

1st Spray of Systemic Products *(one among the six given below)*			*After 60 days of planting*
	Systemic Products	*Dosage/ Acre*	*Price/ Acre*
I.	Confidor	40 ml.	Rs. 125/-
II.	Monocrotophos	400 ml.	Rs. 100/-
III.	Metasistocs	400 ml.	Rs. 125/-
IV.	Roger	400 ml.	Rs. 80/-
V.	Dymecon	150 ml.	Rs. 60/-
VI.	Endosalpha	1 liter	Rs. 200/-
Dosage of the first spray recommended by Department of Agriculture, Bhatinda			
2nd Spray also of the Systemic products *(in the same dosages)*			*After 70-75 days*
3rd Spray of Synthetic Parathoid *(one among the five given below)*			*After 80-90 days*
	Synthetic Parathoid	*Dosage/ Acre*	*Price/ Acre*
I.	Fhenwalrate	150 ml.	Rs. 40/-
II.	Cypermathlin	200 ml.	Rs. 50/-
III.	Alphamathrin	150 ml.	Rs. 70/-
IV.	Karate	150 ml.	Rs. 70/-
V.	Decameterin	200 ml.	Rs. 100/-
4th Spray is often a cocktail of one of the Synthetic Parathoid mixed with one of three given below			
	Chemical Name	*Dosage/ Acre*	*Price/ Acre*
I.	Cloropariphos	1 liter	Rs. 150/-
II.	Etheon	800 ml.	Rs. 150/-
III.	Quienalphos	800 ml.	Rs. 160/-

On an average 9-10 sprays are made in Cotton in Bhatinda and for that matter in the entire cotton belt in Punjab. Sometimes it goes up to 15. After 4th spray the farmers simply make a cocktail of chemicals from 1st, 3rd and 4th spray chemical lists, choosing the chemicals randomly. Sometimes a cocktail of two chemicals are used but very often, as witnessed during heavy pest infestation in last few years, 3 - 4 chemicals are mixed for spray in cotton fields.

any action and the farmers fail to adopt the alternative methods of pest control and integrated management of pests, Punjab might again witness a spurt in the numbers of farmers suicides.

For economic survival of small and marginal peasants it is imperative to shift away from pesticides treadmill which is pushing farmers into debt and suicides. The farmers are being forced into intensive industrial agriculture which is leading to the loss of their money, their land and their lives.

Extensive Crop failure

Besides the pest attack another menace being faced by the farmers in Punjab is the extensive crop failure and seed failure. Many analysts have attributed crop failure and seed failure as the reason of suicides in Punjab. Prof. Gopal Iyer has acknowledged this fact in his report on Suicides in Punjab. He says that "Punjab has also experienced substantial crop loss in cotton consistently during 90's and there was a major crop loss during 1998 Kharif. This fact has been adequately acknowledged by the Punjab Government in its report submitted to the Central Government for compensation to Punjab farmers due to crop loss for Kharif in 1998. The untimely rain in the third week of September and again from October 15 to 18, 1998 caused extensive damage to standing and harvested crops in Punjab" (Iyer and Manick, 2000).

However, there are also examples of seed failures and farmers have suffered huge loss. In this cotton season (1999-2000) too several instances of crop failure were noticed. In the Jagaram Tirath village of Talwandi Sabo Block, District Bhatinda, the Kohinoor Variety of hybrid cotton is performing very poorly. Most of the farmers who have sown this variety are not happy with this and they

TABLE 4.27
Cropping Pattern of Punjab

in Percentage)

S.N.	*Crops*	*1950-51*	*1960-61*	*1970-71*	*1980-81*	*1990-91*	*1995-96*	*1996-97*	*1997-98*
1.	Paddy	2.9	4.8	6.9	17.5	26.9	28.2	27.7	29.1
2.	Maize	6.3	6.9	9.8	5.6	2.5	2.2	2.1	2.1
3.	Bajra	5.2	2.6	3.7	1.0	0.2	0.1	0.1	0.1
4.	Wheat	27.3	29.6	40.5	41.6	43.6	41.6	41.43	42.1
5.	Barley	2.4	1.4	1.0	0.9	0.5	0.5	0.4	0.5
6.	Total Pulses	23.8	19.1	7.3	5.0	1.9	1.3	1.3	1.1
7.	Total Oilseeds	3.3	3.9	5.2	3.7	1.5	3.0	3.2	2.5
8.	Sugarcane	2.2	2.8	2.3	1.0	1.3	1.8	2.2	1.6
9.	Cotton	5.4	9.4	7.0	9.6	9.3	9.6	9.5	9.2
10.	Total Vegetables	1.2	1.2	0.9	1.1	0.7	1.0	1.0	1.1
11.	Total fruits	0.8	0.6	0.6	0.4	0.8	1.1	1.1	1.1
12.	Other Crops	19.2	17.7	14.8	12.6	10.8	9.6	10.0	9.5
13.	Total Cropped Area	100.00	100.00	100.00	100.00	100.00	100.0	100.0	100.0

Source: *Agricultural Statistics of Punjab on the Eve of New Millennium: 2000; Statistician - Department of Agriculture, Punjab*

are now mentally prepared to face a total failure of this crop. Some realised this in the beginning and replanted the same field. Mr. Gurcharan Singh (S/o Mehr Singh) and Mr. Gurdeep Singh Sarpanch had to plant again when their Kohinoor Seeds did not germinate well.

Similarly Mr. Mahinder Singh, S/o Mangal Singh of Jagram Tirth village also sown Kohinoor hybrid cotton in seven acres. Though it is an early variety as claimed by the company but till mid of August, after 120 days of planting, very few plants had given flower. The farmers said that by this time the bolls would have been ready. When the villagers went to the dealer to complain he said that the bolls would come and that the same variety is doing well in Rajasthan, knowing fully well that no farmers would go there to investigate.

According to farmers, in more than 20 villages of Moud Mandi, Talwandi Sabo, Rama Mandi, Mansa Mandi about 50% farmers had planted Kohinoor cotton but in all these villages it showed signs of failure, as reported by farmers of Jagram Tirth village.

The loss of crop is a curse for the indebted farmers and in extreme cases they commit suicides.

Cropping Pattern: Trends towards Monoculturism

In Punjab, the cropping pattern shows a trend towards monoculture. The farmers are abandoning the cultivation of diverse crops e.g. pulses, bajra, jowar, oilseeds etc and got trapped into the paddy-wheat combination. This is one of the major reasons of farmers declining productivity and income. They are now dependent upon the market for their day to day requirement of pulses, oilseeds and vegetables. Though Punjab is know for being the "Food Basket of country and Granary of India" it is not in a way bringing prosperity to its own farmers. The Paddy-wheat combination in Punjab is wiping out agricultural diversity.

The area under rice has increased from 227 thousand hectares in 1960-61 to 2,519 thousand hectares in 1998-1999, an eleven-fold increase. The area under wheat increased from 1400 thousand hectares in 1960-61 to 3338 thousand hectares in 1998-1999, while the area under cotton increased from 446 thousand hectares in 1960-61 to 724 thousand hectares in 1997-98 but declined to 475 thousand hectares in 1999-2000 due to crops failures in the last few years. But again in 1999 – 2000 the area under cotton again increased to 550 thousand hectares in Punjab (Agricultural Statistics of Punjab on the Eve of New Millennium: 2000).

However, the area under pulses in Punjab has decreased drastically from 903 thousand hectares in 1960-61 to 78 thousand hectares in 1998-99, more than ten-fold decrease. In the same period gram went down from 838 thousand hectares in 1960-61 to 132 thousand hectares in 1998-99, which is more than a sixty-fold decline. The area under maize went down from 327 thousand hectares to 154 thousand hectares in the same period. Area under oilseeds has also decreased from 185 thousand hectares to 158 thousand hectares. Area under millets and coarse grains has also declined. In the case of Bajra and Jowar, the decline is very sharp, from 123 thousand hectares to only 4000 hectares and 17 thousand hectares to Nil, during the period from 1960-61 to 1998-99 respectively.

It is true that with only 1.57% of the geographical area of the country Punjab produced 19.3% of wheat, 9.6% of Rice and 8.4% of cotton of the total produce during the year 1997-98, and contributes 40-50% of rice and 50-70% of wheat to the Central Pool. However, the increase in area of wheat and rice has shifted the whole cropping pattern of Punjab from diversity to monoculture and quite obviously the shift to monoculture would register an increase of monoculture output but a drastic decline in the output of the diverse crops.

The production of pulses has decreased from 709,000 tonnes in 1960-61 to 50,000 tonnes in 1998-99. Similarly the production of oilseeds, millets and maize has also decreased in Punjab due to the spread of monoculture of wheat and rice. This shift has left no option with farmers except a hope that they would get better yield next year. With that hope they are getting trapped into the treadmill of fertilisers and pesticides and keep on going down into the swamp of debt and humiliation.

Their profit from agriculture has declined while their household expenditure has been increasing. They are still basking in the glory of their good days during the 80' and early 90's when their income had increased many fold due to introduction of HYV, good return from cotton and government supported subsidised inputs to encourage Green Revolution. Today Green Revolution is no longer green. Neither are the HYV performing a miracle of instant increase in yield, cotton has been failing in the last few years and government has been withdrawing the crutches of subsidy. Now to feed their farms with chemical fertilisers and pesticides and to feed themselves and their families they are getting trapped into control of the private money lenders, tractor agencies, seed, fertilisers and pesticides dealers and their burden of debt is increasing every year.

Reckless Mechanisation of Agriculture

Though the agriculture in Punjab is undergoing a severe crisis yet there is no sign of decline in the sale of farm machinery. The farmers of the state have been suffering due to the high cost input intensive agriculture. Table 4.28 on the increase in agricultural implements in Punjab from 1995 to 1999 validates this. In Mansa district alone, which is a very backward district of Punjab and a suicide prone area too, the total number of tractors of all brands sold every year is around 1200 according to Mr. Kishor Chand, Manager Amar Tractor Agency.

However the agricultural experts of Punjab blame tractors for the indebtedness of farmers. The

TABLE 4.28

Agricultural Implements and Machinery in Punjab (in '000 Number)

Position On

S. N.	*Agricultural Implements & Machinery*	*31.3.95*	*31.3.96*	*31.3.97*	*31.3.98*	*31.3.99*
1.	Tractors/ Trailers	320	330	350	365	375
2.	Tiller/ Cultivators	220	228	235	245	250
3.	Disc Harrows (T. Drawn)	240	248	255	265	265
4.	Seed-cum-fertiliser Drill	130	135	140	145	155
5.	Spray Pumps	485	510	525	540	545
6.	Tractor Drawn Combines	4.4	4.6	4.7	4.8	4.9
7.	Self Propelled Combines	2.2	2.3	2.4	2.5	2.7
8.	Threshers	305	305	315	325	340
9.	Cane Crushers	35	35	35	35	30
10.	Tube Wells	860	875	900	925	935

Source: *Agricultural Statistics of Punjab on the Eve of New Millennium: 2000; Statistician -Department of Agriculture, Punjab*

tractor has become status symbol for many a farmers. At present there are about 4 lakh tractors in Punjab. Even farmers with 5-6 acres of land buy tractors in this state. This has given rise to a second hand market of tractors and once a week, tractor mela (market) is held in more than 15 different places in Punjab. But more than that it shows the bad state of affairs of Punjab farmers who are selling their tractors to pay their debt or due to some social obligations.

Farmers buy new tractors on loan and within a month sell it in the market at Rs. 50,000-60,000 less than the actual price. This phenomenon is very much prevalent among distressed farmers in Punjab. The reason for such resale, as acknowledged by some of the farmers, is to repay the loans burrowed from local *arthies*.

Increased Farmers' Suicides

Suicides in Punjab have acquired an alarming proportion in the recent years. The suicides by Punjab farmers are occurring on a large scale especially in the southern districts of Punjab, which is also the main cotton zone of this state.

As reported by Dr. Gopal Iyer and Dr. Meher Singh Manick of the Department of Sociology, Punjab University, the reason for suicides by farmers in Punjab were mainly due to high indebtedness. According to this report, "indebtedness among the farmers and farm labourers in Punjab has reached epidemic proportions. Landless agricultural labourers, small and marginal farmers are more vulnerable than large farmers. Large farmers are able to sell portions of their holdings to pay off debts, which acts as a buffer. The major thrust of the small and semi-medium farmers is to borrow primarily for agriculture and marriage purposes. The lending agencies not only pressurise the farmers to clear the outstanding loans but also humiliate them. They experience loss of prestige and are forced to commit suicide (Iyer and Manick, 2000).

High indebtedness by these farmers is followed by constant pressure from lending agencies to repay the loan which is one of the important factor for farmers to commit suicide. Another important factor is the resistance by the family members towards selling of land to clear off the debts which culminates into suicides by one or more family members.

In the Chek Ali Sher village in Mansa three members of one family committed suicide due to the debt problem. The moneylender claimed his title over the farmers' land, which forced the father and two sons to commit suicides.

Farmers Suicides in Punjab

At an estimate, the Punjab farmers are under debt of a whopping amount of Rs. 10,000 crores. The indiscriminate use of chemical fertilizers and insecticide is eroding the fertility of the land, thereby causing unprecedented loss in natural productivity. A report by Indrajeet Singh Jeji, a former MLA and president of Human Rights Organization, says that almost 500 farmers have so far committed suicide in the state. According to Jeji, Lehra and Andana blocks of Punjab alone accounts for about 174 suicidal deaths till June 2003. Farmers, having less than even one acre, are burdened with the debt from Rs. one lakh to 11 lakhs. Some of them jumped in front of the railway tracks while others

set themselves on fire, but majority of them poisoned themselves. (Sharma 2003)

One of the main reasons is the collapse of nuclear family in Punjab, which has affected the land holdings. There is severe slump in the earnings of the farmers, which is further adding to their debts. Now, the farmers view agriculture as a loss making occupation, and the realization is causing intense pressure among them. They accuse the State Chief Minister Captain Amrinder Singh of backing out of his earlier poll promise of providing bonus of Rs. 30 per quintal on crops in three instalments. The payment of instalments was restricted to certain pockets of the state, and that too at meager rate of Rs. 10, somewhere only Rs. 5.

Punjab is hailed as the launching pad of Green Revolution in India; but pathetically, the farmers of Punjab are facing a debt burden of thousands of crores. Adverse residual effects of irrational application of synthetic fertilizers and plant protection agro-chemicals have decreased the fertility status of the soil. Desperate use of these inputs not only falsified their hopes for better yield but also crippled them financially and the resultant frustration induced them to commit suicide. Increasing cost of production and decreasing productivity are proving most damaging. The situation prevailing in eastern UP, Bihar and Orissa is no better.

It puts a big question mark on the entire concept of planning for agro-rural development in the country. Agriculture, which sustains the national economy, is still the most neglected sector on the priority list of national development. It is amazing how the Central or the State government can afford to remain insensitive to the increasing cases of suicides committed by farmers. It hurts one's sensibility that even a tragic situation like this is not enough to put our policy makers and planners to shame.

The genesis of the recent economic crisis in Punjab lies in the distorted structure of its economy and disarticulated 'agro-cultural' social change. The net barter terms of trade (at 1970-71 = 100) between foodgrains and manufactured products was 93.64 in 1971-72 and it deteriorated further to 85.48 in 1990-91. Thereby, this unequal market exchange also tends to weaken the socio-economic position of the rural households, dependant only or mainly on agriculture as cultivators and farm wage workers. (Azad 2003)

According to a study in Punjab small and marginal farmers and landless labourers were more prone o suicide. 45.2 per cent of the total suicides are by landless labourers, 24.5 per cent are of small farmers, and 18.8 per cent are by marginal farmers. About 18 per cent report indebtedness as a cause of suicides.

A study by the Agro Economic Research Centre (AERC) of the Punjab Agricultural University (PAU) on the indebtedness of farmers, done for the Ministry of Agriculture, threw up some shocking facts. According to the study, the small and marginal farmers are the largest number; their holdings are small in the state and get merely 27.02 per cent of the total agricultural credit. Here

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Sharma, Nisha 2003, "Wheat Granary Suffers," Sahara Times, 4 October 2003.

Azad, Nirmal S. 2003, "Genesis of Economic Crisis in Punjab", Mainstream, vol. XLI, no. 47, 8 November, 2003.

too, the process is marred with wrong selection of beneficiaries, improper monitoring and less promising purposes for which the loans are being advanced, defeating the national objective of providing low-cost credit to this groups. (Thind 2002)

There are 1706 banking institutions including 942 commercial banks in the rural areas of the state which have raised deposits worth Rs. 12,254 crores and advanced about Rs. 6,000 crores as loans to agriculture sector. The share of certain thrust sectors like dairy and poultry, besides fisheries has decreased in the last three years, and what to talk of diversification. Centre, some time ago, had directed the state to slug-fest measures so that a national policy could be drafted to benefit the marginal farmers whose conditions are deplorable even after half a century of independence. The study recommended to the state government and centre to adopt the Self-Help Group (SHGs) strategy to provide low cost credit to the small and marginal farmers, most of whom largely are dependent on the commission agents and moneylenders for their credit needs.

Despite an increased flow of credit in the state, crop loans still constitute more than two-thirds of the agricultural advances. Incidentally, there has been a decline in the proportion of advances made to crucial sectors like minor irrigation from 2.82 per cent to 1.09 per cent, land development from 0.47 per cent to 0.38 per cent, farm machinery from 16.83 per cent to 11.67 per cent, dairy farming from 5.37 per cent to 4.90 per cent, and poultry from 1.58 per cent to 0.87 per cent.

It is interesting to note that commercial banks take nearly 15 days to process a loan against seven days by cooperative banks. But the informal sectors, i.e., moneylenders and commission agents process loan within half day.

Social Reasons

In fact, this culture of committing suicides to escape from the indebtedness and social stigma of being financially broke started in Punjab a few years ago. Small and marginal farmers are opting for commercial crops e.g. hybrid cotton, on a large scale and making huge investment anticipating good return. To meet the heavy investment demands the farmers go for private loans at a very high interest, e.g. 2% to 3½ % per month. This has given rise to several other social problems among cultivators' families in Punjab.

According to the psychiatrists in Punjab, debt trap has led to an increase in consumption of intoxicants, matrimonial disputes and family disputes. Expenses of the community have been ascending. Most of the farmers are very 'status conscious'.

Most of the Punjab farmers have insufficient income to maintain themselves. Many farmers have lost the land and they migrate to the cities in search of jobs as labourers. They feel ashamed to work as labourers in their own village. In the cities they compete with the migrant labourers. Even the landlords prefer to employ migrant labourers because they are cheaper and well behaved as compared to the local labourers.

Moreover the subsidiary occupations of the farming community like animal husbandry, poultry, bees keeping and fisheries are also running in loss. In most

Thind, Amarjit 2002, "Banks Ignore Small Farmers," The Tribune, 22 June 2002.

cases these units were started on loans which the entrepreneurs now find difficult to repay.

Besides that the land holdings are squeezing because of rising population and disintegration of the joint family and it has led to fragmentation of holdings into smaller and smaller parcels.

The village education has been totally neglected in Punjab. There are schools with as may as 300 children with a single teacher. The Mansa–Sangrur districts, where large scale suicides are taking place in last few years, the literacy rate is the lowest. The situation further got worse due to the floods every year in this region.

The *arthies* take advantage of the illiterate farmers and even after total payment of loan money by farmers they normally do not delete the farmers names from their registers. There is a saying in Punjab that "if a farmer takes loan from a commission agent, it will never be over till his death", said Subah Singh of Jagaram Tirth village, Talwandi Sabo, Bhatinda.

Due to increased rural indebtedness in certain village all lands are encumbered. The farmers want to sell the land but there are no buyers. The land price has come down drastically.

Crop Failure and Mounting debts drive Punjab farmer to Suicide

Bhatinda, Oct. 2.

Reeling under heavy debts and disappointed over the decay of his crop, Mohinder Singh (30), a farmer of Nat Bagher village,about 35 km from here, allegedly ended his life consuming pesticide. He has left behind a 27-year old wife and three children.

Mohinder's uncle told the Indian Express that he (Mohinder) owed Rs. 2 lakh to a commission agent and money lenders. He has taken nine acres of land on contract at the rate of Rs. 7,000 per acre.

His coton crop on seven acres was destroyed by American bollworm and other pests. Another farmer , Jarnail Singh said that about 90% farmers of the village were under debt owing to thebad crops for the past five years.

The Indian Express, New Delhi, 03.10.1998

Credit Facilities to Farmers

Farmers in Punjab are borrowing from various credit sources/ agencies. The main agency that are financing the credit needs of the farmers in the state are cooperative credit institutions like Primary Agricultural Credit Societies and Primary Land Development Banks, Commercial banks, and Regional Rural Banks and also the informal sector credit agencies like commission agents (arthies) and money lenders.

The borrowing for financing the current farm expenses is on a short-term basis normally for a crop season, and these loans are repaid (fully or partly) through the sale proceeds at the end of the season. Fresh loans are again taken to finance the working capital requirement of the next cropping season. In a way a never ending viscous cycle of lagging loan continues between farmers and lending agencies.

The credit advanced to the farmers of Punjab increased six times between 1990-91 to 1998-99 (see Table 4.29).

A formal credit agency lends money to farmers by registering their land as security in its name. Similarly banks also provide loan against security of land. Once the loan is forwarded to the farmer, these agencies ensure that the farmer does not apply from any other bank for loan by putting their stamp on the papers.

Over the years banks and the financial lending agencies have changed their methods of extraction of loans from the farmers. Once the stipulated date of

TABLE 4.29

Advancement of Credit to Farmers {Rs. in Crores (10 million)

S.N.	*ITEM*	*1990-91*	*1995-96*	*1996-97*	*1997-98*	*1998-99*
1.	**Kharif Season**	159.01	440.86	562.57	693.63	804.31
i)	Cash	79.25	262.75	371.92	468.92	548.28
ii)	Kind	79.76	178.11	190.65	224.71	256.03
2.	**Rabi Season**	204.12	505.65	535.60	679.28	898.69
i)	Cash	102.83	232.98	274.46	364.46	564.72
ii)	Kind	101.29	272.67	261.14	314.82	333.97
3.	**Total**	363.13	946.51	1098.17	1372.91	1703.00
i)	Cash	182.08	495.73	646.38	833.38	1113.00
ii)	Kind	181.05	450.78	451.79	539.53	590.00

Source: *Agricultural Statistics of Punjab on the Eve of New Millennium: 2000; Statistician - Department of Agriculture, Punjab*

recovery of loan is crossed the banks auction the land by going through the village and announcing on a loudspeaker. This method of auction, according to farmers, is being done to humiliate them as well as to terrify other farmers so that they make their payment on time. The three acres land of Mr. Roshan Singh of Bhai Bhakhtuar village of Maud Block of Bhatinda was auctioned in the similar way by the bank.

All the farmers irrespective of their own investment through loans go for the meager loan of Rs 2000 provided by the bank. According to a study conducted by Dr. Shergill of the Punjab University, the total debt on the farmers of the Punjab state is about Rs. 5700 crore (Shergill, 1998). This debt is about 70% of the net domestic product originating in the state in a year. In other words, three fourth of one year's total agricultural income of the state has to be paid if the total amount of debt is to be liquidated. However, to freeze the annual recurring interest charged on the total debt, about 13.2% of the total farmland area of the state will have to be mortgaged by the farmers. Seventy percent of the farmers are unable to repay their loans. The Punjab scenario is distressing - farmers are unable to sell their land, tractors and cattle - these go at throwaway prices to meet their debt commitment. The cash expenditure of the farmers has been steadily growing which has resulted in continuous decline in the net surplus generated from production of these crops.

Loans through government agencies in the 80's and early 90's used to be waived off by the government. But now it is different scenario because the loans are being taken mostly from the private moneylenders. As per Mr Rudlu Singh, a farmer member of the BKU Ekta, Mansa, there are about 24,000 commission agents in Punjab who charge compound interest for loan money which gets doubled in a short period of 3 years, 3 months and 19 days.

The arthies copy the formal credit institutions and register the land of the borrowers on their name as a security. When a farmer borrows a big amount from the arthies, he registers his land for the same value. If the borrower fail to repay the loan he looses his land. But sometime the arthi gives the land to the owner to cultivate as tenants and not as owner. Due to social stigma and shame the victim farmers never tell others in the village that he has become landless.

About Rs. 8000 crores of arthi's money is floating in market in Punjab. These arthies pay no income tax on this amount. There are total 12560 villages in the state of Punjab and on an average two arthies operate in each village and control the village finance and economy, according to the BKU Ekta.

The arthies in case of failing to get their money back from farmers, take

away tractors, trolleys, grains and sometimes occupy house and lands of the defaulters. Mr. Mange Ram arthi of Mansa Mandi took away the tractor and Rs. 82,000/- from a farmer Mr. Mahinder Singh, s/o Mr. Arjun Singh, of Burj Tilam village in Mansa district for not repaying a debt of Rs. 3 lakhs to him. To pay the money Mange Ram had to sell his land.

A farmer in village Jattan Khurd in Mansa district had taken a loan of Rs. 65000 and could not repay due to successive crop failure. The commission agent took away 35-40 quintals wheat, the annual ration, lying in his house and his tractor with trolley. With the intervention of BKU Ekta, the farmers only got back his wheat.

Two More Farmers Commit Suicide in Punjab

In yet another case of debt and crop failure deaths, two farmers of Bir Khurd village in this district allegedly committed suicide by consuming pesticides. Bikkar Singh (39) and Baldev Singh (42) ended their lives on October 19 and October 16, respectively. Both of them were deep in debt.

He had borrowed lakhs from the commission agents and money lenders and mortgaged half of his 8 acre land to money lenders.

The Indian Express, New Delhi, 25.10.1998

There are several farmers in Bhai Bhakhtawar village in Maud Tehsil in Bhatinda District, whose land has been seized by arthies. Some of them are Jagseer Singh (s/o Jaggar Singh), Bant Ram Vpeywala, Nichatar Singh and others.

According to Dr. H. S. Shergill, "In 1997 farmers borrowed a whopping Rs. 3119 crore. Sixty one percent came from traditional commission agents. Here interest rates are between 24 to 30 percent. Cooperative could mange just 34 per cent; the rest – a meager 4 percent – came from commercial banks" (Shergill, 1998). This situation is particularly detrimental to the small farmers as interest rates are dictated by size of holding - smaller the holding, the higher the interest.

Such exploitation by the commission agents and burden of debt are forcing several farmers in Punjab to commit suicide. Even in the year 2000 the suicides are taking place on large scale in Punjab and no body in the government seems to have paying any attention. Unfortunately these suicides are rarely reported to the police. The discrepancy in the actual figure (collected by activists and farmer unions) and the official figure is explained by the fact that many suicides go unreported and official figures are invariably less than the real ones.

There seem to be a unanimous agreement among villagers in the rural Punjab about not reporting these deaths to the police as suicides. The villagers justify by stating it would avoid "desecration of the dead body during post-mortem examination and associated harassment by the police".

The most common method adopted by farmers for suicides is drinking pesticides and agricultural fumigants, which are available in abundance. Hanging, drowning, self–immolation and throwing oneself before the running train are also resorted to by some farmers.

About 150 cases of suicides by farmers and agricultural laborers have been reported in last 4-5 years from the Lehra and Andana blocks of Sangrur district. In a single village 'Dhindsa' of the Lehra Block, in last 5 years more than 15 farmers have committed suicide due to crop failure and increased debt.

In 1999-2000 suicides by farmers continued in Punjab due to the acute indebtedness, exploitation of commission agents and crop failures. Mr. Tirth Anok Singh of Jagaranm village was in debt of Rs. 1 lakh which he borrowed from an arthi. He also bought a tractor (Mahindra 256 DI) against his lands and was in debt of Rs.2.5 lakhs to the State Bank of Patiala. But one month after the purchase of tractor the Arthi took away his tractor. Mr. Singh left his

house the day his tractor was seized and never returned back. His son Mr. Pretem Singh said that his father might have committed suicide. The Arthi sold the tractor in more than Rs. 2 lakhs but kept all the money and nothing was given back to Mr. Singh family after deducting the loan money. Neither any paper was given to the victim family after the sale of tractor. The family is continued to be paying the interest to the Bank otherwise they would loose the land, because the farmers lands are registered in the name of loaner Bank.

In April 2000, Mr. Sadhu Singh, aged 40 years of Dhindsa village, Mwonak Tehsil of Sangrur committed suicide. In 1998 he took around Rs. 35,000 loan from commission agent. In last two successive years his crop had failed. He had also taken land on lease against his wife's jewelry. After his death the owner of land kept the jewelry and gave the land to the commission agent.

In August 2000 two landless laborers, Mr. Surju, s/o, Chand and Mr. Sukhdev, s/o Preetam of Dudian village under Mwonak Tehsil of Sangrur district committed suicide for not being able to repay the debt.

In Punjab, the granary of India, farmer suicides are a spectre grown too big to ignore. Earlier, proud jat Sikh farmers even hesitated to admit debt in their family. Now, suicide is not a matter of shame anymore Villagers speculate who's next.

With around 11 lakh farmers, Punjab's high per capita debt of Rs. 41,000-plus translates into a total rural debt at Rs. 5,000 crore! Economists call even this a "gross underestimate". In March 2003, total institutional loans outstanding against farmers was Rs. 10,745 crore. Rs. 9,240 crore is outstanding towards commission agents.

The green revolution brought bountiful crops together with a sharp hike in living standards and credit was no problem. Somewhere down the line, this credit turned into serious debt. About 25 per cent of the agricultural income in Punjab goes towards interest payment. "Though agricultural output has grown sharply, per capita income of the agricultural population grew much slower at 1.5 per cent.

According to Shri Inderjeet Singh Jaijee, President of Movement Against State Repression (MASR) about 1360 suicides have taken place in 91 villages in just two blocks of Andana and Lehra in Sangrur district of Punjab.

MASR's figure of 1360 for just two blocks stands in stark contrast to the figure of 2116 for the entire state (since 1988) given in the State Government's report submitted to the Central Government in November, 2004. If all of Punjab's 138 blocks show roughly the same level of suicides, what will be the total number of suicides for the entire state? Even if some blocks are prosperous. It is likely that the rural suicide toll for the same period must exceed 40,000. (Jaijee 2006)

Following are some of the villages where a large number of suicides have been reported in Andana and Lehra Blocks of Sangrur:

S.No.	*Name of the Village*	*No. of Suicides*
1.	Alisher	19
2.	Andana	27

Jaijee, Inderjeet Singh 2006, "Summary of The Study on Suicides, Circulated in Public Hearing in Leheragaga Sangrur, Punjab, 2nd April 2006.

3.	Arkwas	15
4.	Balran	80
5.	Bokhorakalan	44
6.	Bhoolan	48
7.	Bhutal Kalan	12
8.	Chottian	50
9.	Daska	27
10.	Dhindsa	22
11.	Dudian	22
12.	Gaga	27
13.	Gobindpur Jajjan	21
14.	Gobindpur Jawaharwala	22
15.	Gulahari	25
16.	Hamirgarh	24
17.	Karoda	23
18.	Khandebad	13
19.	Khokhar Kalan	22
20.	Khokhar Khurd	12
21.	Ladaal	20
22.	Lehal Kalan	48
23.	Lehal Khurd	22
24.	Moonak	30
25.	Nagla	25
26.	Phuleda	23
27.	Salemgarh	20
28.	Sangatpura	22
29.	Shergarh	17

No matter how hard the Punjab Government tries to conceal, pain and suffering speaks for itself. As it did in the 'Public' Hearing organized by **Navdanya** in association with Voluntary Health Association of Punjab on 2nd April, 2006 at Leheragaga in the Sangrur district; the suicide capital of Punjab. If human tragedy has a face, one saw it in abundance in the Public Hearing. Paramjeet Kaur of Chak Alisher in Mansa spoke about the suicide of her husband, who set him self afire to escape the fatal cycle of loan repayment. Sucha Singh from Bathinda talked how his son consumed pesticide. "My son Harcharan killed himself when his commission agent confiscated 20 quintals of wheat from the fields to make up for outstanding debt" said Sucha Singh Presenting the case of his nephew, who committed suicide. Jeet Singh of Batal Khurd took strong exception to propaganda that the farmers where indebted due to conspicuous consumption.

Voicing dissent against commission agents who charge 36-60 percent annual rate of interest on loans, Buta Singh from Harkrishanpura of Batinda district demanded strong action against commission agent who forced his brother to repay debt of Rs. 3 lakh. His brother hanged himself.

Also present were 15 widows from Bhulan Village in Sangrur – infamous

Some of the suicide victims in Dhindsa village, Sangrur District

Name	*Age*	*Year*
Mr. Angrej Singh, S/o Sher Singh	-	1995
Mr. Satgum Singh, S/o Mukhtar Singh	8 yrs	1995
Mr. Bhola Singh, S/o Lilu Singh	-	1995
Mr. Dashan Singh, S/o Choto Singh	20 yrs	1996
Mr. Naib Singh, S/o Sukhdev Singh	25 yrs	1997
Mr. Mahadev Singh, S/o Labh Singh	26 yrs	1999
Mr. Govind Singh, S/o Dev Singh	19 yrs	2000
Mr. Sadhu Singh, S/o Gurnam Singh	40 yrs	April '00
Mr. Surjeet Singh, S/o Sher Singh	40 yrs	August '00

Source: *Sarpanch of the Dhindsa village.*

for its widows. Presenting her testimony, Vimla, a mother of two children said, "our men died protecting farms. But now there are no farm, our land have become barren."

The analysis of the case studies of suicide victims by Prof. Gopal Iyer, Former Head Department of Sociology, Chandigarh clearly establishes the fact that the cause of suicide has been the acute indebtedness which the farmers had to take for several reasons like higher cost of cultivation, lack of irrigation facilities due to tail ending canal villages, the saline underground water unfit for cultivation, continuous cotton crop loss due to the attack of American Bollworm and so on. All these factors contributed to the accumulation of loans by the farmers which continued to be remain uncleared. The loans were contracted both from the informal sources and the formal sources. The informal sources were mainly from the commission agents and they have emerged as villain of the piece. They have even forcibly taken away farmers tractors. Now it is a common story in every village that farmers are selling their lands to clear the loans. They are undergoing through the process of pauperization. The marginal and small farmers are the major victims. After the suicide the young widow has to take care of the economic needs of the family and also take care of their children. It is indeed a very pathetic and precarious situation which demand an immediate intervention from the Government of Punjab.

CASE STUDIES

Village Harkrishanpura – This is one of the most backward village of Bathinda district. The village has been in the news for the sale due to acute indebtedness, failure of cotton crop, and shortage of canal water. Of the total 1200 acres of land, 600 acres have been sold to outsiders, mainly to the people from Ludhiana. Initially the land has been sold at very low rate of Rs 10,000 per acre. Some of the lands have been purchased by the commission agent. One important reason for the distressed sale of land and for committing suicide is that the village falls at the tail end of canal irrigation and the underground is saline which is unfit for irrigation.

BATINDA

Case 1: Baldev Singh, Age 44 years, Village Chatewala Block Mour, Date of Suicide 6-6-2005,

Baldev Singh committed suicide due to loss of crop, and pressure for returning loan from the Bank and commission agent. He had taken a loan of Rs. 20,000 five years back. He could not return the loan and the amount has now nearly doubled. He received notice from the Bank and Bank official also made personal visit to the family for collecting loan. Similarly another loan of Rs. 7,000 taken from the commission agent for the purchase of pesticides and fertilizers seven years back now increased to Rs. 40,000. The commission agent also pressurized the family to return the loan. Due to the pressure from two lending agencies, he felt humiliated and committed suicide by throwing himself in front of the running train.

Case 2: Jagjeet Singh S/o Kirpal Singh, Village Chatewala, Block Mour, Age 16 years, Date of Suicide 21/09/2003

Jagjeet Singh committed suicide because of the loan burden. One of his loan was taken from moneylender which was in view of the lease amount of 2 acres land amounting to Rs. 50,000 which has been pending unpaid for last ten years. Moneylender took away his crop of two seasons. One was the wheat crop of 20 quintals and cotton crop of 4 quintals. Besides this he had also to face the case filed by moneylender claiming Rs. 1.50 lakh in lieu of the principal and interest. The Bank loan was Rs. 3.83 lakh, which he had taken 8 years back. Besides this the cooperative loan was Rs. 45,000/- and the loan of the commission agent was Rs. 80,000/-. The total outstanding loan with the family is now Rs. 6.58 lakhs. Due to the loan pressure, mainly from moneylenders Jagjeet Singh committed suicide.

Now the family consist of his old father and mother as also his wife and two minor children. The family's economic condition is now pretty bad. They have no adult male member to work in the family.

Case 3: Kulwant Singh, S/o Nand Singh, Village Chatewala, Block Mour, Age 29 years, Date of Suicide 09/02/05

Kulwant Singh committed suicide because of heavy debt burden which he had taken in 2003 from the Bank amounting Rs. 1.20 lakh for agriculture purpose. He could not return the loan and so he received the notices from the Bank. The other loans were from the commission agent amounting to Rs. 40,000/- which he had taken 1998, and now it has increased to Rs. 1.38 lakh. Besides this he has also taken Rs. 74,000/- from the cooperative society and Rs. 50,000/- from the relatives. The total debt outstanding is Rs. 3.72 lakh. The main reason of his committing suicide was the notice he received from the Bank and loss of crop due to the impact of American Bollworm and sale of 3 acres of land to repay the part of the loan of the commission agent.

Case 4: Jagrup Singh, S/o Ajit Singh, Village Chhatewala, Block Mour, Date of Suicide - 05/05/02.

Jagrup Singh committed suicide because of the excess burden of loan. He had borrowed Rs. 40,000/- five years back from Land Mortgage Bank for installing the tubewell. The loan amount is now accumulated to Rs. 80,000/- for which he received a notice from the Land Mortgage Bank. Another loan of Rs. 57,000 he had taken from the Cooperative Society which increased to Rs. 80,400. He had taken a loan of Rs. 80,000 six year back from the commission agent. The commission agent caught hold of the entire wheat production which Jagrup Singh had brought for selling to him on 24th April 2002. The commission agent did not return any amount to him as a result of which he committed suicide few days later on the 5th May 2002.

Case 5: Gurjant Singh, Village Miserkhana, Block Mour, Date of Suicide 02/07/03.

Gurjant Singh was heavily under pressure from the pesticide dealer, the commission agent and the Bank to return the outstanding loan. He had taken

pesticide from the dealer for Rs. 57,000/- during 1996-97. The pesticide dealer used to come frequently to recover the loan. He used to create problem to Gurjant Singh both in the morning and evening. The pesticide dealer also filed a case against Gurjant Singh which was also a constant pressure on Gurjant Singh. He was also harassed by the commission agent to return the loan of Rs. 3.82 lakh which he had taken in 2001. Similarly he had taken a loan of Rs. 1.5 lakh from the Bank in the year 1995-96 which accumulated to Rs. 4 lakh. He also got notice from the Bank to return the loan. Thus the pressure to return all these loans was exerting a great mental pressure on Gurjant Singh to commit suicide.

Case 6: Mithu Singh, Age 60 years, Illiterate, Village Sandoha, Block Mour, Date of Suicide 29/05/2001

Mithu Singh committed suicide due to the fraud committed by the commission agent who took loan from the State Bank of Patiala and Land Mortgage Bank, Talwandi by forging the signature of Mithu Singh. The loan from the State Bank Patiala was Rs. 2.33 lakh and from the Land Mortage Bank Rs. 1.50 lakh. commission agent also had given a loan of Rs. 60,000/- in 1998 which has now increased to Rs. 1.25 lakh. The commission agent compelled Mithu Singh to sell his tractor. The commission agent also filed a case for the recovery of loan. It had very deleterious effect on family members in as much as his grand daughter, Simranjeet Kaur developed severe mental tension and left her study.

Today inspite of the suicide by Mithu Singh the whole family is on the throes of serious indebtedness. The family now consist of his two sons, his wife, his daughter-in-law and three grandchildren. Their economic condition is very precarious as much as they cannot manage even the livelihood of the family, what to say about the capacity to return the heavy accumulated loans.

Case 7: I) Sabia Singh, Age 35 years, Date of Suicide March 1998 & II) Nasib Kaur w/o Sabia Singh, Village Harkrishanpura, Block Phool, Date of Suicide March 1999

The reason for committing two suicides in the family is the pressure exerted by the commission agent and the Bank to clear the outstanding loan. The loan from the Commercial Bank was Rs. 1.11 lakh taken 13 years back for the purchase of tractor. Another loan of Rs. 8,000 was taken from Land Mortgage Bank Patiala, 20 years back for purchasing cammel cart and this amount continued to be pending for quite a long time. They also faced series of cotton crop loss due to the attack of the pest American Bollworm. Due to the pressure of the commission agent and Bank to return the loan the couple had to sell 9 acres of land.

Case 8 : Jagraj Singh S/o Tejsingh, Age 42, Village, Harkrishanpura, Block Phool.

For last two decades, Jagraj Singh was under heavy debt. Due to debt burden and pressures from the commission agent, Jagraj Singh committed suicide by consuming pesticides. After his death his brother sold 3 acres of land to clear some of the outstanding loans.

Indebtedness Act for Farmers Likely: Provides for recovery of interest not exceeding principal amount
Punjab farmers may expect some relief with the state government planning to introduce the Punjab Indebtedness Act soon.

The proposed Act has a provision under which financial institutions or moneylenders would be allowed to recover an amount of interest from the farmers not exceeding the principal amount, it is learnt. The provision, if approved, would lighten the burden of farmers and improve the loan recovery process.

Some of the provisions of the proposed Act were expected to be in accordance with Supreme Court recommendations on a related issue and an earlier Act introduced in the '30s by **Sir Chhotu Ram.**

The Act proposes to make it mandatory for Aarhtiyas' to carry out monetary transactions through cheques. All other transactions for grant of loans would be considered illegal. This is expected to make the process of money-lending more transparent and bring moneylenders under close scrutiny.

Farmer representatives feel the Act would improve their lot. "This will help many farmers come out of the vicious debt circle." The Act would also check farmers' exploitation.

Agro-economists feel that the new provisions of the proposed Act were likely to benefit money-lenders and financial institutions in terms of better loan recovery. According to H.S. Shergill, an agro-economist at Punjab University, "such move could give a new direction to the agricultural economy of the state,"

(Kant, 2006)

Victims Mainly Below 30: Report: A report centric to a sub-division in Sangrur district reveals that more than half the farmers who committed suicides in the area were less than 30 years of age. And out of the average 75 suicides committed annually in the sub-division over the years, nearly ten per cent were farmers aged below 20, many even in their teens. The study claims pesticides as the most prevalent mode of suicide by farmers in the segment followed by death by hanging and suicide on the railway tracks.

The report prepared by the Movement Against State Repression (MASR), a human rights organization, has taken into account incidents of suicides as many as 91 villages in the Moonak sub-division (comprising Lehra and Andana blocks) of district Sangrur that took place since 1988. the report was sent to the President of India in January, 2006, said Inderjit Singh Jaijee, the convenor of the MASR.

Out of the 1,360 suicides in the area since 1988, the highest prevalence rate, nearly 41 per cent, has been recorded in the age group of 20 to 30 years.

MSRA's study, which attempts to bring to the fore the high prevalence rate of suicides in the state and seeks compensation for the affected families, has projected details from 11 villages in the sub-division where a high of 365 suicides took place within a radius of 4-km. The MSRA's observations are that the high debt, low profitability and landholdings and a decrease by 20 per cent of the avail able water to farmers was causing suicides.

The MSRA has demanded an exhaustive suicide census to be conducted by an independent agency, besides a relief and rehabilitation package, something on the lines of what the Andhra Pradesh government has given, for the next of kin of suicide victims.

Meanwhile, the Punjab government has assured in the Punjab and Haryana High Court that it had set up a Farmers Commission to probe causes of rural economic distress and determine the relief to be given to the next of kin of suicide victims.

(Dheer, 2006)

Kant, Aditya, 2006, "Indebtedness Act for Farmers Likely", March 6, 2006, Hindustan Times Chandigarh.

Dheer, Gautam, 2006, "Victims Mainly Below 30: Report, 1 April 2006, Indian Express, Chandigarh.

Case 9: Nazar Singh, Age 45, Village Harkrishanpura, Block Phool.

Nazar Singh had 3.25 acres of land which is neither irrigated by tubewells nor by canal water. He hired tubewell water from the neighbouring farmers. He had mortgaged 2.5 acres to the local commercial Bank, State Bank of Patiala, six years back for taking a loan of Rs. 30000/- for agricultural purpose. He received a notice from the Bank to return the loan. He was identified as a defaulter. He had also taken other loans or Rs. 2 lakh from the commission agent, Rs. 20000/- from another commission agent and still another loan of Rs. 10000/- from the 3rd commission agent. He was not been able to return any of these loans. The reasons for not returning the loan is the series of crop loss which he faced over the years. In view of the continuous humiliation he committed suicide in January 2000 by consuming pesticides. At that time he had a boy of 8 years who had to leave his schooling.

Case 10: Hari Singh, Age: 47; Village Harkrishanpura, Block Phool.

Hari Singh S/o Mukhtiar Singh, has debt burden from several sources. He had taken a loan of Rs. 80000/- from Housefed Rampura, 8 years back which increased to Rs. 2 lakh. He received a notice and warrant to return the loan. Another loan of Rs. 95000, he had taken from State Bank of Patiala 6 years back, which he could not return. He had also taken another loan of Rs. 20000/- from the Jhanduke Cooperative Society in 1995 and the amount became double. He had also taken another loan of Rs. 1 lakh from the commission agent. He could not bear the pressure. He committed suicides by hanging himself inside the well. Even after his death the outstanding loan is Rs. 4 lakh.

Case 11: Harcharn Singh, Age 35, Village Javeensinghwala, Block Talwandi, Date of Suicide 12/05/03.

Harcharan Singh committed suicide due to the debt burden taken from commission agent amounting to Rs. 13,000/- taken in the year 2003. The commission agent pressurized him to clear the loan and for this purpose 20 quintals of wheat were confiscated by the commission agent from the field which was a very cruel tactics adopted. This left a very deep mental scar on Harcharan Singh. He immediately hanged himself by tying rope round the neck. The family is very badly effected by the death of Harcharan Singh. The surviving family members include his old father, mother, his wife and two minor children.

Case 12: Malbeet Kaur, Age 36, Village Harkrishanpura, Date of Suicide 2001.

Malbeet Kaur committed suicide due to pressure of loans from housefed and the commission agent. The loan from the housefed was Rs. 1 lakh borrowed 6 years back of which Rs. 50,000 was returned and Rs. 2 lakh still remained to be cleared. The loan from the commission agent was Rs. 10,000 taken in 2004. She received notice from the housefed to return the loan and the commission agent also exerted pressure to return the loan. In order to clear the loan, she sold 4.5 acres of land to one local farmer and another 6 acres to another farmer. Still the outstanding loan consist of Rs. 70,000 from State

Bank of Patiala, besides the loan from the relative amounting to Rs. 50,000.

Case 13: Karnail Singh, Age 60, Village Gill, Date of Suicide 01/06/1998.

Karnail Singh committed suicide due to loans from commission agent, Bank and Cooperate Society totaling to more then twelve lakh. Due to heavy debt burden and also threat from the Bank to set family member arrested, compelled Karnail Singh to consume poison.

MANSA

Case 14: Gurjant Singh, Age 34, Village Chak Ali Sher, Block Budlada.

Gurjant Singh committed suicide by consuming pesticides during August 2001 at 6 p.m. He committed suicide because of economic hardship and debt burden. He had taken loan from the Bank and commission agent. He had to sell the land for clearing the loan which had heavily pre-occupied his mind. He had taken loans from Punjab National Bank, Cooperative Society, Commission agent and relatives totaling Rs. 7.50 lakhs.

Case 15: Sohan Singh, Age 50, Village Tamkot, Block Budlada.

Sohan Singh of village Tamkot, committed suicide during April 2005, at 7.00 p.m., in the village by consuming pesticide. He had taken the loan of Rs. 40,000 in 1995 from Bank and Rs. 80,000 from commission agent. But unfortunately he failed to returns the loan. The commission agent got 1.5 acre land mortgaged in his name in lieu of the payment of interest.

Case 16: Jagraj Singh, Age 33, Village Burjhari, Block Mansa.

He committed suicide in October, 2002. The debt burden of Rs. 45,000 plus interest is still an anxiety for the family mebers as both the commission agent and relatives are pressurizing them to return the loan. There are no male earners in the family.

Bhardwaj, Ajay, 2005, "Another Punjab Farm Suicide," 19 October, 2005, Time of India, Mumbai.

Bhardwaj, Ajay, 2006, "Another Dead Ridden Farmer and Life", DNA 20 April, 2006, Mumbai.

Another Punjab Farm Suicide

Yet another farmer, Harmit Singh, 45, hanged himself to death in Singo village in Bathinda district on Monday after his cotton crop fetched him too low a price.

He was under heavy debt and had recently sold eight acres of his land to pay off part of his loans to banks and commission agents. His family members told the police that he still owed Rs 6 lakh as debt.

Harmit is the third farmer to commit suicide in the state in the last few days. Earlier, Gurdev Singh had hanged himself to death in Kapurthala district after the procurement agencies had failed to buy his paddy yield for more than a fortnight. Later, Sukhdev Singh ended his life in the same district in the face of mounting debts on him. (Bhardwaj 2005)

Another Debt-Ridden Farmer Ends Life in Punjab

Gurandiatta Singh a midsized farmer in Kot Shammi village in Bathinda distric, committed suicide on Tuesday by consuming insecticide as he could not clear his debt of Rs 80,000.

Earlier, another farmer, Tarlochan Singh, burdened by a Rs six lakh debt, had jumped before a running train in Dandpur village in Khanna and ended his life. About a fortnight back yet another farmer had committed suicide for failing to cope with mountin debt burden.

Reeling under heave debt, farmers in Punjab have found little solace in the sale of wheat produce, which in the normal course helps them rid the debt burden partially.

Farmers in the state own an estimated Rs 24,000 crores as debt to various financial institutions like cooperative and commercial banks and commission agents. More than 20,000 farmers have reportedly committed suicide during the last ten years or so.

The chief minister had requested the Centre to help the state farmers overcome the unusual crisis. At a high-level meeting here on Wednesday, chief secretary KR Lakhanpal directed senior revenue department officials to work out ways in which the government can help them. (Bhardwaj 2006)

Case 17: Sewak Singh S/o Hardev Singh, Age 20, Village Burjhari, Block Mansa.

Sewak Singh committed suicide during 1997 by consuming pesticide in the house itself because of extreme pressure from the commission agent to return the loan. The commission agent had taken 2 acres land. This was a great pressure on Sewak Singh which compelled him to commit suicide.

Even now the following loan amount is due against the family :-

1. Bank loan of Rs. 35,000 taken in 2000 from Lead Bank. Current amount is Rs. 93,000 plus interest.
2. Cooperative Society loan of Rs 5000 taken in 2003; it has now become Rs. 10,000.
3. Loan from commission agent of Rs. 2 lakh taken in 1995 at 24% interest: in lieu of the loan 2 acre land was sold to the commission agent.

Now the family is left with one acre land.

Case 18: Jaspal Singh, Age 42, Village Burjhari, Block Mansa

Jaspal Singh committed suicide on 23rd July 2003 by consuming pesticide in the field. The main reason for his committing suicide was the loan burden. His loan amount was as follows :

1. Bank loan of Rs. 1.50 lakh, returned one installment, still the principal plus interest is outstanding.
2. Cooperative Society loan of Rs. 20,000, returned.
3. Loan from commission agent of Rs. 1.50 lakh, suraj bhan; the interest amount is returned every year but the principal amount remains intact.

Case 19: Chamkaur Singh, Age 25, Village Gurne Kalan.

He took a loan of Rs. 1.47 lakh from a commission agent in the year 1990 at 24% interest. He had returned Rs. 45,000 but could not return the remaining amount. He had also faced crop loss and low yield of wheat crop. The loss of job from sugar mill had also adverse impact on his mind. All these factors compelled him to consume pesticide

Case 20: Harpal Singh, Age 18, Village Gurne Kalan, Block Budlada.

He had taken a loan of Rs. 70,000 in 1995 for inducting tube well. Another loan of Rs. 1.50 lakh was taken from House fed. He returned the Bank loan of Rs. 70,000 but the House fed loan of Rs. 1.50 lakh remained to be paid. Thus due to heavy loan and poor economic condition, he consumed pesticide in December 2000 and committed suicide.

Case 21: Leela Gir S/o Chotta Gir, Age 20, Village Gurne Kalan, Block Budlada.

The loan amount contracted by Leela consisted of Rs. 25,000 taken in 1995 from commission agent at 24% interest of which Rs. 10,000 remained to be paid. This loan was taken for the purpose of agriculture and household use.

The economic problems and lack of adequate income forced him to commit suicide in November 1998.

Case 22: Chintan Singh, Age 35, Village Bodowal, Blcok Budlada.

Chintan has taken Rs. 35,000 from commissioin agent in 2004.

Another loan of Rs. 70,000 was taken from another commission agent for purchase of tractor at 24% interest. He could not return the amount. In order to return some of the loan he had to sell his agriculture implement like tractor and thresher. Still he could not clear the loan. So ultimately he consumed pesticide in the field on 21st April 2004. The pressure of commission agent was also instrumental in his committing suicide.

Case 23: Gurchran Singh, Age 18, Village Chak Ali Sher, Block Budlada

In view of the loan from the Bank and commission agent, there was constant pressure to return the loan, particularly from the commission agent. The humiliation by the commission agent was so severe that the crops and the tractor was taken away by the commission agent. He could not face the threat and the wrath of the commission agent and so he took pesticide and committed suicide on 28th November 1995.

Case 24: Makkhan Singh, Age 35, Village Malsinghwala, Block Budlada.

Makkhan had taken a Bank loan of Rs. 30,000 in 1998, Rs. 50,000 from Cooperative Society and Rs. 20,000 from commission agent.

There was no source to clear the Bank loan and the loan from commission agent. The land has to be sold for partly clearing the loan. The loan was still hanging on his head and so Makkhan Singh consumed pesticide in the morning on 25th January 2006 and committed suicide.

Case 25: Tarsem Singh, Village Chakalisher, Block Budlada.

Tarsem had accumulated a loan of more than Rs. 8 lakh, mainly from the commission agent. He sold 3 acres to clear the loan in 1999 but still a large amount remained to be paid. He committed suicide by consuming pesticide.

Case 26: Pritam Singh, Village Chak Ali Sher, Block Budlada.

Pritam Singh had taken huge loans from various sources. The commission agent threatened him several times to return the loan. He took away his tractor, trolley, and two buffalo during 1993-94. As a result of this kind of humiliation he committed suicide during November 1995.

Case 27: Gurchran Singh, Age 60, Village Malsinghwala, Block Budlada.

Gurcharn Singh committed suicide during February 2006 by consuming pesticide. He had taken the following loans:-

1. A loan of Rs. 30,000 from Land Mortgage Bank in 1998, he could not return the loan and got a notice from the Bank.
2. Loan of Rs. 50,000 from Cooperative Society in 2005.
3. Loan of Rs. 20,000 from the commission agent in 2002 at 24% interest.

65 per cent Punjab Farmers Under Debt : Expert
For Punjab farmers, the harvest festival of Baisakhi is no longer an occasion to celebrate as 65 per cent of them are under debt with per farmer debt reaching Rs. 45,000 and private money lenders charging high interest rates, ranging from 18 to 24 per cent.

"This is the highest per farmer debt in the country. This is the state that is considered as the grain bowl of the nation. What is happening in the state, where Green revolution occurred, needs to be pondered and solutions need to be found, otherwise it would lead to a grave situation across the country," says Prof. Sucha Singh Gill of Punjabi University, Patiala.

Nearly 36 percent of the state peasants wanted to discontinue farming as it was not profitable, because of low return from the farmland after intensive capital input.

Among those, for reasons of poor profitability, 73.71 per cent of the peasants in the state are not liking farming compared to 66.08 percent across the country. While farmers outside the state face the risk factor, which is around 20.70 per cent, this factor is only 6.23 percent in the state, clearly reflecting the low productivity and high input costs.

With factors such as productivity of land going down, increased fragmentation of land, cost of inputs like fertilizers and irrigation rising and no increase in the minimum support price of food grains, the real income of farmers has dipped considerably. Most farmers in the state feel cultivation is no longer a viable option, particularly because 76 percent of them are small and marginal farmers with landholding less than five acres in size.

Saying that the number of farmer suicides because of increasing debt was between 2,500 and 5,000 during the past 10 years, Prof. Gill cautioned that the situation would reach an alarming stage unless effective corrective measures were taken immediately. (Tribune, 2006)

Case 28: Jagtar Singh, Age 35, Village Gurne Kalan, Block Budlada.

He had taken a loan of Rs. 40,000 from PNB and another loan of Rs. 50,000 from commission agent at the rate of 24% interest. Due to economic reason he was not able to clear the loan and as a result he was compelled to be confined with in his house for two months and after that he committed suicide.

Case 29: Mithusingh, Age 70, Village Tamkot, Block Mansa.

He has taken a loan of Rs. 1.5 lakh from the commission agent at 24% interest. He sold all the crops to the commission agent and cleared his entire loan. After clearing all the loans, he went to collect fresh loan from commission agent but commission agent the refused which demoralized Mithu Singh. He returned home and consumed pesticide.

SANGRUR

Case Study 30 : Rupa Singh, Age 25, Village Chotian, Block Lehragaga.

He had taken a loan of Rs. 50000/- from the commission agent in 1998 and was under pressure from the commission agent to clear the amount. So he sold ½ acre land to repay the loan. He could not bear the loss of ½ acre land and so he threw himself before a running train. He was seriously injured and taken to Lehragaga hospital, but due to serious injury he died after few hours.

Case Study 31 : Nafeh Singh, Age 30, Village Bhulan, Block Andana

Nafeh Singh had taken loan of Rs. 80,000 from govt. and commission agent and committed suicide during the year 1999 by consuming pesticides. He had been under stress because of acute poverty and debt burden.

Case Study 32 : Prem Singh, Age 18, and Nishan Singh, Village Bhulan, Block Andana.

Due to the pressure exerted by the commission agent Prem Singh jumped before the running train and committed suicide. His age was only 18 when he committed suicide. Nishan Singh the younger brother of Prem Singh was also

Tribune 2006, "65 Percent Punjab Farmers Under Debt: Expert", 16 April, 2006, New Delhi.

pressurized by the commission agent to return the loan. He also committed suicide 7 years later by consuming pesticides.

Case Study 33 : Surjeet Singh, Age 32, and Angrez Singh, Age 30, Village Dhindsa, Block Lehragaga.

Surjeet Singh was working both as a cultivator and agricultural laborer. He had a debt burden of Rs. 50,000 from the commission agent taken in 1990 at 30% interest which he could not repay. He had also taken another loan of Rs. 60,000 from Commercial Bank in the same year. Surjeet Singh had no resources to return the loan. He felt very uncomfortable and committed suicide by consuming pesticide. The loan continued and the entire burden fell upon Angrez Singh. He also found himself unable to clear the loan and was forced to commit suicide.

Case Study 34 : Kapuri, Age 32, Village Bhutal Kalan, Block Lehragaga.

The main reason for Kapuri committing suicide was the poor economic resources of the family and the debt burden of Rs 70,000 taken from commission agent in 1996 at 30% interest and another loan of Rs. 5,000 taken from the Bank in 1997. both the loans remained unpaid. Family had to sell the ½ acre of land and became landless in the process of clearing the loan.

Case Study 35 : Pita Singh, Age 18, Village Gurne Kalan, Block Lehragaga.

The loan taken by him consists of Rs. 1 lac from the LMB taken in 2004, another loan of Rs. 50,000 from Cooperative Bank, taken in 2004 and yet another loan of Rs. 1 lac taken from commission agent. In view of the economic problem and loan burden, Pita Singh committed suicide in February 2001 by consuming pesticide.

Case Study 36 : Krishan Singh, Age 27, Village Bhulan, Block Andana, Date of Suicide 11 Feb, 2004.

Krishan Committed suicide by hanging himself on 11th February 2004. the main reason of his committing suicide was the debt burden and the bad economic condition of the family. He had taken a loan of Rs. 30,000 from Cooperative Society in year 2001 which he could not return. This was a great mental pressure on him which lead him to committing suicide.

Case Study 37 : Raghubir Singh, Age 28, Village Bhulan, Block Andana, Date of suicide 20 April, 2004.

The reason of his suicide was economic hardship, debt burden and crops loss. He had received a notice from Bank to return the loan. As a result 2 acres of land was mortgaged and the debt of Land Mortgage Bank was partly cleared. Another debt of Rs. 1 lac was taken from SBI, 8 years back for construction of Borewell. Another loan of Rs. 1.25 lac had been borrowed from the Cooperative Society, 4 years back, as an agricultural crop loan. Yet another loan of Rs. 80,000 was borrowed from commission agent 11 years back @ 24%. The commission agent takes the produce in lieu of the interest and the principal amount is till intact.

Village in Punjab Puts itself Up for Auction: Heavy debt forces residents of Malsinghwala village to put its 1800 acres on sale

Malsinghwala, a tiny village in Punjab's Mansa district, has put itself up for auction. Lock, stock and barrel, states a resolution passed unanimously by residents.

A brief halt reveals just why its people have decided to throw in the towel. "The mountain of debt has left us crushed. Every villager here is loaned to the hilt, all 1800 acres of Malsinghwala are up for sale." Says sarpanch Jasbir Singh.

The village – or *bikaoo pind* as its known now – owes more than Rs. 5 crore to Banks and another Rs. 2.5 crore to private moneylenders and commission agents. Split up the debt across 4,000 residents, including the kids, and it works out to a debt of Rs. 13,000 per head. A mind-boggling sum to repay.

But how did it all add up? "Call it destiny or government's in difference. Our village is located at the tail end of the irrigation canal so we never get enough water, the result is crop failure year after year. Just take a look at our fields. More than 750 acres are barren as there's no water and on the rest, we grow cotton or pulses. Paddy can fetch us more money but there's little chance of it with irrigation water so scarce. There isn't any water to drink either. The bore water has so much fluoride that it's virtually undrinkable but we don't have a choice." Says a villager According to government official 'this is just a publicity gimmick.' Irate villagers, however, strongly refute the charge. "Can we be happy that our village has come to such a state? Harkrishanpura village did the same thing earlier and today, no one is willing to give their daughter's hand in marriage to their youths. This was a last-ditch attempt at making ourselves heard," says the sarpanch. (Raj 2005)

Case Study 38 : Jasbir Singh, Aged 19, Village Chotian, Block Lehragaga, Date of Suicide 26 October, 1995.

He was deeply worried to clear the loan of the commission agent. He was pressurized by agent to return the loan. Jasbir Singh had borrowed a sum of Rs. 1.5 lac in 1990 from this commission agent at 24% interest. The loan accumulated was Rs. 3.50 lacs. As a result Jasbir committed suicide.

Case Study 39 : Satur, Age 18, Village Bushera, Block Andana.

The main reason of his committing suicide is economic problem and the debt burden. He had taken a loan Rs. 1.30 lac from local commission agent during March 2005 @ 30% interest for agricultural purpose. The amount forced him to consume pesticides and committed suicide on October 2005.

Case Study 40 : Pritam Das, Age 60, Village Gurne Kalan, Block Lehragaga, Date of suicide 11 Feb, 2006.

He had taken a loan of Rs. 35,000 from the commission agent in 1980 for agriculture work. Another loan of Rs. 49,000 was contracted. Pritam Das committed suicide on 11 Feb, 2006

Case Study 41 : Ram Kumar, Age 43, Village Bhulan, Block Andana.

Ram Kumar, consumed pesticides and committed suicides in 1991. He had taken a loan of Rs. 80,000 from the Cooperative Bank in 1989. The interest accumulated over the years. He had also taken another loan of Rs. 20,000 from commission agent at 18% annual interest. The commission agent approached Ram Kumar several times to clear the loans. Unable to bear the pressure of the agent commission agent and humiliation, he consumed pesticides.

Case Study 42 : Ran Singh, Age 27, Village Dhindsa, Block Lehragaga.

Ran Singh faced crop loss continuously for years and consequently he has the debt burden of Rs. 70,000 at 30% interest which he could not return. Due to the pressure from the commission agent he consumed pesticides and committed suicide in 1998.

Raj, Neelam 2005, "Village Puts Itself Up for Auction" Times of India, 1st August, 2005 New Delhi.

Case Study 43 : Dharmveer, Age 35, Village Banga, Block Andana.

Dharamveer had taken a loan of Rs. 1 lakh from the commission agent in 1993 at 30% interest which he could not return. As a result 2 acres of his land were mortgaged with the commission agent for six years. There was also another heavy debt of Rs. 2 lakh taken from the villagers at 30% interest which he could not clear. This was a great mental pressure on him which forced him to commit suicide by burning himself.

Suicides of Farmers in Sangrur District, Punjab

1994 to 1998

Village Chotian, Population approx : 3000

S.N.	*Name*	*Age*	*Year*	*Year Occupation*	*Cause*
1.	Mithu Singh S/o Sita Singh	27	1994	Agriculture	P
2.	Satpal Singh S/o Muktiar Singh	22	1994	Labour	H
3.	Sukhdev Singh S/o Chand Singh	45	1994	Agriculture	P
4.	Lala Singh S/o Cheta Singh	22	1994	Agriculture	A
5.	Raj Singh S/o Hari Singh	25	1995	Agriculture	P
6.	Mithu Singh S/o Sukhdev Singh	38	1995	Service	P
7.	Surinder Kumar S/o Panna Lal	40	1995	Agriculture	D
8.	Sant Ram S/o Roldoo	24	1996		
9.	Kale Khan S/o Sum-ul-din	28	1996	Labour	P
10.	Jaisir Singh S/o Gurdev Singh	21	1996	Agriculture	P
11.	Labh Singh S/o Banasi Das	23	1996	Labour	P
12.	Natha Ram S/o Kani Ram	40	1997	Labour	P
13.	Bhola Singh S/o Jagga Singh	30	1997	Labour	T
14.	Mitha Singh S/o Rasala Singh	32	1997	Labour	H
15.	Mangh Singh S/o Ralla Singh	25	1997	Agriculture	P
16.	Gurdev Singh S/o Mukand Singh	40	1997	Service	H
17.	Bhola Singh S/o Sarup Singh	30	1997	Agriculture	P
18.	Janta Singh S/o Hira Singh	25	1997	Labour	H
19.	Kala Singh S/o Mukhtiar Singh	23	1997	Agriculture	?
20.	Sukhdev Singh S/o Bana Singh	40	1997	Labour	P
21.	Niranjan Singh S/o Amar Singh	35	1997	Agriculture	P

Village Bangan, population approx. 3000

S.N.	*Name*	*Age*	*Year*	*Year Occupation*	*Cause*
1.	Prithi S/o Mangoo	29	1994	Labour	H
2.	Raja (Geja) Singh S/o Chanderbhan	25	1994	Agriculture	H
3.	Satbir Singh w/o Jagar Singh	27	1994	Agriculture	P
4.	Duni Kaur w/o Chanderbhan	60	1995	Agriculture	?
5.	Karnail Singh S/o Manga Ram	22	1995	Labour	P
6.	Bholaram S/o Sampath Singh	24	1996	Agriculture	H
7.	Bahurti w/o Dalbara	28	1996	Agriculture	B

8.	Jangir Singh S/o Mukhtiar Singh	36	1996	Agriculture	P
9.	Balbir Singh S/o M. Ram	23	1996	Agriculture	H
10.	Dharmvir S/o Hari Krishan	34	1997	Agriculture	B
11.	Mohinder Singh S/o Jeeruram	23	1997	Agriculture	P
12.	Reshma w/o Gaini Singh	24	1995	Agriculture	P
13.	Ratia S/o Tara Singh	27	1998	Agriculture	B
14.	Savianram S/o Sivnath	60	1998	Agriculture	T
15.	Bira S/o Tara Singh	30	1998	Agriculture	B

Village Balran, population approx. 10000

S.N.	*Name*	*Age*	*Year*	*Year Occupation*	*Cause*
1.	Gurtej Singh S/o Shera Singh	18	1995	Agriculture	H
2.	Pala Singh S/o Khushiram	24	1995	Agriculture	P
3.	Mehar Singh S/o Ganda Singh	28	1995	Labour	P
4.	Sita Singh S/o Mohinder Singh	24	1995	Labour	P
5.	Gurcharan Singh S/o Kehar Singh	24	1995	Agriculture	P
6.	Bhola Singh S/o Ruliaram	24	1995	Labour	P
7.	Lady	27	1995	Labour	P
8.	Baghail Singh S/o Mithu Singh	26	1995	Agriculture	P
9.	Kirpal Singh S/o Dhan Singh	20	1996	Agriculture	P
10.	Bhola Singh S/o Mehar Singh	24	1996	Labour	P
11.	Gurcharan Singh S/o Nabha Singh	19	1996	Agriculture	P
12.	Ranbir Singh S/o Ruldu Singh	22	1996	Agriculture	P
13.	Jeet Singh S/o S. Singh	20	1996	Agriculture	P
14.	Sehnsi Singh S/o Balhar Singh	24	1996	Agriculture	P
15.	Bhola Singh S/o Saon Singh	20	1996	Agriculture	P
16.	Ganpati w/o Ker Singh	42	1996	Agriculture	P
17.	Sukhar Singh S/o Balhar Singh	30	1996	Agriculture	P
18.	Aki d/o Gurmail Singh	19	1996		P
19.	Gejha Singh S/o Sohan Singh	24	1997	Labour	P
20.	Pithu Singh S/o Puran Singh	25	1997	Agriculture	P
21.	Kaka Singh S/o Gumdoor Singh	23	1997	Agriculture	P
22.	Telu Singh S/o Gurdial Singh	24	1997	Labour	P
23.	Kala Singh S/o Karnail Singh	24	1997	Labour	H
24.	Tota Singh S/o Jaseer Singh	25	1997	Labour	P
25.	Desraj S/o Labh Singh	22	1997	Labour	P
26.	Lady w/o Kuldip Singh	28	1997	Labour	P
27.	Mithu Singh S/o Bugher Singh	26	1997	Agriculture	P
28.	Karnail Singh S/o Dhana Singh	35	1997	Agriculture	P

Village Bakhora Kalan, Population approx. 3500

S.N.	*Name*	*Age*	*Year*	*Year Occupation*	*Cause*
1.	Naib Singh	25	1994	Agriculture	B
2.	Parmi Singh	23	1996	Labour	P
3.	Virsa Singh	30	1995	Agriculture	?
4.	Kulvinder Singh	26	1995	Labour	H
5.	Bhola Singh	30	1995	Labour	T
6.	Rampal Singh	33	1996	Labour	H
7.	Satpal Singh	24	1996	Labour	P
8.	Shingara Singh	20	1998	Agriculture	H
9.	Ram Singh	23	1998	Agriculture	B
10.	(illegible) S/o Bant Singh	15	1994		T
11.	Gurmail Kaur w/o Niranjan Singh	30	1997	Labour	B

Village Chural Kalan, Population approx. 4000

S.N.	*Name*	*Age*	*Year*	*Year Occupation*	*Cause*
1.	Jarnail Singh S/o Prabhudayal	20	1996	Labour	
2.	Bhola S/o Naik	21	1995	Labour	
3.	Charan Singh S/o Gujar	60	1997	Labour	
4.	(illegible) S/o Ramdasia	15	1997	Labour	
5.	Gachar S/o Bachan Singh	19	1996	Labour	
6.	Milkhi Singh S/o Jagir	30	1995	Agriculture	
7.	Ram Singh S/o Sukhdev Singh	16	1997	Labour	
8.	Surmi w/o Dhan Singh	20	1997	Agriculture	
9.	Gurbachan S/o Jit Singh	32	1997	Service	
10.	Magan Singh S/o Arjan Singh	40	1997	Labour	

Village Bushehra Population approx. 3000

S.N.	*Name*	*Age*	*Year*	*Year Occupation*	*Cause*
1.	Bachni w/o Bhana Ram	30	1994		P
2.	Mukhtiar Singh S/o Mehar Singh	35	1994		H
3.	Niranjan Singh S/o Moman	30	1995		P
4.	Juga Singh S/o Ram Singh	60	1996		H
5.	Kartara S/o Jagga Ram	60	1996		H
6.	Bhola S/o Fateh Singh	19	1996		H
7.	Karnail Singh S/o Mukand Singh	28	1997		P
8.	Puran S/o Baru Ram	30	1998		H

Source : *Inderjeet Singh Jaijee, Convener, Movement Against State Repression, Chandigarh.*

Abbreviation Key:
B - burns
H - hanging
P - pesticide
T - under a train
D - Drowning

Conclusion

India has once before been colonised through cotton. From being the biggest producer of the cotton and the cotton textiles, India was converted into the biggest market for textile produced by the British industry.

Today cotton colonisation is not restricted to the cotton textiles but goes deeper into the colonisation of the cotton seeds. From being the country of origin and the centre of diversity India is being rapidly reduced to dependence on imported cotton seeds.

Freedom from the first cotton colonisation was based on liberation through the spinning wheel. Gandhi's use of the charkha and the promotion of khadi was both a form of resistance to the British monopoly on cloth and a reminder that it was in our hand to make our own cloth again.

Freedom from the second cotton colonisation needs to be based on liberation through the seed. Indigenous seeds are still available in large parts of India. Organic cotton is promising to become a major route to prosperity for farmers in marginal and rainfed areas. The freedom of the seeds and freedom of organic farming are simultaneously a resistance against monopolies of corporation like Monsanto and a regeneration of agriculture that brings fertility to the soils and prosperity to the farmers.

The seeds of suicide need to be replaced by seeds of prosperity. And those seeds should be in the hands of our farmers and not in the hands of corporations.

Statement showing the details of suicide cases of farmers in Warangal Districts (Between Dec. '97 and Jan. '98)

S. N.	Name of the deceased	Date of death	Particulars of Survival & Age	Area of land (Acre) Own	Lease	Crops Grown	Outstanding Debts	Type of Soil	Irrigation details	Designation of Enquiry Officer	Reasons for death
1	2	3	4	5		6	7	8	9	10	11
1.	Manupally Saraiah S/o. Mallaiah, R/o, Managapet, Mangapet Mandal.	12-12-97	Father - 63 Mother - 45 Wife - 25 Daughter - (2) Son - 1 1/2	2.00	—	Chillies-Nursery-0.10 Tobacco-Nursery-0.10	20,000/- Private	Sandy Loam	Nil	Dy. Director of Agriculture (FTC), Warangal	Overburdening of Loans on Crop failure.
2.	Lakkavarsu Mogili, S/o. Komuraiah, R/o, Kamaram, Athmakur Mandal	19-12-97	Father - 65 Mother - 55 Wife - 25 Son - 13 Daughter - 10	3.00	2.00	Cotton	85,000/- Private 20,000/- from Society in the past	Chalkas	Dried up Well	Dy. Director of Agriculture (Trg)	Due to crop failure.
3.	ChaparthyVeeraSwamy S/o.Doodaiah (v)Chintalapally Sangem Mandal	25-12-97	Wife - 25 Daughter - 6 " " - 5 Son - 3	4.00	—	Cotton- 1.20 Paddy- 1.00	60,000/- Private	BC Soil	Well without Water	D. D. A (Agro.)	Crop failure.
4.	Bandi Kalavathi, W/o, Somaiah, 45Y, R/o.Venkatapur Zaffargadh	18-12-97	Husband - 48 Daughter - 22 " " - 13 " " - 13 " " —	—	5.00	Cotton- 4.00	31,500/- Private	Redchalka	Dried Well	Asst. Director Agriculture (R) Ghanpur	Overburdening of debts.
5.	Samala Mallaiah, S/o, Somaiah, 40y, (V) Nagaram Parkal Mandal	21-12-97	Wife - 35	1.00	2.00	Cotton- 3.00	70,000/- Private	—	—	Agriculture Officer Parkal mandal	–do–
6.	Janga Ravi, S/o, Sammaiah, 30y, (V) Venkatapur Parkal Mandal	22-12-97	Mother - 50 Wife - 25	2.00	—	Cotton- 1.20 Paddy- 0.20	20,000/- Private 5000/- Cooperative	—	—	-do-	-do-
7.	Vynala Sambaiah, S/o. Komuraiah, (V) Keshavapuram Duggondi Mandal	24-12-97	Wife - 35 Daughter - 20 Son - 18 Son - 15	1.00	3.00	Cotton- 3.10 Jowar- 0.20	3,000/- Coop--rative 1,00,000/- Bank	Black Alkaline & Sandy loam	Dried Well of Agril., Narsampet	Asst. Director	-do-

1	*2*	*3*	*4*	*5*		*6*	*7*	*8*	*9*	*10*	*11*
8.	Naugari Kishan Rao S/o.Rajanna, Age: 30, (V)Yelukurhi (H) Geesugonda Mandal	15-12-97	Grand mother Mother Father Sister	4.00	—	Cotton- 3.00 Chillies- 1.00 1,00,000/- Private	30,000/- from Government	BC	No Irrigation	D.D.A (Agro.)	Crop failure.
9.	Kommula Mallaiah S/o. Kankaiah, R/o, Peddapuram, Athmakur Mandal	23-12-97	Father- 65 Wife - 35 Daughter - 22 ″″ - 18 ″″ - 15 ″″ - 12 ″″ - 09 Son - 05	0.10	—	Maize- 0.10 Cotton- 2.30 Chillies-1.00	70,000/- Private	Sandy Loam	Well	-do-	Overburdening of debts and Crop failure.
10.	Nellutla Ravi, S/o, Laxmaiah, 25 Y, (V) Kamaram, Athmakur Mandal	16-12-97	Mother - 55 Wife - 20 Daughter -	3.00	—	Cotton- 3.00	25,000/- Bank 2,25,000/- Private	Red chalka	Dried Well	D.D.A (Agro.)	1. Over-burdening debts, 2. Loss Money lending.
11.	Kanugula Sambaiah, S/o, Papaiah, Age: 50, (V) Shambaiahpally Duggondi Mandal	29-12-97	Wife - 38 Daughter - 20 ″″ - 18 Son - 15 Son - 3	3.00	0.15	Cotton- 2.15 Paddy- 1.00	5,000/- Cooperative 18,000/- Private	Sandy loam	Well Narsampet	A.D.A (R)	1. Mental Worries, 2. Overburdening of debts, 3. Crop failure.
12.	Banothu Mangya S/o. Mourya, Age: 50 (V) Nandanayakthanda (H) Vishwanathpur Geesugonda Mandal	29-12-97	Wife - 45 Daughter - 18 ″ - 14 ″ - 12 Son - 21 ″ - 17	1.20	2.00	Cotton - 3.00 Vegetables- 0.20	50,000/- Private	Red Chalka	Dried Well	D.D.A. (Agro.)	1. Crop failure, 2. Overburdening of debts.
13.	Kannepally Mallaiah S/o, Odelu, 35Y, (V) Keshvapur Venkatapur Mandal	29-12-97	Father - 70 Mother- 60 Wife - 33 Daughter - 13 ″ - 3	0.30	1.00	Cotton- 1.00 Paddy- 0.30	19,000/- Private	BC	Kunta	D.D.A, (FTC)	1. Overburdening of debts, 2. Crop failure.
14.	Ajmera Surya S/o, Kasna, 42Y, R/o, Narayan thanda H/o, Thimmampet, (M) Duggondi	30-12-97	Wife - 38 Son - 20 ″ - 18 Daughter- 15	4.00	—	Cotton- 3.00 Chillies- 1.00	80,000/-	Loany & Dubba	Well (Insufficient water)	A.D.A (R), Narsampet	1. Heavy debt. 2. Crop failure.

1	2	3	4	5		6	7	8	9	10	11
15.	Mankena Yella Reddy S/o, Chandra Reddy, 25Y, R/o, Veldanda Narmett Mandal	30-12-97	Wife - 20	2.25	—	Cotton- 1.00	30,000/- Private	Red	Rain fed chalka	A.D.A. Jangaon	Debt burden
16. e to	Akula Jagnaiah S/o, Venkataiah, 44Y, R/o, Mallikudurla Dharmasagar Mandal.	03-1-98	Wife - 40	—	2.00	Cotton 1.00 Chillies 1.00	5,000/- SBH 41,500/- Private	Red chalka	Dried Well	A.D.A., Ghanpur	1. Chillies & Cotton Crops Failure du lack of water, 2. Heavy debt.
17.	Ijjagiri Rajabhadraiah S/o, Mallaiah, Age: 28, R/o, Papaiahpalli, H/o, Narasapur Venkatapur Mandal	04-1-98	Father - 57 Wife - 25 Daughter - 5, ″ - 2	3.00	4.00	Paddy- 0.20 Chillies 1.00 Sunflower 2.00 Maize 2.00	50,000/- Private	B.C.	Well	D.D.A., (F.T.C.)	Crop failure.
18.	Banoth Swamy, S/o, Sethaiah, Age: 28 R/o, Banchari Thanda H/o, Gollapalli, Gudur Mandal	8-1-98	Wife - 24 Daughter - 9 ″ - 2 Son - 6	1.32	—	Cotton 0.30 Chillies 1.00 Mahabubahad	20,000 Private	Red Chalka	Well	D.D.A (Trg.) A.D.A.(R);	Crop failure and heavy debts.
19.	Gundrati Bikshapati S/o, Ilaiah, Age: 23, R/o, Pegadapalli Hasanparthi Mandal	6-1-98	Father - 50 Mother - 45 Wife - 18	2.00	—	Cotton 2.00	55,000/- Private	B.C	Well	A.D.A.(R); Warangal	Crop failure & debt burden.
20.	Neereti Narsaiah, S/o, Yellaiah, Age: 23, R/o, Bairanpalli Maddur Mandal	13-1-98	Father Mother Brother	3.30	3.00	Chillies 1.00 Maise 1.20 Paddy 0.20 Redgram 0..20 Jowar 0.10	16,600/- Bank	Chelka	Bore Well (failed)	A.D.A., (R) Jangaon	Crop failure & heavy Debts.
21.	Bollakonda Jag-ham, S/o, Ayodya, Age: 50, R/o, Serols, Korvi Mandal	15-1-98	Wife - 45 Son - 25 Son - 20	14.00	—	Cotton 1.20 Chillies 1.00 G'nut 3.00 Redgram 4.00 Paddy 2.00	20,000/- Bank 70,000/- Private	Red	Well Chelka	A.D.A (R) Mahabubabad & A.D.A, (STL), Warangal	Crop failure & heavy debts.
22.	Nune Ramaswamy S/o, Komraiah, Age: 40, R/o, Mulug	16-1-98	Wife - 35 Son - 17 Daughter - 13	1.30	2.00	Coton 2.00 Paddy 1.30	50,000/- Private	B.C.	No Well	A.O., Mulug	1. Crop failure, 2. Loss in side business.

1	*2*	*3*	*4*	*5*		*6*	*7*	*8*	*9*	*10*	*11*
23.	K. Anjaiah, S/o, Mallaiah, R/o, Chitur, L. Ghanppur Mandal	10-1-98	Wife - Daughter Son	4.00	0.50	Caster & Redgram 4.00 Paddy 0.50	—	Red Chelka	Open Well	A.D.A, (R), Jangaon	—
24.	Pendle Anjaiah, S/o, Venkataiah R/o, Dharmaraopet Khanapur Mandal	12-1-98	—	1.20	—	Cotton- 1.10 Paddy- 0.10	30,000/- Private	—	—	M.R.O., Khanapur	Due to debts.
25.	S. Anandam, S/o, Yakaiah, R/o, Kadaver, Devaruppula Mandal	5-1-98	—	—	—	—	—	—	—	R.D.O Jangaon	—
26.	G. Yellaiah, Age: 52, R/o, Kogilvai, Atmakur Mandal	15-1-98	—	3.00	—	—	60,000/- Loans	—	—	Based on daily News Paper Dated 17-1-98	Crop Loss.
27.	Smt. Allepu Radhamma W/o, Ilaiah, Age: 40, R/o, Venkatapur Mandal.	—	—	—	—	—	—	—	—	–do–	Crop Loss since last 3 yrs.

Source: *Office of teh Joint Director of Agriculture, Warangal*

List of Farmer Suicides reported from Andhra Pradesh.

Sl.No.	*Farmer's Name*	*Village*	*Mandal*	*District*
1	Dubashi Rajayya	Narsimpalli	Doultabad	Medak
2	Chikkali Ramulu	Tumkimetla	Bomraspet	Mahaboob Nagar
3	Kommala Mallayya	Paddapuram	Atmakum	Warangal
4	V. Narasimga Rao	Papayya Palli	Bajjanki	Karimnagar
5	Jangu Ravi	Venkatapur	Parakala	Warangal
6	Narasimha Reddi	Gorlaveedu	Bhupalapalli	Warangal
7	Harmandlu	Modnooru	-	Nijamabad
8	Natutta Ravi	Kamaram	Atmakur	Warangal
9	Malkalla Ramreddi	Kammarvalli	Chennurce	Adilabad
10	Lakkarru Mogili	Kamaram	Atmakur	Warangal
11	Syamala Mallayya	Nargaram	Parakala	Warangal
12	Kallepalli Mallayya	Kesavapur	Venkatapur	Warangal
13	Srinivasulu	Dharmavaram	Tekmal	Medak
14	Chavarthi Veeraswami	Chintapalli	Samgem	Warangal
15	Katta Papi Reddi	Yacharam	Anumula	Nelgonda
16	Yara Sudhakar Raddi	Eessipet	Mogullavalla	Warangal
17	Kakamonu Veerayya	Visadala	Medi Konduru	Guntoor
18	Dasari Acunjayya	Goodem	Raghunadhapalli	Warangal
19	Ramelvar Gulab	Shampabad	Bela	Adilabad
20	G. Rajemdar	Usenpalli	Atmakur	Warangal
21	Nageri Kishan Rao	Eela Kurthi Haveli	Geesukondo	Warangal
22	Lurdu Raju	Khammam Goodom	Buvanagiri	Nelgonda
23	Bandi Kalavathi	Venkatapur	Jafargood	Warangal
24	Khadavat Mangya	Nandya Nayak	Tanda Geesugonda	Warangal
25	Manupalli Sarayya	Mangapet	Mangapet	Warangal
26	Arula Jaganayya	Malliudurla	Dharmasagar	Warangal
27	Gangaram Balayya	Peddapuram	Marpalli	Rangareddi
28	Eejagiri Ramabadra	Papayya Palli	Venkatapur	Warangal
29	Dasandla Bhumalingam	Chilva Codooru	Gollavalli	Karimnagar
30	Canugula Sambayya	Serabayyapalli	Duggondi	Warangal
31	Vyasa Srinu	Tanikella	Lpmogarla	Khammam
32	Gandra Biksapati	Pegada Palli	Hasanvarthi	Warangal
33	K.Sanjeevayya	Alirajpet	Jagadevpur	Medak
34	Banotuswami	Bollapalli	Gooduru	Guntoor
35	Galivelu Subba Rao	Peda Nandipadu	-	Guntoor
36	Dasari Pedda Chennayya	Veepanagandla	Medatooru	Karnool
37	Nerati Mallayya	Biranpalli	Madduru	Warangal
38	Pendli Aanjayya	Dharma Rao Pet	Khanapur	Warangal
39	Khallipalli Ashok	Peddapalli	Peddapalli	Kherimnagar
40	Ajmeera Surya	Narayan Tanda	Duggondi	Warangal
41	Pandari Sarayya	Mangapeta	Mangapeta	Warangal

42	Eedula Kanti Narasimha Reddi	Pochannapeta	Buchannapeta	Warangal
43	Kanakayya	Gummadidala	Jinnaram	Medak
44	Damodar Reddi	Ummentyala	Kodurgu	Mehaboobnagar
45	Golkonda Eellayya	Kogil Vayee	Atmakoor	Warangal
46	Allepu Radamma	Narsapur	Venkatapur	Warangal
47	Kumar	Veleeru	Vargal	Medak
48	Darga Aanjayya	Manikyamma Goodou	Maheswaram	Ranga Reddi
49	Jagiri Komarayya	Ninaala	Nellikuduru	Warangal
50	Piditalli Rajamallu	Dharmaram	Jammikunta	Kharimnagar
51	M.Ella Reddi	Veldada	Tanarmeta	Warangal
52	Gollavaggu Satteyya	Gundlapalli	Sivampeta	Medak
53	Gollavoggu Pramcela	Gundlapalli	Sivampeta	Medak
54	Vinaala Sambayya	Kesavapuram	Duggondi	Warangal
55	Madduri Hanimi Reddi	Aakunooru	Sidhapur	Karimnagar
56	Viswanadhan	Balugoppa	Kalyanadurgam	Buantapuram
57	Tirumala Reddi	Panderlapulli	Moddikara	Karnool
58	Nammi Reddi Srinivasa Reddi	Vernula Palli	Vemulapalli	Nelgonda
59	Machcha Chandramouli	Kamalapur	Kamalapur	Karimnagar
60	Mutyala Lakshmi	Kamalapur	Kamalapur	Karimnagar
61	Anand	Sitarampuram	Devaruppala	Warangal
62	Yausafmia	Aaliyabad	Kondapur	Medak
63	Buchayya	Pegadapalli	Hasanparthi	Warangal
64	Mediboina Ramulu	Chinnayagoodem	Devrapalli	West Godavri
65	Eemmani Balanjineyulu	Tekula Kurpa	Koonavaram	Khammam
66	Banootu Bitya	Sitampeta	Gaarda	Khammam
67	G. Krishnayya	Yeskoru	Yeskoru	Khammam
68	Tenali Nagulu	Marsukunta	Yeskoru	Khammam
69	Hillikonda Jagannadham	Siroolu	Kuravi	Warang Nagar
70	Venkata Reddi	Gummadidala	Jinnaram	Medak
71	Venkata Reddi	Lingampalli	Peddapura	Nelgonda
72	Dharmasotu Lakshmi	Jagannadapuram	Palvamcha	Khammam
73	Katla Komrayya	Narsingapur	Tadvayee	Warangal
74	Gousu	Teegul	Jagadevpur	Medak
75	Vemula Aayelayya	Bhupatipur	Peddapalli	Karimnagar
76	Battula Narasimhulu	Ganda Boyianapalli	Vayeelpaadu	Chitturu
77		Kumbamvaripalli		
78	Chinna Venkata Danayya	Chandragoodem	Milavaram	Krishna
79		Borragoodem		
80	Bhukya Sankar	Eeeryatanda	Chennaraopet	Warangal
81	Gaogu Ayyellayya	Gaorremkunta	Geesukondta	Warangal
82	Chinta Vijay	Vangavahad	Hasanaparthi	Warangal
83	Mamidi Lachavva	Rechapalli	Sarangaapur	Karimnagar
84	Vuyyuru Krishna Reddi	Vuppalachalaka	Penuballi	Khammam
85	Masetli Bhumanna	Yaaval	Aodilabad	Aodilabad
86	Somayya	Jamikunta	Mogullapalli	Warangal

87	Katkuri Kanakamallu	Gurrekunta	Geesukunta	Warangal
88	Pantulu	Papayyapeta	Chennaraopeta	Warangal
89	Aalasyam Venkateswaralu	Polisettigundam	Khammam Rural	Warangal
90	Negarakanti yellayya	Manasapalli	Yetoorunagaram	Warangal
91	Tuppata Mallayya	Timmapur	Jagadevpur	Medak
92	Kavarla Ramesh	Begampeta	Mirdoddi	Medak
93	Bonaala Saramma	Gurrampalli	Peddapalli	Karimnagar
94	Kalipeni Venkatayya	Srirampur	Srirampur	Karimnagar
95	Dhannasam Hanmayya	Mudgulchittempalli	Vikarabad	Rabgareddi
96	Bollineedi Siddarao	Rimmanagooda	Gajveel	Medak
97	Chaliti Nammireddi	Nagaram	Bhupalapalli	Warangal
98	Aasuaka Narsooji	Kadivendi	Devaruppala	Warangal
99	Eengoli Chinaramulu	Nandigama	Nallabelli	Warangal
100	Balabi Badrayya	Bagrolipeta	Regonda	Warangal
101	Samini Lakshmi	Ramanjapuram	Venkatapuram	Warangal
102	Lakshmamma	Tanduru	Tanduru	Khammam
103	Devara Srisilam	Pedda Madooru	Devaruppala	Warangal
104	P.Janga Reddi	Ganggalapalli	Nagarkarnool	Mehaboobnagar
105	Pittala Sankar	Jayagiri	Hasanparthi	Warangal
106	Choudarapu Yellayya	Mahmadapuram	Duggondi	Warangal

Source: *Vartha Newspaper*

Details of Farmers who committed Suicide during November-December 98 in Warangal District.

S.N.	*Name of Farmer*	*Age*	*Village*	*Mandal*	*Date of committing Suicide*
1	Ketapalli Sambi Reddy	40	Ogalpur	Atmakur	22.10.98
2	Bhukya Sarma	35	Harischandra Nayak Tandra	Hasanparti	08.11.98
3	Kari Kumari Lingayya	49	Gidde Muttaram	Chityala	11.11.98
4	Malotu Danja	40	Mangalvaripeta	Khanapuram	12.11.98
5	Nagelli Tirupati Reddy	26	Challlagarige	Chityala	14.11.98
6	Indla Ayilayya	36	Neredupalli	Bhupalapalli	18.11.98
7	Pacchi Kalaya Someswara Rao	48	Aakinepalli	Mangapeta	19.11.98
8	Kattula Yakayya	32	Samudrala	Stn Ghanpur	19.11.98
9	Akutota Venkatayya	65	Govindapuram	Sayampeta	21.11.98
10	Bolla Hari Krishna	22	Nadikuda	Parakala	24.11.98
11	Edelli Lakshmi	45	Rauvlapalli	Regonda	18.11.98
12	Cheviti Veeranna	28	Tehsildar Banjar	Dornakal	03.12.98
13	Pentla Odelu	42	Nagurlapelli	Regonda	16.12.98
14	Ragula Devender Reddy	25	Jubilee Nagar	Regonda	16.12.98
15	Tallapalli Lakshmayya	38	Solipuram	Narmetta	18.12.98

Source: *Prajasakhti Newspaper.*

Details of Farmers who have committed suicide during 1999 – 2000 in Andhra Pradesh

S No	*Name of Farmer*	*Age*	*Village*	*Mandal*	*District*
1.	Bhubanagiri John Reddy	40	Gannavaram	Yedanpudi	Prakasham District
2.	Ravipati Koteswar Rao	37	Poluru	Yedanpudi	Prakasham District
3.	Gogati Bali Reddy		Kuntalapalli	Nallamada	Ananthapur District
4.	Kalmula Ramayya	60	Macharam	Amrabad	
5.	Pallepu Ankamma	45	Paladugu	Medikonduru	
6.	Kethavathrathan	30	Inumulanarva	Kotthur	Mehboobnagar District
7.	Yadayya	28	Rajapuram	Balanagar	Mehboobnagar District
8.	Boya Pengayya		Gangapuram	Zedcherla	Mehboobnagar District

Source: *Rathu vani various issues.*

Details of Farmers who have committed suicide during 1997-99 in Yavatmal District of Maharastra

S.N.	*Farmer Name*	*Taluka*	*Age*	*Suicide Date*
1	N A Thakare	Darwa	45	27/3/98
2	M N Kinhekar	Kalawati	50	25/3/98
3	Z L Khandare	Umarkheda	55	26/4/98
4	B G Sainkar	Tanaregari	40	11/3/99
5	R C Ambarwal	Kelapur	35	21/1/98
6	P V Kanhake	Kalamli	24	26/4/98
7	M R Bahade	Rui	55	26/12/97
8	D A Bhoyaz	Kalamli	35	11/5/98
9	K P Bhise	Kalamli	59	21/2/98
10	M B Navarange	Darwa	40	19/5/98
11	G N Pawar	Yerad	29	30/5/98
12	S P Rathod			3/6/98
13	M D Samratwar	Kelapur	28	7/6/98
14	G T Dhote	Balihulgam	60	13/3/98
15	R K Rathod	Nes	55	5/5/98
16	P N Patil	Arni	43	22/4/98
17	N N Deotale	Zari Jamani	62	2/10/97
18	V R Kharmade	Zari Jamani	52	27/11/97
19	L B Chavan	Yavatmal	65	19/3/98
20	A P Matre	Durwha	50	3/5/98
21	V K Kathane	Balehutgoan	26	17/5/98
22	M D Waghmare	Kalamli	28	9/5/98
23	N V Zade	Maregoan	58	18/6/98
24	S B Yeotikar	Kalamli		12/9/98
25	H L Patil	Balehutgoan		5/7/98
26	N N Charak	Arni	48	20/6/98

27	N M Lokhande	Arni	55	8/8/98
28	R A Rathod	Yawali	23	5/3/98
29	J N Parande	Digwar	45	10/6/98
30	R T Chandhari	Ralegoan	35	25/6/98
31	A L Karnade	Yavatmal	44	2/7/98
32	Z G Atram	Maregoan	35	26/1/98
33	P D Mokhadkar	Kelapur	55	29/10/98
34	M R Tichkula	Darwa	30	11/10/98
35	S A Talware	Kelapur	28	27/10/98
36	S B Wankhede	Mahagam	40	1/11/98
37	B L Khandare	Kelapur	35	2/11/98
38	N K Gamamde	Kelapur	45	7/11/98
39	A K Kachore	Kalamli	40	22/11/98
40	M R Detale	Pandhar	40	7/11/98
41	D C Pambhare	Ralegoan	25	15/11/98
42	R N Hamid	Kelapur	25	15/12/98
43	I K Agrikar	Ghatana	45	16/12/98
44	R B Tajane	Wani	45	6/12/98
45	R C Gughane	Darwa	50	28/12/98
46	S N Kumare	Zari Jamani	75	20/12/98
47	Z D Wichu	Zari Jamani	40	2/1/99
48	A T Gurnale	Zari Jamani	35	29/12/98
49	M K Jadhao	Darwa	45	10/1/98
50	S B Rathod	Yavatmal	52	22/12/98
51	C T Game	Ralegoan	22	14/1/99
52	S P Dhagadi	Zari Jamani		16/1/99
53	L R Potkamtmar	Kelapur	50	23/1/99
54	B T Netam	Zari Jamani	45	19/2/99
55	S L Addimar	Kelapur	38	29/1/99
56	M N Deokate	Nandura	45	23/2/99
57	T G Karnewar	Umarkheda	37	20/2/99

Source: *Vidharbha Organic Farmers Association, Yavatmal.*

CHAPTER V

Bija Panchayat

The Farmers' Verdict

Responding to the deepening crisis of seed and agriculture, the Research Foundation for Science, Technology & Ecology (RFSTE) and Navdanya, the National Biodiversity Conservation Movement, took the initiative to organize a *Bija Yatra* or Series of Seed Events in India during September- October 2000. The *Bija Yatra* covered issues related to Seed Rights, Seed Conservation and Sustainable Agriculture.

The events addressed the current problems that are faced by the farmers in India and abroad, including their rights to seed, and strengthening farmers' alternatives. The events were organised in collaboration with the International Forum on Agriculture and various national and international farmers' groups and organisations.

1. Bija Panchayat

Bija Panchayat, which was held on 24th and 25th September 2000 at Bangalore, was timed to precede *Asian Seed 2000*, which was to be hosted by the Asia and Pacific Seed Association (APSA) in collaboration with the Seed Association of India and the Association of Seed Industry. Primarily comprising of private seed corporations, the APSA's main agenda is to facilitate business development and seed trading in the region. The CEOs of international seed companies were expected to participate in this meeting.

Increasingly farming communities are losing their family members, driven to death by either increased cost of seeds, increased debts and crop failures. There have been several cases, in which farmers had to sell their land and even their kidneys to pay off their loans, or their houses or tractors have been mortgaged to the loan providers and often subsequently they have been arrested in case of failure to pay back the loans. There are also cases of contract farming in which farmers' seeds/ produce were rejected or not lifted, leading the farmers to commit suicide.

> 78% of our farmers own less than 2 hectares of land. 48% farmers are below the poverty line. They are incapable of resisting the multinational corporations as individuals. Only the unity of farmers 'organisations, agricultural workers' organisations, concerned scientists and citizens working together can preserve the lives and jobs of some 89 –90% of people in the country.
>
> **- Suneet Chopra,**
> All India Agricultural Workers Union

In India most of the cases of seed failures are being reported from these "truthful" seeds of commercial crops e.g. cotton. Today there are few examples in which farmers have taken the companies to the court

and have received compensation in case of failures of their seeds. The liberalisation, privatisation and globalisation trends in agriculture have resulted in the creation of an unregulated seed industry. At the same time, existing rules and regulations have been either abandoned or modified to accommodate multinational and transnational corporations. This "corporate control over the seeds" becomes complete with the introduction of transgenic crops. The farmers' seed supply and direct exchange networks have been adversely affected with the proliferation of unregulated seed market.

Son of a Andhra farmer giving testimoney on his father's suicide because of crop failure

The biotechnological innovations in the Indian context rely heavily on the technologies and investments of the First World. Development in these areas proceed either through transnational companies setting up their branches or through marriage of convenience between western biotechnology firms and national seed companies. In the latter case, the transnational usually operates by retaining the name of the national seed company to retain the loyalties of the farmers.

The introduction of genetically engineered seeds linked with the introduction of Intellectual Property Rights threatens farmers' livelihood and the national food security. IPRs in agriculture have been introduced as part of the implementation of the TRIPs Agreement through the proposed Plant Variety Protection Act. These IPRs threaten the inalienable right of farmers to choose what they grow, and to save, exchange and improve seed, and force them to buy seed every season or pay royalties.

The threat from IPRs is also posed through the phenomena of "biopiracy", wherein western corporations claim indigenous biodiversity and farmers innovation as their "invention". Examples of such erosion of the rights of Indian farmers include patents on Neem, Turmeric and Basmati. Even the Biodiversity Act, to be legislated under the obligation of the Convention on Biological Diversity fails to stop this phenomenon but rather encourages biopiracy of agricultural wealth by excluding it from the purview of the proposed Act.

The **Bija Panchayat** sought to articulate the people's voice so that the whole discussion and policy on the seed is not determined by the corporate sector and interests driven by profit motives. It provided an opportunity to collect evidences of seed failures, farmers' suicides cases, cases of lack of compensation to farmers by companies and public sectors in event of seed

failures, evidences on trials of genetically engineered crops as well as the monopolistic controls of seeds by companies. The first of its kind in India, the Tribunal was designed as farmers' hearing. Farmers through the Panchayat - an ancient Indian system of dispute settlement and governance – gave evidence and passed their verdict.

2. Seeds of Distress and Seeds of Suicide

The testimonies of farmers and their kith and kin from Andhra Pradesh, Punjab, Karnataka, Orissa, Bihar, West Bengal and Garhwal reflected the dimensions of the nation-wide seed and agricultural crisis. The evidence showed on the one hand the growth of corporate monopoly in the seed sector and on the other hand farmers' increasing dependency on these monopolies, which leads them to choose death as the only possible way out.

That the independent farmer is struggling to survive against immeasurably difficult odds is borne out by the number of suicides by farmers: over 2000 known deaths have occurred in Punjab, Andhra Pradesh, Karnataka, Maharashtra and Madhya Pradesh alone. Alaka Karar of West Bengal testified that in Manasavi village alone, 19 young farmers had committed suicide.

Prof. K. Gopal Iyer, Dept. of Sociology at the Punjab University (Chandigarh), in a comparative study of such suicides in Punjab, Andhra Pradesh and Karnataka, highlights the factors that contribute to such deaths:

- cumulative crop loss;
- cumulative debt;
- supply and use of spurious seeds and pesticides;
- seeds not tested enough before distribution;
- increase in the number of dependents in a family; and
- private money-lending agencies which charge a high rate of interest.

The Myth of Corporate Efficiency

Liberalisation of agriculture is being justified today on grounds of efficiency. It is presumed that corporate agriculture is a product of efficiency and intelligence. And thus corporate monopolies take control over agriculture and agricultural decisions. The farmer today is becoming just one factor in a giant food production, manufacturing and delivery system called agribusiness. This includes owning and cultivating the land, financing agriculture, controlling inputs like seeds, fertilisers, and pesticides, transportation of commodities from farm to market, wholesaling, agroprocessing and packaging, and, of course, trade in commodities both nationally and internationally.

Corporations presumably increase their efficiency through growth. Such growth occurs both through horizontal and vertical concentration: Monsanto, an agrichemical giant, merges with leading seed

Uday Dey from Balasore District in Orissa procured Proagro 6201 variety of paddy at the rate of Rs 120 per bag. He cultivated the paddy as per the instruction booklet that was supplied by the Hybrid Rice International, Hyderabad. Flowering was highly disturbed. The assured yield of 35-40 quintals was not achieved. Only 8 quintals could be obtained. He was informed by the agricultural officer that the paddy failed because of climatic conditions. Consequently he was not able to repay his loan which he has taken from the State Bank of India.

corporations, and Cargill, the giant trader in agricultural commodities, institutes contract farming, gets into agroprocessing on one hand and seed business on the other. In this form of concentration, there is no place for the small and marginal but independent farmer.

> The role of panchayats should bring to the notice of state the problems - land reforms, bonded labor policy, concealed tenancy. The immediate relief that can be given to farmers is conversion of his short term loan to medium term loans so that he is not a defaulter. Agro meteorology should be used to provide information on the climatic conditions. Absence of local market and storage facilities needs to be corrected. Compensation is flawed and it does not rehabilitate the farmer.
>
> ***Prof. M.K. Ramesh,***
> *National Law School of India University*

Profiting Through Disaster : "Truthful" Seeds or Killer Seeds?

The seed, which is the cornerstone of agriculture, becomes the best place to start generating profits. The leading cause of farmers' suicides is debt linked to crop failure due to the spread of exotic monocultures and "truthful hybrids seeds".

Before a company can launch certified seeds, it has to spend at least six to seven years of conducting trials and verifications under the supervision of regulatory authorities. In order to avoid such delays in the launch of seeds in market, seed companies sell the seeds as *truthful* seeds, which means that the company sells seed taking the farmers into 'confidence'. There is no regulation to prevent marketing of *truthful* seeds. In actual practice, however, rarely are the seeds *truthfully* sold to the farmers, as the testimonies of farmers bear out.

For example in Warangal in Andhra Pradesh, commercial crops have been grown since mid 1980s but because of major losses incurred in agriculture the farmers are desperate now and turn to anyone for inputs, promising them high yields.

Thus, though there was total crop failure of cotton in the district in 1997-98, leading to hundreds of suicides among farmers, the acreage under cotton increased in 1998-99. Aurangabad-based seed producers came with a variety of cotton and all the farmers took that variety. The plant in vegetative phase has been robust but with no flowering. Several farmers complained of it and brought to the notice of government, which constituted a commission to look into the crop failure. Many farmers were left out of the enquiry, and the commission felt there was no adequate proof of seed failure. The farmers, who were given with no compensation, were lured into planting Excel 35 variety of cotton this year in the hope of high yields. 36,000

Punjab farmer giving testimoney on his brother's suicide due to debt.

acres have been planted with this variety, which has been found to perform.

In Bidar and Gulbarga in the Northern Karnataka, Mahyco (a Monsanto subsidiary) sold around Rs 1 crores worth of seeds of Bajra in 7 days which failed. Farmers approached the agricultural officers and demanded action in the case. The officer informed that they are helpless and only thing they can do was to cancel the license of the dealer. Farmers lost all the inputs which used for cultivating the spurious seeds.

Andhra Farmers who sold their kidney to pay off their debt, showing the cut mark during the Bija Panchayat

Seeds, Chemicals and Finance: Unholy Nexus

Farmers testified to the fact that the dealers of seeds also supply the pesticides and fertilisers (often spurious). They are the extension agencies who advise the farmer as to what to spray and what not to. In addition they also handle the credit facilities and give loans at a very high rate of interest (36% in parts of Andhra Pradesh), thus pushing the farmer into deep debt.

Increasingly, multinational corporations that are in both the seed and the chemical business are directly marketing their products. For example, Monsanto has taken its *Roundup Ready* and *Machete* weedicides deep into villages. According to Uday Bir Singh of Chaprauli in Uttar Pradesh, the company has started to fund schooling of children from selected villages in order to win the farmers over to its products. Similarly Cargill Seeds (which has now tied up with Monsanto) also has a scholarship programme for school children in selected villages in Karnataka.

The nexus between the government and the industry becomes evident when the farmers approach government agencies and for help. In almost all the cases, the government officials blame the climate rather than the seed. Sometimes, the officials go to ludicrous limits to exonerate the corporations. In Andhra Pradesh, a government study on farmers' suicides found the cause to be illicit relations or consumption of liquor or family problems. The suicides were thus said to have been the result of social failure rather than crop failure.

The National Farming Farm Coalition also have to facilitate a class action law suit against Monsanto asking the court to give the plaintiffs triple damages for violation of US Trust law to award punitive and compensatory damages and seeking an injunction to prohibit Monsanto allegedly and taken punitive behavior. We also seeks to require testing of GE seeds and crops and we asked these tests to be subject of independent scientific review and the results of these test made public. The trial will be taking place next year and our lawyers are every hope of success.

Ms. Dena Hoff, *Chair of Northern Plains Resource Council, USA*

"Farmers are not Criminals"

Most of the farmers who committed suicide or sold their kidneys belonged to the lower socio-economic strata. They often worked on leased land. Even the grant the government gave to the survivors of the farmers' who committed suicide has now been stopped as the government claims that such grants have become the reason for farmers to kill themselves.

Punjab farmers growing cotton and paddy have suffered a loss of 1000 crore but the government has

not done anything as yet. In Karnataka out of 200 crore loss some money was given to the farmers, though a very meager amount of Rs. 4 crores from state funds. The A.P. government gave a compensation of 1 lakh rupees to the suicide families in the year 1997-98 but soon it was discontinued.

With the backing out of the government from agriculture, farmers have had to turn to private money lenders to finance their survival. 90% of the farmers take loans from private money-lending agencies that charge a very high interest rate. The problem is compounded, particularly in Punjab, by the withdrawal of government agencies like the Food Corporation of India from procurement. In the second half of the year, paddy prices fell drastically on the open market, and farmers had to resort to distress sales of farm machinery, strikes and agitation before the government stepped in to enforce the Minimum Support Price. Prof. Iyer asserted 'There are white collar criminals and elite criminals; farmers are not criminals. Farmers commit suicide in order to preserve their self-respect, which they are in danger of losing when harassed by money lenders.'

3. IPRs : Legal Control of the Seed

Seed is one agricultural input that has traditionally been in the hands of the farmer. Farmers save, exchange and sell seeds to one another. Till a few years ago, over 70% of the seed supply in India was farmer-to-farmer based. If agriculture has to be controlled, the seed itself has to be controlled both structurally and legally.

Mr. Percy Schmeiser is a farmer from western Canada who had been sued by Monsanto for his allegedly using Genetically Modified rape seeds. Mr. Schmeiser grew rape seeds for the past 50 years and had maintained his own seed bank. Monsanto did a aggressive campaigning claiming that the genetically engineered rape seed provided by them was more nutritious, had high yield and would consume less chemicals. But this was not entirely true. His neighbor sowed genetically engineered rape seed, which resulted in contamination of his indigenously grown seeds. Monsanto sued Mr. Schmeiser for having 'illegally' acquired Monsanto's patented seeds after having illegally entered his field and examined the plants. In the pre-trials although Monsanto admitted that they had no evidence of Percy illegally acquiring them. Mr. Schmeiser counter-sued Monsanto for polluting his fields and the environment with an uncontrollable technology.

Percy Schmeiser, Canadian farmer, giving evidence in Bija Panchayat

Percy Schmeiser is one among the thousand farmers who have been sued by Monsanto for 'stealing' the company's seeds. The evidence of Percy Schmeiser

I come from Peru from the Andes, the land of potato. My people have domesticated corn, potatoes, beans and so many other crops. All the richness that my people have created in the Andes has been attacked by big corporations who want to make them slaves. Since colonial times my people have resisted all their (MNCs) different attempts to take away our seeds. We have our own heroes, from Patamaru, to Nikhaila Basterus, to so many other people that rose against the Spanish, because they forbade us to use our seeds and to eat our food.

Today, the spirit of resistance against the colonisation of seed is still strong. Throughout the Andes, from Venezuela down to Chile, the communities have joined together to establish a food security corridor. This means linking different micro centres of origin and crop diversity to traditional agriculture corridors. And we want all these area to be genetically modified free and patent free zone.

Also we are establishing our biodiversity parks because we think as a civilization we have to have all the diversity we have created. The parks are means of controlling our lands and controlling our resources. These parks will be free of patent and free of GMO's.

- Mr. Alejandro, *Indigenous People Biodiversity Network, Peru*

shows that patent and Intellectual Property Rights being forced through WTO/ Trips inevitably turns farming into a *police state*. The new Patent laws, Plant Varieties laws and Biodiversity Act introduced in India therefore have serious consequences for the Indian farmer already burdened with high cost corporate control seed supply.

Intellectual Property on Seeds and Monopolisation of Life

The inherent right of the farmers to save and exchange seeds is under threat. The proposed Plant Variety Protection Act fails to protect the rights of the small and marginal farmers. The Patents (Second) Amendment Act 1999 provides for patenting on life and promotes biopiracy of our indigenous knowledge and resources.

The Plant Variety Protection Act is being amended to allow corporate IPRs on farmers' varieties. The processes involved in challenging corporate IPR claims and/or claiming compensation/ royalty are not merely drowning in red tapism, they turn the farmer from being the custodian and steward of biodiversity and its knowledge into a supplicant for benefits to be given at the pleasure of the corporations. Further, the benefits, if any are given, will be given in the form of arrears of land reforms, which further distances the farming community from custodial stewardship of the biodiversity and its knowledge.

IPRs on biodiversity, as evidenced in Canada, the US and other countries where they are in place, increase the cost of seed for the farmers leading them deeper into debt. They also lead to the destruction of biodiversity, as the IPR claims of corporations are so broadbased that they cover the genetic material contained in the variety. For example, the RiceTec patent on a rice variety derived from two basmati varities from the Indian subcontinent claims protection for the genetic material that has gone into making the variety. The two parent lines have themselves been derived from many traditional as well as domestically derived varieties. Thus the patent claim in effect is a claim on all these varieties, and if enforced strictly, will prevent farmers from using these varieties on grounds of patent infringement. Lack of use over a period of time will destroy the vast agricultural biodiversity that exists still in many Third World countries including India.

Similarly the Biodiversity Act 2000 too fails to fulfill the obligations under the Convention on Biological Diversity (CBD) to protect the rights of the communities to use their biodiversity resources of the country. It operates at cross purposes with many of the biodiversity related laws that we have in India. There is absolutely nothing like developing cross linkages and synergies between various institution and laws that have evolved in relation to

biodiversity, like the Forest Act, the Forest Conservation Act, the Wildlife Protection Act and so many other legislation in relation to biodiversity in the country. The Act does not clearly define the roles of the various bodies that either exist, such as the Panchayat, or are especially created, such as the Authorities. The Gram Sabha, which is the custodian of the biodiversity according to the Constitution, has little role to play in taking decisions to protect it. There is also hardly any mention of biosafety in the Act, even though India is a signatory and a party to the Biosafety Protocol.

The main aim appears to be the documentation of biodiversity and knowledge related to it, to assist its exploitation for private use, as there is mechanism to maintain it in the public domain. For example, according to the Act, agricultural biodiversity is outside its purview and shall be governed by the PVPA, which allows IPRs on seeds and plant varieties. The Biodiversity Act is better as a Biopiracy Act, as it takes away the rights of our communities and indigenous healers to use biological resources for their livelihood and survival.

> We also have started selling food donated by our members at a farmers' market because we want people to know that there is abundance of good food, safe foods, right in their area. We are now organsing locally and nationally to prevent Senate Bill 1155 from becoming Law. This Bill would keep states from passing their own laws on their own food safety standards and they also can not institute any requirements for food labeling.
>
> ***Ms. Dena Hoff,*** *Chair of Northern Plains Resource Council, USA*

Such IPRs, in today's age of mergers and acquisitions, control who has access to seed, to knowledge about it and to the technology. This means that fewer and fewer companies are making critical decisions about the agricultural research agenda, and the future of agriculture worldwide.

The importance of IPRs to agri-chemical and agribusiness corporations revolves round the fundamental issue of control. Seed is the first link in the food chain. Whoever controls the seed controls the food supply. Therefore Monsanto spent over $8.5 billion acquiring seed and biotech companies, Dupont spent over $9.4 billion to acquire Pioneer Hi-Bred, the world's largest seed company and Dow Chemical bought Cargill Seeds North America in mid-September 2000. In spite of this, the control cannot be total as long as farmers can save, share, exchange and sell seeds among themselves. Today, the farmer-saved seed and state-run seed programmes are worth around $22 billion, which is almost equal to the $23 billion total commercial seed market worldwide.

It is expensive and rather inconvenient for companies like Monsanto to enforce their patents. Thus the Gene Giants are developing new mechanisms such as the genetic engineering technology to enforce their corporate monopolies. IPRs on seed become even more powerful when they are linked with powerful technologies like genetic engineering.

4. Genetic Engineering and Threats to Agriculture and Life

Genetic engineering technologies attempt to create seeds that cannot reproduce themselves, and thus biologically control the complete enslavement of agriculture.

The terminator technology which is not yet commercialised in India, has as its primary aim, the maximization of the seed industry's profits by destroying the ability of farmers to save their seeds and breed their own crops. Genetic seed sterilization goes far beyond intellectual property. A typical patent provides

Along with other organisations the National Family Farm Coalition is beginning a farmer-to-farmer campaign to inform farmers with regard to genetic engineered crops: Are genetic engineered crops cost effective and marketable? How do these crops perform in the field? What are the legal issues involved: liability, growers contract and insurance? What are the environmental impacts on soil, plants, insects, wildlife? What about gene contamination? What do GE crops do to farmers' independence? How do genetic engineered crops contribute to further corporate control? Are GE foods safe from the health point of view? At local level in Montana and six neighbouring states, we have begun a food safety campaigns. We call it "safe to harvest safe to eat". And we have a fact sheet that has been entitled "Think before you plant and think before you eat". And it gives very basic arguments to farmers and consumers why they should not be planting genetic engineered seeds, while they should not be eating genetically engineered foods and it gives them places to go for more information.

an exclusive legal monopoly for 20 years but Terminator is a monopoly with no expiration date. It is the perfect tool for the corporate seed industry in a global market - because it destroys the concept of national seed sovereignty.

Last year, Monsanto and AstraZeneca bowed to public pressure and made a public commitment not to commercialise Terminator seeds, leading people to believe that that the crisis has passed. However, both Monsanto and Astra-Zeneca have merged with other companies since they made their announcements. A RAFI study released earlier this year shows that there were seven new patents on Terminator Technology issued in 1999 alone and 2 of them are jointly held by USDA and its seed industry partner, Delta and Pine land, which is the world's largest cotton seed company. In the face of massive international public protest, the US government continues to defend and support Terminator. It is, quite literally, the public sector in service to the corporate oligopoly - yet another indication of how the State the world over has become subservient to corporate interests rather than that of the public.

Another GE technology that is potentially more dangerous than the terminator technology is the Genetic Trait Control Technology. With genetic trait control the goal is to turn a plant's genetic traits "on" or "off" with the application of an external chemical. In mid-September this year, researchers in the United States announced that they have succeeded in turning mouse genes on and off like the switch of the light bulb. When fully grown the mouse is fed an antibiotic to activate the gene's switch and to shut off the gene of interest. Then the gene can be activated again when the antibiotic is removed from the animal's diet. This research is in the very early stages but the implications are staggering because it means that someday the genetic traits of commercial livestock could be turned on and off by chemical feedings. Similarly, if companies can successfully engineer seeds to perform only with the application of a proprietary pesticide or fertiliser, for example, it will reinforce chemical dependencies in agriculture - and both farmers and food security will be held hostage to the gene giants. In 1999, at least 43 patents were issued relating to genetic trait control technology, and the patent owners include virtually all of the gene giants and their subsidiaries. Seeds like *Roundup Ready* and those with the Bt have already been commercialised, and are creating massive ecological and economic devastation.

Public Good vs. Private Profit

The battle for the control of seeds, of agriculture and of food has clearly pushed the concept of public good to beyond the background. Given the vast economic power of the corporate sector and the stagnant budgets for public research, not only latter has been totally marginalised, but the benefits of public sector research are being privatised through the patent regime.

Even more frightening is the control that corporations exercise over such research.

Dr. Pusztai, Fellow of Royal Society of Edinburg, is a scientist in the Rowett Research Institute in Aberdeen, has done pioneer work in the isolation and characterization of lectins. Lectins were supposed to be harmful, but it was discovered that they have natural insecticidal properties. This led to the potential of introducing lectin genes in food crops. Dr. Pusztai, researching the health impact on mice of food genetically engineered with the lectin, found that potatoes genetically engineered with lectin were not 'substantially equivalent' with non GE potatoes of the same parent line. This finding contradicted many earlier often repeated assertions.

Corporations claim patents on genetically engineered products on the grounds of predictability of the behaviour of the inserted gene. However, it was evident from Dr. Pusztai's research that the snowdrop gene was not behaving in a predictable manner, and that its behaviour could be affected by the crop into which it was engineered - ie., the new environment into which it was inserted.

Corporations deny any possible negative health impact of genetically engineered foods by claiming 'substantial euqivalence' - ie., the chemical and behavioural properties of genetically engineered food is in no way different from those of non-GE food. Thus they deny the need for any labelling information as to whether the food is produced from GE crops or not, or the need for segregation. Dr. Pusztai's research revealed that even when the parent lines are the same, the insertion of an alien gene has impact on both the chemical composition of the food. For example, the genetically engineered potatoes had significantly different levels of proteins and enzymes from the parent line potato. The research also revealed that consumption of such foods had significant impact on the reproductive, immune and digestive systems of mice, including causing structural changes in their physiology.

When Dr. Pusztai shared his concerns with viewers on a TV programme on 10th Aug, 1998 with the permission of his institute, Novartis (the company with the patent on the gene) together with the rest of the gene industry attacked his findings. The research institute for which he worked was pressured into gagging Dr. Pusztai and repudiating his study. It was only after the intervention by the British Parliament that he could publicise his findings and his concerns.

Concerns of the safety of genetically engineered foods has led to a Europe-wide consumer movement that has resulted in the virtual ban of GE foods in the continent. In the UK, in mid-September, a group of environmentalists from Greenpeace were acquitted of causing criminal damage to the GM crops, which they had ripped up and torn from the ground during field trials. The environmentalists argued that they wanted to prevent GE crops from pollinating and therefore polluting the farms that were nearby and in the neighbouring farmers' fields. They claimed to have learned protest tactics from Indian from Mahatma Gandhi and his followers.

The conflicts and debate over the safety of genetically engineered food and crops highlights the inability of genetic engineering to feed the world.

Firstly, as corporate profit rather than people's hunger and nutritional needs is the driving concern, genetic engineering is geared towards increasing these profits. Bovine Growth Hormone, for instance, is directed towards increas-

Since several years we are fighting in France and in Europe against the industrial agriculture. Last year we win two very big battles. The first battle, begun in 1977, was against GMO's. Novartis and Monsanto wanted to sell their GMO's and wanted to impose their GM corn and soya on us. We fought this battle very strongly since 1997. We have to made non-violent direct action to achieve this success, to inform the population and to say also these big corporation that we don't want them. In January 1998 Novartis was doing trial of its seeds to ultimately sell these but we made an action and about 200 farmers carried their own seeds and we opened the bags of GM seeds and mixed our seeds with them. So Novartis could not use any more its own seeds. That was a very good action.

At the same time we are also having a big battle against the WTO. It is unacceptable that the WTO will decide what we should eat. That's why in August 1999 we protested against the (WTO) decision (against Europe who did not want to import US beef for health/taste reasons) and the tax put on European products in United States. In protests we also dismantled the Macdonald's which was in construction.

It is very important farmers from Europe, from India, from United States and Africa and South America fight together against the corporations.

- José Bowé, *Founder of the Confederation of Paysanne (CP) in France and himself a farmer from Larzac region of Languedoc*

ing the production of milk and other dairy products. However, this increased production will be available to those who need it only at a very high price as both the technology and the product is controlled by the patent holding corporation. Similarly, genetic engineering is being used to develop crops resistant to branded pesticides and herbicides of the corporations.

Secondly, as has been shown above, the health impact of consuming such products over a period of time is not known. Very little research, either public or private, has been done on the health impact of genetically engineered foods, and whether such foods can really meet the nutritional needs of the people. The potential for unpredictable behaviour and gene expression, the potential for trans-species migration of marker genes carrying antibiotic resistance, and the increased use of chemicals in the cultivation of genetically engineered crops raises serious implications for public health.

Consumer demand for labelling of genetically engineered foods becomes even more complicated as the food miles between the producer and the consumer increase. As the distance food has to travel increases, the process involved increase, and the middleman - the corporation in this case, becomes more anonymous and elusive. When food is imported from other countries where there are no special labelling laws in force, identifying foods as genetically engineered can become almost impossible.

For example, the large scale planting of GM foods so far have taken place mainly outside the Europe, in countries such as US and Canada, Argentina and Australia, where they have been approved for commercial growth and sale. These crops are then sold to enter on to the international food market, where grain merchants like ADM and Cargill, buy up the grain, ship it and distribute it through out the world. Much of these grains then enter into processed foods; often the same corporations are the processors, who also own the lesser ingredients like thickening agents and emulsifying agents, which again may be produced by genetic engineering.

Globalisation, if it has to become truly people-oriented, has to make universal laws that protect people's health from corporations, rather than making universal laws that protect corporate profits and control at the cost of people's health and livelihood.

A third conflict is the North-South dimension. The Northern countries are set to explore Southern countries for genetic resources. Several countries rich in biodiversity have been exploited by the Northern corporations. However, governments the world over, including Southern governments are not opposing this as they are viewing the technology as the force that can drive their

economies forward and give them the cutting edge in the competitive world market. This mindset seems to ignore the fact that neither is the technology controlled by governments, nor the market in which they need to be competitive. Both of these are controlled by the corporations.

Fourthly, the debate on genetic engineering raises questions related to the role of science for public good. One industry representative recently wrote that, in the age of biotechnology and intellectual property "the time honored and noble concept of international public goods is essentially obsolete." Dr. Pusztai's experience clearly shows that when governance does not honour its commitment to the people, public interest suffers. Decisions that should be made in the public institutions for promoting public good are made in corporate offices for promoting corporate interests.

India already has experienced such decision making and governance by the gene giants. When the first boll guard trail took place in 1998, the trials were secret, the planting had taken place before they got official government permission, in violation of every law. This year too in September the Government of Karnataka has given clearances for trials including for multiplication of seeds in a 150 hectares in spite of the fact that no multiplication of seed is allowed in field trials. Especially when testing the safety of a crop, law requires that every bit of the plant material is burnt. In spite of such violations, the science is considered 'strong science' as opposed to people's science, which is based on sustainability and leads to ecological and harmonious production systems.

Taking Up the Challenge

Consumers are a powerful force against market driven governance. Consumers first raised the health implications of chemicals in agriculture, and helped the rejuvenation of organic, non-GE, ecological agriculture.

Consumers of Europe have led the battle against genetically engineered foods, and their demand for non-GE foods has led to a decline in share price of GE companies; and this led them to question their biotechnology operations or to seek to separate them in financial terms.

The challenges to ensure sustainability and equity for all life on earth - plants, animals, people of the South and the North - calls for continued and concrete action against monopolistic forces. As Justice V.K. Krishna Iyer, put it at the conclusion of the Beej Panchayat.

> *This is not the end. This is the beginning. Our enemy is strong and they have a power to corrupt. Open your eyes and see what is happening in this country. Open your eyes and see what is happening in the world.*
>
> *The seriousness of the occasion must be understood. We are struggling for seed. What shall I say, if the seed itself is corrupted, if the seed itself is monopolised where is the hope for us? For us means for people of the earth. We are one billion strong. I speak here with the authority of one billion, not because of vote cast in the booths but because I represent the feelings of the common people. The nation shall never commit suicide.*

5. The Verdict of Bija Panchayat

The accounts given as evidence by the large number of relatives (widow, son, brother) of farmers who killed themselves and given directly by the farmers who sold an organ for money, all point to a common scenario. This in brief is cumulating debt owing to high cost and substandard seed and other inputs pushed by companies and their agents for their own profits. A number of big companies which are connected to a part of transnational companies (TNCs) as well as smaller companies are involved in the cases.

The World Bank Seed Act of 1988 opening up the seed sector to the MNC, control and domination of Private Industries and simultaneously withdrawal of government sector has played a major role in pushing farmers into debt, suicides and trade of body part.

Low interest, agricultural credit system have disappeared and farmers have been pushed to borrow at high interest rates from the same agents who also push seed and chemicals.

The MNCs have taken over the control over India's seed supply without any responsibility and liability. "Seed business has become a business of genocide, forcing the farmers to pay for the corporate profit with their very life." Govt. have totally failed to provide security and protection to vulnerable peasants.

The farmers were persuaded to go in for growing more high risk, alleged high yielding varieties of cotton, chillies etc. As institutional credit is either not adequately available or there is a ceiling on it they took large loans from private money lenders and input dealers, the former at 36 to 48 percent rates of interest, the latter against delivery contracts. It is clear that there is big influx in the villages of fly-by-night operators supplying substandard seeds, pesticides and fertilisers, who persuade the farmers to buy their expensive inputs on credit. Even in the case of genuine inputs the risk is borne entirely by the farmer while spurious inputs supply itself guarantees failure and further enmeshes the farmer in debt. The farmer tries to repay debt by selling land, selling even his body organ; but when cumulated debt exceeds all hope of repayment he is driven to suicide.

An organised racket appears to have developed to exploit the farmers distress to obtain organs for transplantation. Evidences were given mainly by the affected farmers from Andhra Pradesh, Karnataka and Punjab. The crisis has developed to this point, owing to the complete deregulation of the markets in credit and inputs and owing to the withdrawal of the state from its responsibilities in the course of the last decade. The crisis will affect larger areas of our agriculture unless immediate steps are taken to halt the process described. Government has a responsibility to intervene because it cannot shirk its duty of safeguarding the public interest.

The burden of high prices of the corporate seed combined with high unreliability and unaccountability will further increase with genetically engineered seeds.

Patent and IPR's regime as system of monopoly control will further aggravate the severe crisis the farmers are facing. The Trade Related Intellectual Property Rights (TRIPS) regime of the World Trade Organisation (W.T.O.) will therefore create conditions for a deepening of the economic crisis for the farming community in India.

6. Recommendations

1. The role of the multinationals in the seed production and distribution should be balanced with liabilities and responsibilities.
2. The public seed sector which is being dismantled needs to be reinvigorated through strengthening its research and development and farmers participation.
3. Seeds being distributed should be tested by Agricultural Universities for their agro-climatic suitability, germination characteristics and vulnerability to pests and diseases.
4. It should be the responsibilities of the State to provide adequate checks and balances to ensure healthy seeds and genuine agriculture inputs. Setting up of the regulatory bodies at the state and district levels which will permit only the supply of those inputs whose samples have been tested and whose distributors have been licenced. There must be penal provisions for supply of substandard inputs. Farmers seed supply should also be strengthened through programmes such as in-situ Conservation and Community Seed Banks.
5. The credit requirement for the under privileged farmers could be established with the support of the organisations that have participated in the Bija Panchayat by setting up a legal defense fund. This would be an important step towards helping farmers fight the giant and reckless multinationals.
6. Strict punishment should be awarded to persons who are involved in the trade, storage and distribution of spurious agri-chemicals.
7. A moratorium should be imposed for a period of ten years on the commercialisation of the genetic engineering in food and farming in India.
8. Traditional rights of the farmers to freely conserve, develop, use, share, exchange their seeds are fundamental rights which cannot be alienated by any IPR law. We must develop our indigenous "sui generis" system to protect farmers' seed sovereignty.
9. The Protection of Plant Varieties and Farmers Rights Act 1999, the Patents (second) Amendment Act 1999 and the Biological Diversity Act 2000 are harming farmers rights that should be changed.
10. In order to defend the rights of the small farmers and for the food security of people there should be a call for exclusion of seeds, life and life forms from the TRIPs / WTO.
11. There should be guarantee of minimum support price to the farmers for their agriculture produce.
12. In order to safeguard the interest of the farmers, the representative of the farmers should be adequately represented in the Commission on Agriculture on Commodities and Prices.
13. It should be the endeavor of all the organisations, the State and the Central Governments to support the farmers in achieving the self-sufficiency in food production.

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CHAPTER VI

Seeds of Life, Seeds of Freedom: Rebuilding Seed Sovereignty

The most important component in the agricultural sector is the seed. Seed is considered as the answer to the problems of making other agro-inputs productive and cost effective. In fact, seed is the most crucial, critical and vital input, which is well-recognised carrier of production technology.

About 70% of the India's population is engaged in agriculture. Due to increased pressure of population and lowering land fertility levels it is mandatory to increase the productivity of the area. To achieve this goal, availability of high quality seed in adequate quantity is of paramount importance.

Agriculture and civilization have progressed simultaneously along with seed husbandry and the history of the development of new crops and their varieties. Many people ended nomadic lives to settle permanently as they learnt to plant, harvest and preserve seeds of certain grasses over the season. The development of major human civilizations had their bases in the culture of three cereal staple grains: wheat, rice and maize. The Mesopotamians planted wheat along the banks of the rivers Tigris and Euphrates, the Chinese grew rice on the banks of the Hwang Ho and Yangtze, and the Mayans cultivated maize along the dry flat plains of the Yucatan.

Seeds of agricultural crops have been and will continue to be the major source of food worldwide. The large–seeded grasses or cereals belonging to the plant family Poaceae contribute more food than any other family, followed by Fabaceae, constituting legumes and pulses.

The present scenario demands for importance of strengthened network of seed production, supply and its delivery system. The government of India decided to reorganise and expand the seed industry following the recommendations of 1968 Seed Review Committee in the country, so as to create institutional framework for support and coordination of all the facets of production.

The Green Revolution did engender a form of food security; however, this form of food security, which was driven by centralised control over agriculture, its resources, its technology, credit and food distribution, was not based on ecological security and livelihood security. As governments and people wake up to the devastation caused by the Green Revolution and the centralised control system exemplified by it, corporate control over food production and distribution systems is being pushed as the means of ensuring food security.

Liberalisation has allowed the entry of multinational corporations into the sectors of food production and distribution. Seed companies like Monsanto and Novartis, through mergers, acquisitions and IPRs, are acquiring global rights to seed; the same seed companies are pushing new ecologically perilous GE technologies that could have an equally risky impact on human, animal and plant health. Global trading giants such as Cargill are taking over the food distribution systems of country after country, and placing the food security of the ordinary citizen on international markets.

The food security system, put in place during the Green Revolution, were centralised systems, like the Food Corporation of India (FCI), the Agriculture Price Commission of India and the Public Distribution System (PDS). The PDS during the green revolution was an instrument to subsidise the food that was being produced at high costs through green revolution technology to reach the consumers at lower price. This was a capital intensive subsidised and centralised system which failed in its attempt to serve the most neediest and starving people. This later led to its diminishing role and dismantled with the beginning of liberalisation and globalisation process in the country. The multinationals are seen as the viable alternative thus creating corporate monopolies, which were earlier state monopolies.

Nowadays the threat of GM seeds is looming over the Indian horizon. India's total imports of seeds in 1998-99 were 244 tonnes valued at $9.8 million. The total exports were 4,900 tonnes, worth $15.4 million, marginally up from 4,700 tonnes in 1997-98 worth $14.6 million tonnes (R. P.Singh et al, Research Paper CIMMYT).

The hijacking of the food system by the MNCs will lead to the complete control over seeds and fertilisers and would provide farmers with credit extension services and marketing support. This would be a sort of bonded farming, as the MNCs would later on dictate their terms and conditions, which would be market driven. Little concern in terms of the welfare of the farmers, the ecology of the area and natural resource management would be taken into account.

To subvert the attack on our food and livelihoods by the MNCs, it is very important to reinvigorate the public sector seed production, supply & distribution and at the same time help building community initiatives of seed conservation. These are the systems which need to be built which are being threatened by the entry of seed and agri corporate. The corporates are posing the threat through monopolisation of seed.

Many leading economists have cited that the private agencies though with their aggressive marketing are able to set aside the PSU, but the fact remains that these companies long-term viability remains uncertain. All seed companies owe a debt to the government-funded agencies that have provided them funds for research, extension and development services. The private seed industry is motivated by the quest for profits, the private seed companies and the MNCs aggressively pursue the most lucrative commercial markets; at the same time, they largely ignore marginal areas were there is real need of research and development.

Thus in this scenario it becomes very important to rebuild the farmers' seed security through building public sector seed research and control as exemplified

by the case of Tarai Seed Development Corporation and through farmer-based in-situ conservation and exchange of traditional varieties of seed by local communities as initiated by Navdanya.

1. Strengthening Public Sector Seed Supply: A Case Study of Tarai Seed Corporation

Cooperation has been a way of life with family norms and discipline as well as social morals and obligations in the Asian countries at large and India in particular. Such an ethos has flourished under decentralized agriculture economy. But now the industrialization of both the heavy industries and the agricultural scenario disrupted the joint family structure and the microfamily units emerged. The age-old traditions and value orientation has changed yield competition succumbing to the market driven economy. Developments and breaking of social fabric has seen the intrusion of multinationals and transnational to carve a niche by displaying themselves a part of the society. This has lead to disparities and gaps in the social relationships but also proving to be agents of instability and destruction.

Against this background, the proven experience of cooperative movement offers a ray of hope for an egalitarian order even under the modern circumstances. The major thrust of cooperatives in the post independence era has been towards the support of agricultural production through provision of agri credits, quality seeds machinery etc. and creating post harvesting facilities for the farming community

Towards this, a system aiming for involvement of farmers in a corporation was envisaged. The involvement of the farmers right from the farm fields (seed production and farming) to the board rooms (decision making process) would ensure that the policies formulated would aim to work for the farmers betterment. The cooperatives are needed very much for supporting basic research and research targeted at marginal production environments. It is the corporations that strive to formulate policy which are designed to meet the broader needs of potential end users and are able to strike a balance between the efficiency goals (best achieved by large scale farmers) and the equity goals (that are achieved by addressing the needs of small scale and marginal farmers).

The National Seed Corporation (NSC) was registered as a public Sector Company on 19th March 1963 under the companies Act, 1956. It was set up with the aim of making available to the farmers' seeds of superior crop-plant varieties/ hybrids developed through scientific methods and improved technology to achieve higher and stable yields. The NSC and the State Seeds Corporation over the years have been downsized by the entry of private and multinational companies for capturing the markets that were held by the SSC and prior to that by the NSC. This gradual takeover of the National and State facility by the private companies and MNC's will propagate the vested and selfish motives of these parties. This would further deteriorate the position of farmers, both the small and marginal.

Still in the present dismal scenario a seed corporation known as TARAI SEED CORPORATION comes as refreshing change were the priorities are set by the farmers within a Government set-up.

Tarai Seed Corporation

It was at this juncture that the Tarai Development Corporation (TDC) was established at Pantnagar, U.P. in 1969 with the assistance of the World Bank. Prior to this, the Seed Production Department of the G.B.Pant University of Agriculture and Technology was accomplishing the work of seed production. TDC was restructured in 1978 in order to expand its production activities to 55 districts of U.P., which were only 3 districts. The Corporation functioning since then under the name of Uttar Pradesh Seeds and Tarai Development Corporation (UPS & TDC), has enormously increased the infrastructure and diversified its production programme. Under the auspices of Tarai Development Corporation (TDC), land reforms work for the benefit of farmers viz. leveling grading, development of irrigation facilities; electrification, sinking of deep and shallow tube wells were carried out. Also import of agriculture implements such as tractors, combine harvesters in order to provide basic input to the shareholders/farmers (seed producers) for efficient and quality seed productions were carried out.

Objective

The TDC's emergence as a powerful seed certifying and seed distribution agency in the Tarai is well recognized. The Corporation's close working relationship with the farmers has allowed them to set objectives such as to achieve growth of 15% per annum on the average, a return of 12.5% after tax on Net Worth has been planned. The Corporation with the farmers participation aims to diversify its product mix based on the market intelligence, so as to produce an increasing quantum of high value added products, rising to 25% of the total turnover.

The corporation along with the Tarai farmers as their main seed producers is gearing up to maintain its name and quality standard in the region. The main marketing strategy includes treating the farmer as the focus of all activities. Its emphasis on the promotion, packaging and customer relations with the farmers by looking into their needs, by giving them technical as well as financial support especially during the sowing and harvesting time.

Further, the Corporation aims at strengthening the co-operation and tie-up with other players in the market. The aim is to involve the agricultural universities, the extension workers of the Agriculture Department/ Universities to spread the aims, objectives and the facilities extended to the farmers by the Corporation. A research and development cell is being set up with the responsibility for keeping liaison with various research organization and maintaining the data bank on the seed varieties that are being developed. Besides the cell will actively be involved in giving direction to diversification of production and marketing operations. The farmers have trust in the TDC as the TDC aims at achieving self-sustaining growth, primarily based on internally generated resources.

The Organisational and Capital Structure

The Corporation is an autonomous institution with the Principal Secretary/ Agriculture Production Commissioner of the State as the Chairman. The apex policymaking body in the organization is the Board of Directors having six

farmers and powers to decide over the policies and decisions matters. The farmers are also having stake in the Corporation. The farmers contribute to about 33% to the capital share.

Seed Production Activities and Farmers Involvement

To produce quality certified seeds as per the targets laid down in the "State Seed Plan", the TDC works with close co-ordination with the farmers. The TDC organizes annual meet with the farmers so as to inform them about the latest developments. In order to achieve utmost success in work plans a system has been evolved in which the TDC sends out requisition forms to farmers asking them about their capacity for production of the seeds for the production and supply of the Foundation and Breeder seeds of various crops/varieties. The Corporation then certifies the seeds obtained from the farmers. The Corporation subjects the seeds for certification to artificial drying, grading, upgrading, treating, rigorous quality control and packaging sizes to suit the farmers need. During the seed production the aim activities in which the Corporation and farmers work in close co-ordination are:

1. To organize the seed production programme at shareholders farm as well as at the farms of other progressive seed growers as per target fixed.
2. Arrangement for the foundation seed production and its distribution to the seed growers, inspection of the seed production fields to ensure genetic purity and disease free seeds. Assist seed producers in crop management and adoption of plant protection measures.
3. Installation, management and operations of seed processing plant. Proper storage of unprocessed as well as processed seeds.
4. To ensure the availability of foundation seed
5. Providing gunny bags free of cost to its seed growers, to ensure timely supply of pure seeds.
6. Providing all the other facilities to the seed growers, which are required from time to time for quality seed production.

Procedure Adopted

The Corporation handles only three categories of seeds; Breeder, Foundation and Certified seed. Breeder seed is produced by a Research Institute/Agricultural University under the direct supervision of concerned Plant Breeder and monitored by a team of experts duly constituted by Central Seed Committee. As per provisions of Seeds Act, Foundation Seed is the progeny of Breeder Seed and used for Certified Seed Production. Certified Seed is the progeny of Foundation seed and is used by the farmers for commercial crop production. Foundation Seed and Certified Seed need to meet the minimum Certification Standards specified under the Seeds Act.

The Corporation sends qualified staff to the field to assist the farmers about various precautions to be taken at field, as well as at plant level, for the quality production of above classes of seeds. Good quality foundation seed is given to the farmers (seed producers). The inspection by technical staff of the TDC

is done from time to time at vegetative, flowering and maturity stages of the crop. The farmers are advised about the shortcomings if any and suggestions to overcome them on the spot are done by the staff. The seed plots meeting the standards above the minimum seed certification standards are allowed as seed crop and a field sample is drawn from each lot after proper threshing, packing and sealing and subjected to vigorous seed analysis. Seed lots meeting certification standards at seed level, as pre-intake test, are allowed to move to the processing plants.

On arrival at plant, another sample is drawn from the produce at the plant before a particular lot is subjected to various steps of processing. On the basis of Before Processing Sample (BPS), test result processing procedure is adopted, and specific attention is paid to every seed lot as per requirement. The drying up of seeds as per specifications is done passing the particular lot through indented/disc/cylinder or spiral and gravity separator. At the time of processing, every care is taken in quality seed production and finally a sample is drawn after processing by us as well as UP State Seed Certification Agency, an official authority for seed certification in Uttar Pradesh. The seed lots meeting certification standards as per our tests as well as the tests carried out by UP State Seed Certification Agency, are allowed to move to the buffer godowns maintained at various divisional levels. The Corporation always endeavors to maintain much higher standards that the ones prescribed in the Minimum Seed Certification Standards.

Area of Operation

The seed production work is organized in the state of Uttar Pradesh and some contractual production is organized in the other states also. There are the 8 regional offices located in Haldi Pantnagar, Kashipur, Meerut, Aligarh, Kanpur, Varanasi, Faizabad, and Gorakhpur.

Crop Varieties Produced by TDC

At present the Tarai Development Corporation is producing 151 varieties of 43 crops. Brief accounts of main crops that are distributed by TDC are mentioned below.

	Kharif Crops	
1.	Paddy	Sarju 52, Pant Dhan 4, Saket-4, Mahsuri, Sita, IR 36, Ratna, Narendra 80, Govind, Usar 1, Ashwani, Pusa Basmati-1, Narendra 118, Kasturi, BC 370, Pant Dhan 10, MTV 7029, PNR 381, VL-16, HKR-228, Pant Dhan 6, Pant Dhan 11, BP T 5204, MTV 7029, PNR 381.
2.	Maize	Naveen, Sweta, Kanchan Surya, D 765, VL- 42.
3.	*Urd*	T 9, PU-19, PU-30, PU-35.
4.	*Arhar*	UPAS-120, T-21, Bahar.
5.	Groundnut	ICGS 37, ICGS 44, Kaushal, Chitra.
6.	*Bajra*	ICTP 8203, ICMV 155.

	Rabi Crops	
1.	Wheat	HD 2329, UP 2003, HD 2285, HD 2428, PBW 154, PBW 226, HUW 206, HUW 234, Sonalika RR-21, UP 262, UP 1109, Raj 3077, Sonali, WH 542, WH 174, SANGAM, Lok 1, Kundan, VL 616, VL 421, K 8020, K 8027.
2.	*Lahi*	T9, PT 303, PT 3O.
3.	*Rai*	T 59, Rohini, Vardan, NDR 8501.
4.	Gram	Avrodhi, Radhey, Pusa 267, Pusa 256, K 850, PG 114.
5.	Pea	Rachna, Aparna, Pant 5, HUP 2.
6.	Lentil	K 75, PL 234, PL 639, PL 406, PL 4.

	Spring crops	
1.	Sunflower	Morden, KBSH 1.
2.	*Moong*	T-44, Pant 1, Moong Pant2, Moong Pant 3.

	Vegetable crops	
1.	Peas	Arkel, Azad
2.	*Dhania*	PD I
3.	*Methi*	Pusa Early Bunching, Kasuri
4.	*Tinda*	Arka

Apart from providing the necessary seeds for the seasonal crop/ vegetable the TDC provides pamphlets and information brochures. These pamphlets are distributed free of cost to the farmers to educate them on the various aspects of planting, maintenance and care of seedling. The main aspects covered in the brochures is the type of crop, its variety, number of seeds to be sowed in unit area, the time of sowing, method of sowing, time of transplantation, distance from row to row, between the seedlings, depth to which sowed, time of harvesting, yield per unit area, important features of individual crop, manure and fertilization, preparation of field, irrigation schedule, control of weeds and pests, plant protection and details about the final harvest are mentioned.

Certified Seed

The seed after been certified are labeled with a post card size certificate. The UPS & TDC has eleven points which give a fair amount of knowledge to the buyer or supplier the status of the seed. The label consists of the following information:

Label number, crop, variety, lot number, date, month and year of test, valid upto, germination including hard seeds, physical purity, genetic purity, weight while packing, preservative used.

Facility Extended to the Seed Growers

❑ In Seed Production

- To ensure targeted production, foundation seed is distributed to the seed growers at the nearest place to their destination by sending teams for distribution.
- Payment of their produce is made at the nearest place by establishing Accounts office is done at the accounting offices in all the Regional Offices of the areas concerned.
- The Corporation provides technical guidance and supervision from time to time.
- The Corporation pays the better price to its seed growers, which is 10% to 15 % higher than the others.
- The Corporation makes arrangement for the registration of the seed growers with the Certification Agency instead of bothering the growers themselves. They are encouraged for foundation seed production seed production, so that they are trained for higher skill of seed production and as well as able to get more price for their certified seeds.
- Arrangement are made for the intake as near as possible to their place by opening Collection Centers and they also given transport rebate for bringing their seed to the Seed Processing plants of the Corporation, if the distance is above the prescribed limits.
- To ensure quality of intake as well as for the facility to the growers, they are provided twill Bags free of cost

❑ Finance and Accounts

- For an early payment to the growers, the Corporation has made an arrangement with the banks for the "D.D. at par' facility, free of charge. Wherever the facility is not extended, the financial charges are being borne by the Corporation.
- The farmers are paid remunerative prices of the seed, which is fixed having taken into account the opportunity cost of the seed and other related cost ingredients.
- The farmers who have to bring their seeds beyond a certain distance from the location of the plant are provided transport subsidy, which mitigate their financial burden.
- The farmers need working funds therefore the Ist installment of the total paytment is immediately made on the intake at the plant. The payment is higher than the market or the support price, whichever is higher. After processing of the seeds the farmers are made their final payment. In adverse circumstances, the interim payment is also made.
- The farmer payment is regularly monitored and it is ensured that the payment is made within a week from the date of supply.

Marketing

The main objective of marketing is to make available the latest and the best quality seeds as per the requirement of the farmers in time, within 5 kms of the field and at the most reasonable price. The seeds of crop varieties that are to be made available are planned for production according to the requirement based on the facilities available to the requirement based on the facilities available to the land of the farmers including the natural resource. Specifically in case of certified seed, minimum planning of three years is essential for making available requisite quantities of the crop varieties of seed in time i.e. one year of production of Breeder, Foundation and Certified seeds. The Corporation has played a pivotal role in the preparation and execution of 5-year Seed Plan at the state level. On the basis of the demand so worked out, the producing agencies are given the responsibility of production of certified seeds one year in advance; corresponding production of the foundation seeds by the responsible agencies 2 years in advance and production of Breeder seeds in 3 years in advance. The State Seed Plan also provides for the introduction of the latest varieties found suitable during the plan period. Timely availability of seeds is the essence of the Seed Plan. The targets of timely availability of seeds fixed in the seed Plan against the sowing period are:

Crop	***Normal sowing time***	***Time fixed for providing seed at sale points***
Kharif	June-July	30th April
Zaid	February- March	31st January
Rabi	November- December	10th October

Distribution and Transport System

As per the terms and condition set out by the Corporation the distributor has to reserve its accepted indent almost 4 months before the actual sale time covered with 10% advance. Crop/varieties of the seeds are available at the regional godowns according to the reservations made by different distribution agencies. These distribution agencies sell the stock to the farmers at the retail stock fixed by the government. The dealers get the commission of 9 % and the distributor between 2.5 to 4.5 % on the slab basis, which is quite remunerative to them. In case of states other than U.P., the stock is supplied by wagons directly to the payments of 25% advance and remaining cost through the Bank and Regional Office before delivery of the Railway receipts. The Dealers and Distributor also get stocks from our buffer godowns.

The seeds as soon as processed at the Seed Processing Plants, are to be transported to the different storage godowns as per the area requirement. The transportation is made through road and rail; which ever is economical for carrying-out, the transportation work. Reputed transport companies are appointed on yearly contract to carry out the safe and timely transportation. The transportation by any means is insured for any risk enroute.

Present Scenario

The seed production for the year 1999-2000 was 10.85 lac quintals whereas the projected target for the year 2000-2001 would be 11.87 lac quintals. Whereas the seed distribution achieved for the year 1999-2000 was 8.07 lac quintals, the target for the year 2000-2001 is 11 lac quintals. The achievements of the TDC are a record certification of 7.00 lakh quintal seeds of different crops was achieved for the year 1999-2000 rabi season. In the year 1998-99 an area of 39,086 hectares of land was undertaken for seed production activity. A new record in vegetable seed production of 20,000 quintal was achieved in the year 1999-2000. Opening up of sale counters for vegetable seeds in regional offices. To promote kitchen garden TDC is marketing rabi and kharif kitchen garden packs.

TDC thus, signifies that with the help of farmer's participation, a Corporation can achieve remarkable success. The policies are for the interest of the farmers. By lending the farmers the necessary technical support the Corporation has earned the goodwill of the local people. The farmers being the producers as well as the consumers of the seeds are considered during the decision making process. The TDC has the seed producers- farmers close to their door. The farmers being part of the management and decision making bodies have ensured until now that the farmer's interest has not been hampered. The Co-operative thus run with the close association with the farmers ensures that it has a motto for the farmers, by the farmers and of the farmers. The bond is so strengthened that the farmers see the TDC as the only reliable source of seed in the Tarai region.

2. Strengthening Community Seed Sovereignty : A Case of Navdanya Conservation of Agricultural Biodiversity

Conservation of agricultural biodiversity is impossible without the participation of the communities who have evolved and protected the plants and animals that form the basis of sustainable agriculture. In agriculture, in-situ conservation strategies are impossible to separate from sustainable utilisation and production methods.

The *Navdanya* initiative (a programme of the RFSTE), which began in 1987 in response to the crisis of agricultural biodiversity, has grown into a national movement for a democratic and equitable food security. The programme combines conservation of agricultural biodiversity with the assertion of farmers' rights to their knowledge, resources and technology. Similarly, people's right to food and food security encompasses their right to livelihood and to safe food.

The *Navdanya* programme works for promoting ecological agriculture based on biodiversity, for economic and food security. Agricultural diversity can only be conserved by biodiversity-based production systems. The programme works with farmers helping them shift from monoculture to AGRIculture - sustainable agriculture based on biodiversity - through demonstrations and workshops on seed conservation, seed development, pollinators, maintaining soil fertility through composting and use of soil micro-organisms, biodiversity based pest and disease control.

The struggle for seed, for agriculture and for the protection of the environment and of livelihood is the most vital struggle of our times. The challenge lies in not just taking on the corporate might of the market drivers, but in also devising ways to make sustainability with equity the core of existence.

The *Navdanya* Movement - nine seeds movement - for conservation of agricultural biodiversity on farmers' field is one such movement, where farmers in many parts of the country are actively involved in conserving not just hundreds of varieties of rice and wheat, but are striving to bring back into cultivation the numerous ecologically prudent crops that have almost vanished - millet varieties, pseudocereals, pulses, etc.

The *Jaiv Panchayat* Movement - Living Democracy Movement - is an offshoot of such conservation activities, and was born as people perceived the threat that IPRs posed to their natural resources. The Movement places control over the natural resources with the Gram Sabha or the community, and makes them the final arbiters of who will use the biodiversity and how.

Movements to protect the small family farm and to rejuvenate organic agriculture are mushrooming all over the world.

The Navdanya *Initiative for the Conservation of Seed Biodiversity*

The conservation of biodiversity requires action at many levels. It requires *in-situ* or on-farm conservation of all biodiversity, especially agricultural biodiversity. It also requires that biopiracy be challenged at the local, national and international levels. It further requires the defence of community rights to natural resources including biodiversity and knowledge about it.

Farmer-based in-situ Seed Conservation and Exchange

Navdanya is primarily concerned with facilitating *in-situ* seed conservation and seed exchange of traditional varieties by local groups and communities for the preservation of agricultural biodiversity and to protect farmers' rights to seed. The movement has grown into a national network of community seed banks and *in-situ* conservation programs. *Navdanya* sees its role in seed conservation as a catalyst, creating an ever widening circle of awareness at many levels from the micro to the macro, stepping in to facilitate local groups and communities to take up seed conservation activities and then stepping out when the local capacities have been built up.

Navdanya's efforts have resulted in the conservation of more than 1000 rice varieties from all over the country including indigenous rice varieties that have been adapted over centuries to meet different ecological demands. These include dryland varieties that require only one shower a year, varieties that grow more than 8 ft. tall and are adapted to waterlogged, flooded conditions, as well as varieties with distinctive medical and health benefits. Crops such as millets, amaranth, buckwheat, pulses have been promoted and saved from being pushed out by expanding monocultures.

The *Navdanya* philosophy of farmer-based agricultural biodiversity conservation is spreading throughout the country. The objective of the conservation programme is to empower local farming communities to protect and regenerate genetic diversity and the knowledge systems that support it.

It was felt by Navdanya that it is very essential to conserve the agro-diversity in the fields of the farmers to preserve and protect it from extinction. Navdanya started conservation of crops and other important plant varieties in early nineties. The species as well as varietal diversity is also required by the scientists also to further their research. Navdanya's programme of seed conservation, distribution and exchange helps in achieving this objective *vis a vis* in conservation of indigenous seeds and plants. Farmers exchange their seeds with seed banks for the desired seeds and variety. In exchange they give their seeds varieties for conservation in Navdanya's regional seed banks. Navdanya also promotes seed exchange amongst the farmers.

Navdanya's efforts have resulted in the conservation of more than 2000 rice varieties from all over the country including indigenous rice varieties that have been adapted over centuries to meet different ecological demands. We have also conserved 50 varieties of wheat and hundreds of millets, pseudocereals, pulses, oilseeds, vegetables, fruits, orchard and multi purpose plant species including medicinal plants. Till date Navdanya's biodiversity conservation farm in Dehradun has conserved:

· 12 genera of cereals and millets
· 16 genera of legumes and pulses
· 50 genera of vegetables
· 7 genera of oilseeds yielding plants
· 13 genera of spices and condiments
· 20 genera of aromatic plants
· 54 genera of fruit and flower yielding plants
· 250 genera of ornamental, timber and medicinal plants

Navdanya pioneered the movement of seed saving, which began in response to the crisis of agricultural biodiversity and has established 40 seed banks in 16 States across India, as we believe in operating through a network of community seed banks in different ecozones of the country, and thus

Limitations of *ex-situ* collections in gene banks

The last three to four decades have witnessed increasing concern over the loss of agricultural biodiversity. Institutions like CGIAR, NBPGR, IBPGR, ICRISAT, have been expressly created to start and maintain *ex-situ* collections so that a constant and reliable supply of diverse plant genetic material is readily available.

However, gene banks have failed to conserve biodiversity because their concept is based on three flaws/inadequacies:

- The scientific basis on which the concept of *ex-situ* rests is based on the 'germplasm' theory, which holds that plant genetic material can exist independent of both the plant itself and the environment in which it grew, as well as the environment in which it is stored. This assumption has been proved false.
- The technical problems include the difficulties associated with constant power supply, regular servicing of machinery, lack of staff and storage space, and limited facilities for regenerating material.
- Political inadequacy of national and international gene banks stems from the fact that while the seeds available to them are supposed to be available to farmers, public sector research institutions and to the private sector, they are, in actual practice, most accessible only to the last, and very rarely to the first. Gene banks also cannot challenge the very broad-based IPR protection the private sector seeks and often gets on the characteristics of varieties stored with and developed from varieties taken from them. As these varieties are mainly farmers' varieties, gene banks have no mechanism for protecting farmers' rights.

On Garhwal, where Navdanya has been working for a long time, many farmers have converted to traditional farming and have completely abandoned the chemical farming. One valley has now been completely free of chemicals and about 30 village in that valley don't use chemical pesticides and fertilisers at all. And we hope that in coming three – four years the whole Pauri district will be a chemical free zone. Over 10,000 farmers have already taken a pledge on the initiative of Navdanya that they would not use any chemical fertiliser, pesticides, MNC's seeds and patented seeds and practice their traditional farming and use our indigenous seeds.

- Darwan Singh Negi, Kotdwar, Pauri Garhwal

facilitating the rejuvenation of agricultural biodiversity, farmers self reliance in seed locally and nationally, and farmer's rights.

- 365 landraces of paddy
- 31 landraces of wheat
- 11 landraces of barley
- 5 varieties of barnyard millet
- 10 varieties of oats
- 6 varieties of finger millet
- 3 varieties of foxtail millets
- 7 varieties of mustard

Apart from these, seeds of several economically important plants are also being conserved. In addition Navdanya is also conserving more than **450 different medicinal and multipurpose perennial trees used for fodder and timber**.

Farmers in in-situ conservation

The programme's *in-situ* require the participation of four kinds of farmers:

1. Farmers who continue to use and conserve diverse varieties. In general, these are small peasants in marginal or remote areas which were left out of the Green Revolution as they did not have the necessary resources to shift to resource- capital- and chemical-intensive agriculture. Marginal farmers in marginal regions are thus the source of rejuvenation of agricultural biodiversity. They are the seed savers or *beej rakshaks*.
2. Farmers whose agriculture biodiversity has been eroded but who feel the ecological, economic and political imperative to reintroduce diverse species and crop varieties for ecological food security. They become *beej rakshaks* by introducing diversity from farmers who have conserved seed through community seed banks and exchange networks. For example, the *Navdanya* seed bank in Garhwal region gave organic rice varieties to farmers from Bhatinda in Punjab, whose declining yields and increasing debts caused them to shift to organic farming. These seeds, without any external input, have given a yield of 19 quintals/ha, while the best hybrids, with all the chemical and water inputs have given just 22 quintals/ha. Similarly, saline-resistant seeds conserved by

> The farmers of Orissa have come together and formed Jaiv Panchayats through which they hope to and are inspired to fight and resist the impact of globalisation. The Jiav Panchayats are under oath to preserve and conserve the local paddy varieties and other variety at any cost, to maintain their right to seed, to maintain their fundamental right to produce food, feed themselves and feed the people.
>
> We have shunned the use of chemicals and have developed methods of composting indigenously which maintain the yield of paddy compared to HYV. Our normal paddy yields about 16 to 20 quintals per acre. We have produced paddy upto 16-20 quintals in an acre using organic manure. In vegetable production we use vermi wash and it has tremendous effect. With the use of organic manure and fertilisers we can do away with the chemical fertilisers that contaminate our fields.
>
> After the neem victory the Orissa farmers have developed more confidence and started planting neem trees along the village roads and they are now using the neem oil, and neem cake as pest control mechanism.
>
> ***- Ashok Panigrahi,*** *PPBSA, Balasore*

the *Navdanya* programme in Orissa have helped the victims of the supercyclone that hit Orissa in October 1999 re-establish sustainable agriculture.

3. As the number of farmers wanting to shift to ecological agriculture increase, farmers are required for strengthening seed supply. Farmers who become seed producers - multipliers - for the community seed banks are *beej utpadaks*.

4. Given the rapid erosion of biodiversity through the spread of monocultures and export-oriented agriculture, many species and varieties have lost their utilisation value due to market forces. Farmers who conserve these species and varieties *in-situ* for their biodiversity and possible future value are an important part of the *Navdanya* programme.

Community Seed Bank Network

The *Navdanya* programme operates through a network of community seed banks in different ecozones of the country, and thus facilitates four types of rejuvenation:

- Rejuvenation of agricultural biodiversity as a common property resource;
- Revujevnation of farmers' self-reliance in seed locally and nationally;
- Rejuvenation of sustainable agriculture as the foundation for food security, both locally and nationally; and
- Rejuvenation of farmers' rights as common intellectual and biodiversity rights of agricultural communities.

Farmer - Consumer Linkages

The last but vital link in the network for conservation of agricultural biodiversity is the consumer of this biodiversity, as regular consumption is be best way to conserve biodiversity. *Navdanya* is the first initiative in India to have started direct marketing of organic produce from *Navdanya* farmer members to *Navdanya* consumer members. More than 2000 members participate in its biodiversity conservation, organic production or organic consumption.

Navdanya's involvement in issues of biodiversity conservation emerging from a concern for peoples' rights to natural resources and sustainable livelihood, has led to pioneering contribution in linking trade issues with issues of ecology and gender equity. Through participatory research, the Foundation has given scientific support to social movements like Chipko, farmers' movements, and movements for the conservation of biodiversity and peoples' rights. The Foundation has launched several campaigns and movements for the protection of peoples' life and livelihood e.g. *Neem Campaign, Beej Yatra, Bija Satyagraha, Jaiv Panchayat, Lok Swaraj Abhiyan,* etc.

Initiatives in Defence of Community Rights to Biodiversity and Knowledge

Third World countries including India have provided the world with most of its agricultural crops and medicinal plants. These crops, which have been

developed primarily from farmers' varieties and indigenous healers' knowledge, are being usurped by corporations through IPR systems that promote biopiracy to create monopolies over resources and knowledge.

The defence of community intellectual and biodiversity rights are thus indispensable for the protection of community rights.

Community Intellectual Rights to Counter Biopiracy

To counter biopiracy it is mandatory to forge a Community Intellectual Rights (CIR)* movement. Collective and community nature of the innovation and rights related to indigenous biodiversity utilisation are called CIR. The CIR movement is essentially based in the idea of sovereignty of the community. It is concerned with the recovery of the intellectual commons and restoring power back to the people.

The Defence of CIRs is possible through

- Maintaining CIRs by keeping the knowledge alive and vital through regular use.
- Maintaining Community Biodiversity Registers to challenge instances of biopiracy. These registers give proof of 'prior art' or the existence of knowledge and technologies developed by communities in relation to biodiversity. As the majority of biodiversity-related patent claims, particularly in the fields of food production, agriculture and medicine are built on indigenous knowledge and traditional practices related to biodiversity use, community biodiversity registers are a vital tool for preventing the grant of such patents.

The Community Seed & Biodiversity Register

The US and EU suggest that documentation of biodiversity-related knowledge be done by WIPO on computer databases - this will erode and push to extinction oral knowledge, it will further disempower local communities and those who actually generate and carry knowledge. It will create a bioprospecting technology and a documentation of knowledge by experts, and it will not be used for sustainable production.

A Community Biodiversity Register (CBR) is the documentation of the resources and the knowledge of local communities at the local, regional and national levels by the people themselves for the purpose of rejuvenating the ecological basis of agriculture and the economic status of the community.

The Community Biodiversity Register

- ensures acknowledgement of alternative knowledge systems which recognise the informal, collective and cumulative systems of innovations of indigenous peoples and local communities;
- consonant with this, defines innovation broadly to include not just the

* The concept of Community Intellectual Rights and Community Biodiversity Registers was initiated by RFSTE/*Navdanya* and other groups in the 80's and has since been developed in diverse ways by various groups, NGOs and communities to express diverse priorities.

technologically improved end product, but knowledge relating to the use (or enhanced use) of properties, values and processes of any biological resource. This definition can be wide enough to include any alternation, modification, improvement or derivative which utilises the knowledge of indigenous groups or communities in the commercialisation of any product, as well as more sophisticated processes for extracting, isolating or synthesising the active chemical in the biological extracts or compositions used by the indigenous peoples and communities;

- makes local communities/indigenous peoples the custodians or stewards of such innovations, defining such rights as 'non-exclusive' and 'non-monopolistic' and encouraging its non-commercial and free use and exchange;
- permits such rights to be held in common with other communities/ indigenous peoples.
- prevents the erosion of knowledge in communities. As knowledge about biodiversity becomes eroded, and only a few remember it, corporations find it easy to steal the knowledge and pirate it, as it has already vanished from the commons.

The act of locally building up such a register serves many purposes.

- It makes the people aware of their rights to seed, food and medicines, and more empowered to challenge biopiracy and resist monopolisation of knowledge through IPRs.
- It provides the community with a means to assert rightful sovereign control over what is their own and better equips them with bargaining power.
- It is an instrument for building self-rule in the management of biodiversity.

The CBR is owned by the community, maintained by the Gram Sabha, and documented by all those who use the biodiversity, especially women and children. This ownership by the community gives the community the right to set the ethics and laws for biodiversity governance and management, including siting disputes (even the international disputes) at the community level.

However, since community needs and community rights also need to be recognised and taken into account in national policy formulation, the CBRs serve as the basis for building a national community biodiversity register.

The Community Seed Biodiversity Register

The CBR, when it documents only seeds and plant varieities, becomes the Community Seed Biodiversity Register. By making farmers' varieties freely accessible to other farmers across the country, the region and the world, the register rejuvenates agricultural biodiversity, people's knowledge and sustainable agriculture.

Access to traditional varieties revitalises the role of the farmer as a plant breeder, and strengthens his resistance to seed monopolies. By acting as a seed catalogue, it assists seed exchange between farmers, which shrink the market for corporate seeds. Such exchanges help farmers and farming communities retain agricultural freedom and economic control over agriculture.

In order to effectively challenge IPR claims by the private seed sector, the Community Seed Biodiverstiy Register must be as complete as possible. The documentation needs to include:

- farmers' nomenclature and farmers' classification systems
- the names of the farmers growing the variety
- agronomic details such as type of soil, flowering time, harvest, yield, etc.
- taxonomic details such plant length, awn length, leaf length, colour of various parts, weight of seed, etc.
- other details such as cooking time, starch content (if possible), flavour, aroma, and so on.
- Details of medicinal use if any
- Details of uniqueness

Navdanya organised the **Beej Milan** - International Organic Farmers' and Seed Keepers' Gathering - represented hope for a sustainable and equitable future at the dawn of new millenium. The Gathering brought together more than 200 farmers and seed keepers on 3rd and 4th October at Navdanya's Agro-ecology and Biodiversity Farm in Dehradun to celebrate diversity and renew their vow to keep agriculture and biodiversity free and in the commons.

The four pillars of ecological agriculture, that were also the themes at the Gathering, are:

- Seed Conservation
- Composting
- Pest Management and
- Marketing.

Farmers from all over shared their experience of seed conservation, including drying and storage methods. Organic seed conservation differs from institutionalised seed conservation in many ways. Seed conservation by farmers is through its regular cultivation, allowing the seed to evolve and adapt to new conditions. Navdanya Orissa, which alone is conserving 400 local varieties of paddy, has set up seed banks and grain banks to ensure food security in the four districts where it operates. It could thus supply saline-resistant indigenous varieties to farmers in the region devastated by the supercyclone of 1999, where commercial and public sector varieties had failed.

Conservation of indigenous agricultural biodiversity necessitates ecological agricultural practices which renew earth's fertility. The participants discussed the merits of various methods of composting, including NADEP composting, Heap method, Biodung method and Vermicomposting. Harish Mishra of Orissa informed that by using seeds of health paddy plants with good phenological characteristics and a mixture of cowdung and poultry litter, he has been getting an annual yield of 5qtl./bigha, which is better than most Green Revolution varieties.

> We have formed Jaiv Panchayat in more than 100 villages in Garhwal. We are documenting and recording every living resources found in each village and the Biodiversity Register is kept with the headman of the village. We have also prepared herbarium of the different living resources of each village.
>
> We have been doing a programme called Sagwari where we encourage village kids to grow vegetables for the own consumption so that they don't forget their farming tradition.
>
> ***Mr. Chandra Shekher Bhatt,***
> *Agastyamuni village, Rudra Prayag, Uttranchal*

Mixed cropping and crop rotation, which are vital to successful organic farming, are themselves an extremely important insurance against disease and pest attacks and total crop failure. Farmers shared other pest management methods that included the use of neem, *vitex negundo*, and cow's urine. A farmer from Baghpat shared his method for controlling termites. He scatters a mixture of rice and sugar over his fields. The termites come out for the rice. Ants, which arrive for the sugar, take the termites instead, and leave his fields termite-free.

Regular cultivation and consumption is necessary for keeping agricultural biodiversity alive. The participants discussed various methods to improve awareness and demand for organic, chemical-free food. *Navdanya Foods*, the direct marketing initiative of Navdanya, where farmer members deal with consumer members and get a 20% premium on their products, was one of the models considered for large-scale replication.

Ecological agriculture is not possible unless biodiversity is in the commons, and is free from the threat of extinction posed by technologies like genetic engineering. The *Jaiv Panchayat* - Living Democracy - Movement initiated by Navdanya to keep biodiversity in people's control, has spread widely, particularly in Orissa and Garhwal. There are 85 *Jaiv Panchayats* in Garhwal alone, where people have asserted their inalienable and common rights to their natural resources. In many of the *Jaiv Panchayats,* the elected village leaders are also the leaders of the Movement. Many of them have declared their villages GM-fee zones as well. Almost all of them are in the process of compiling their Community Biodiversity Registers.

The two days also gave the farmers a chance to display their histrionic and musical skills through plays, skits and songs that conveyed the message of organic agriculture and resistance to corporate takeover, and their culinary skills by taking turns to provide diverse foods from their region.

Thus we see that how the seeds in the hands of community and in public control spreads the message of diversity and hope among the generations to come.

Seeds of Life, Seeds of Hope: Asha Ke Beej

Asha Ke Beej (Seeds of Hope) *programme is an emergency supply of indigenous varieties of seeds in those regions, which are worse affected, either by the natural calamities like cyclone in Orissa, or as result of the policies e.g. Punjab and Andhra Pradesh.*

Under the "*Asha ke Beej*" programme Navdanya continued its efforts to supply seeds to those who are in the need of it and have lost their indigenous varieties due to Green Revolution policy of the government.

Hundred quintals of 3 native varieties of saline resistant Kharif paddy varieties were collected from Balasore and Bhadrak districts of Orissa for distribution to the Tsunami affected farmers of Nagapattinam district in Tamil Nadu.

Navdanya/RFSTE, over the last one decade has been actively involved in the conservation and exchange of indigenous, seeds, including drought, flood and saline resistant paddy seeds. Through its "Seeds of Hope" program, started in the year 1999, Navdanya has given hope to the victims of Tsunami. More

than 5203.73 hectare of agricultural land in Nagpattinam was also affected by the Tsunami. Navdanya team conducted a study in the affected villages to facilitate the agriculture recovery.

Navdanya decided to provide saline resistant varieties of paddy to the farmers of the worse affected areas. Three varieties of native saline resistant Kharif paddy seeds collected from Navdanya farmers from Orissa amounting to total of 100 quintals was packed in 225 bags and transported to Nagapattinam on 4th July 2005. These paddy seeds comprising of 3 native popular varieties such as Bhundi, Kalambak and Lunabakada were handed over to Mr. Muthuval, Deputy Director of Agriculture, Nagapattinam for safe custody and later distribution in the month of October in the beginning of Kharif season. The saline resistance varieties of rice were distributed to the Tsunami affected farmers in Nagapattinam to help them in the revival of agriculture. The results of the Seeds of Hope program have been remarkable.

On the 26th of December 2004, the Killer Tsunami Wave had lashed and ravaged the coastline of Tamil Nadu – leaving colossal damage and misery in its wake. The Tsunami waves have also affected agricultural lands due to intrusion of seawater and deposition of sea land. To assess the damage and the intervention required for the agricultural recovery Dr. Vandana Shiva, Director Navdanya/RFSTE visited Nagapattinam in January 2005, just after Tsunami, which was subsequently followed by the visits of Navdanya/RFSTE team. Navdanya team conducted a study in the following villages to facilitate the agriculture recovery.

Nagapattinam Taluk

1. North Poigainnallur
2. South Poigainnallur
3. Karuvelankadai

Kilvelur Taluk

1. Vellangani
2. Prathaaramapuram
3. Kamesharam (Tirupoondi East)
4. Vilunthamavadi
5. Vettaikaran irrupu

Navdanya seeds have been grown in the country since last several centuries. Earlier too, the seed distributed by Navdanya after Orissa Cyclone helped the farmer in revival of agriculture.

RFSTE/Navdanya, apart from providing guidance and help to the farmers for the revival of agriculture, distributed saline resistant seeds in these villages. The network of Navdanya farmers in Orissa provided these seeds.

To disseminate the information about saline resistant paddy seeds and other intervention for the agriculture recovery, a two day workshop, "Workshop on

Regeneration and Revival in Tsunami Affected Areas: A Six-Month Stocktaking" was organized by RFSTE/Navdanya on 9th and 10th July at V.P.N. Hotel, Nagapattinam, Tamil Nadu. The Additional District Magistrate Shri Ranbeer Prasad, (IAS) inaugurated the workshop. He gave the details of the impacts of Tsunami.

Dr. Ashok Panigrahi from Navdanya programme Balasore in Orissa talked about the experience of Orissa Cyclone where Dr. Panigrahi along with Navdanya had distributed the saline resistance seed to restore the agriculture productively. He also explained about the necessity and importance of organic farming. He shared the infromation that the survey of U.S. Satellite reveals that 37 million of tonnes of methane is released from paddy fields. This methane comes from chemical fertilizers, particularly nitrogen based fertilizer. He suggested that we should adopt organic farming to avoid the release of methane. As in Nagapattinam, soil conditions have become saline. Dr. Panigrahi brought three kinds of seeds i.e. Kalambak, Luna Bakda and Bhundi for the distribution among the farmers, which are suitable for low, medium and high saline agricultural land respectively.

Subhashini Sridhar, from Centre of Indian Knowledge System (CIKS), Sirkazhi, discussed about the pH values of different kinds of land; acidic, alkaline, saline and sodic. She emphasized on the need for applying bio-pesticides for recovery of agricultural productivity.

Dr. Debal Deb from Navdanya programme in West Bengal and Centre for Interdisciplinary Studies (CIS), Barrackpur mainly focused on the traditional rice varieties. There were 65000 rice varieties all over India. In West Bengal out of 6000 rice varieties, only 300 are left. Unknown farmers have developed many varieties, which remained unnoticed. He explained the characteristics of some rice varieties, which contain iron and Vitamin B complex. He also explained about certain magical rice varieties e.g. *sateen;* the three rice grain.

Mr. Ramamurthy, an Honorary Forest Officer discussed about the significance of mangrove forest. Mangrove is of great importance. The best place where mangrove can survive is the mouth of the sea. Despite the significance of mangrove to reduce the impact of Tsunami and Cyclone, Mangrove forest has been devastated to serve the international commercial interest.

At the end of the workshop, there was interaction with the farmers and beneficiaries. Shri I. Muthuvel, Joint Director of Agriculture Nagapattinam explained to the farmers about the quality of saline resistant seeds provided by Navdanya programme from Balasore, Orissa. Mr. Muthuvel also distributed the seeds to the farmers who were present there. The remaining of the seeds were distributed in the Kharif session of 2005.

In December, 2005 for the anniversary of Tsunami, Dr. Shiva and Mr. Kunwar Jalees joined the communities for assessing the work of the past year and planning long term rehabilitation strategy. Dr. Shiva with the District Magistrate, Dr. J. Radhakrishnan, addressed a rally of more than 5000 women determined to create a new future and defend their rights.

Navdanya once again through its Seeds of Hope programme decided to provide farmers of Kashmir valley with the seeds for next crop, which they lost during the recent earthquake. Navdanya has selected Pulwama in Jammu and

Kashmir for the programme. The district was carved out of Anantnag and came into existence in 1979. The district, situated 32 Kms from Srinagar in South Kashmir, is surrounded in the north by Srinagar, in the west by Poonch and Badgam and in the east by Anantnag. Majority of the population i.e. 88% speak Kashmiri language while the rest speak *Phari and Gujri*.

Agriculture is the main occupation of the people with small number raring cattle for livelihood. The main crops in the district include Paddy, Maize, Mustard, Spices and Pulses. The world famous saffron fields adorn the district and the cherished traditional apple, *Ambree*, is also grown here.

Pampore, in district Pulwama, is the only place in the world besides Spain where saffron is grown. The *Crocus sativus*, which blooms for a brief month in the year, has six golden stamens and one crimson one. It is the crimson stamen which when collected and dried is referred to as the most expensive spice in the world. But this is fast moving to a dead end because of the unsustainable conventional agricultural policies and wrong policies of the government.

Initially the Biodiversity conservation work will be started in five villages of Pulwama district of Jammu and Kashimir, namely: Sambura, Pampar, Batherhama, Zawoora and Hadu

Villages *Sambura* and *Pampar* are part of Thesil *Pampore*, which is famous the world over for Saffron and rice cultivation. While villages *Batherhama, Zawoora* and *Hadu* are part of the *Shopian* Tehsil, which is also known as the fruit bowl of Kashmir.

The programme aims at starting with five farmer families in each of the above village to start with i.e. approximately 125 farmers for conversion to organic. In the long run the biodiversity conservation programme aims to cover whole of Kashmir and Ladakh.

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BIJA YATRA 2006-2007

Seeds of Suicide, Seeds of Slavery, Seeds of Despair

10 years of WTO, has left our agriculture in ruins and our farmers in debt. 40,000 farmers have committed suicide as a result of indebtedness and the resulting threat of land alienation.

Farmers' suicides are concentrated in the regions where corporations like Monsanto have established a seed monopoly, selling costly and unreliable hybrid and GM seeds like Bt. Cotton. These are also regions where farmers have become locked into growing cash crops integrated to world markets, which is leading to a collapse in farm prices due to 400 billion dollar subsidies in rich countries.

Rising costs and falling prices have led to the genocide of our farmers.

We are Committed to Stopping this Genocide. We Renew our Commitment to Defend our Freedom and our lives.

"One man robbing another of food,
Can this custom last?
One man watching another suffer,
Can such life survive?
Survive before our eyes,
Survive here in our midst?
Lovely gardens, spacious fields,
Innumerable enrich this land,
Fruits and tubers, and grains in plenty,
Immeasurably it yields,
For ever and ever it yields!
(Long Live Bharat Commonwealth)"

- Subramania Bharati

Sowing Seeds of Life, Seeds of Freedom, Seeds of Hope

Under British rule peasants of Bengal and Bihar were starving because they were forced to cultivate indigo. This led to the famous indigo revolts of the last century and the Champaran satyagraha in the 1920s.

In 1942, two million people died of starvation while rice was being exported by the British rulers.

This led to the Tebhaga uprising during which the peasants declared, *"Jan debu, dhan debu na" ("We will give our life, not our rice")*.

The mitigation of farmers' suicides and the agrarian crisis calls us to renew the spirit of defending of our food sovereignty and seed sovereignty by building a people's movement. For this, a Bija Yatra 2006-2007 was launched on 9th May 2006.

The Yatra started from Sevagram, District Wardha, Maharashtra which was concluded on 26th May in Bangalore. The Yatra covered Amravati, Yavatmal, Nagpur in Vidarbha region of Maharashtra, Adilabad, Warangal, Karimnagar, Hyderabad in Andhra Pradesh, and Bidar, Gulbarga, Raichur, Hosepet, Chitradurg and Bangalore in Karnataka.

The Yatra was jointly organized by Vidharbha Organic Farmers Association, Maharashtra Organic farmers Association, Andhra Pradesh Rytu Sangham, MARI, All India Kisan Sabha, Karnataka Rytu Rajya Sangh, Bharat Krishak Samaj, Navdanya and Other activist and organization.

We distributed indigeous seeds; seeds of freedom and seeds of life. We have taken the pledge to defend our seed sovereignty and food freedom. We will boycott Monsanto's Bt. Cotton and poisonous agri-chemicals that are killing our farmers and the environment. No farmer in India should be dying. India is not free if her farmers are enslaved and indebted. We will not rest till our villages are GMO Free – Patent Free – Debt Free – Suicide Free.

Declaration for Freedom Zones (Jaiv Panchayat)

Movement for

GMO-Free • Patent-Free • Debt-Free Suicide-Free Village

Thousands of our brothers and sisters have taken their lives because of the unbearable burden of costly and unreliable hybrid and GMO seeds.

Instead of regulating the biotechnology giants and protecting farmers, the government is attempting to stop farmers from saving their seeds through changes in the Patent Law and proposed Seed Act. This will lead to seed monopolies in the hands of MNCs.

The Government has also signed a new agreement with the U.S "the Knowledge Initiative in Agriculture" to promote the interests of the U.S Biotechnology industry. This will deepen the agrarian crisis and create national food insecurity and threaten our very survival.

We pledge to defend our livelihoods and food sovereignty. We pledge to make our agriculture GMO free and suicide free.

We pledge to defend our seed sovereignty and food freedom.

Village .....

District .....

State ..... **Date** .....

Village .....

District .....

State ..... **Date** .....

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APPENDIX

Farmers Suicides in Andhra Pradesh

During the past seven or eight years, the peasants of Andhra Pradesh (AP), known for militant agrarian struggles before and after independence, their hard work and enterprising skills, have committed suicides in the thousands. Apart from the general factors that are responsible for this phenomenon across India, there must be some additional factors that led to this alarming and disturbing situation in AP.

Actually, the phenomenon of suicides in AP dates back to 1987-88, when desperate cotton growers took their lives in Guntur and Prakasam districts. There was a boom in cotton cultivation in the early 1980s, bringing good profits to the farmers. The farmers called cotton "white gold". But from mid-1980s onwards, the cotton farmers suffered heavy losses due to crop failure. However, the area under cotton cultivation continued to grow in the State, as it expanded to other regions, especially Telangana region of the State. Again in 1997-98, a large number of farmers who cultivated cotton, chillies and groundnut committed suicides. Thereafter, it became a permanent phenomenon in the State with suicides taking place every year, with some variation in the number. (Rao and Suri 2006). According to government estimate, AP reported about 1835 suicides since 2001 (Hindu 2006, Business Line 2006).

The farmers have little control over the market and prices or in shaping the import and export tariffs, which are directly responsible for the distress of growers of crops such as cotton and groundnut. As this happened year after year, the debt had increased to such an extent that it was virtually impossible for most farmers to repay. Going by the standards of an ordinary government employee or a petty trader in urban areas, the amount may not be very big, but it is something that the farmer cannot repay even after selling his entire crop in a year or even by selling his entire assets in some cases.

The cost of production of paddy in Andhra Pradesh is higher by about 16 percent when compared to the cost in Punjab. The cost of growing cotton is higher by more than one-third when compared to that in Gujarat and the cost

Rao, P.N. and K.C. Suri 2006, "Dimension of Agrarian Distress in Andhra Pradesh" Economic and Political Weekly, April 22-28, 2006, Bombay.

Hindu 2006, "Package to Prevent Suicides", The Hindu 11 April, 2006, New Delhi

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of groundnut is 38 percent higher in the State when compared that in Gujarat. (Sridhar 2004) The higher cost of cultivation in the State could be mainly attributed to the high cost of inputs. Among all the states in India, AP stands at the top in terms of the consumption of pesticides per unit of output and second highest, next to Punjab, in the consumption of fertilizers. The prices of pesticides and chemical fertilizers had increased several fold over the past 10 years. Purchase of seeds was most common in AP and highest among the Indian states. Eighty-one per cent of farmer households purchase seeds compared to forty eight per cent for India. Fifty-one per cent of the farmers in the State, again the highest for any State in the country, replace seed varieties every year.

Usually, the minimum support price (MSP) announced by Government is less than the market price (Table 1). Keeping in view the constantly rising cost of production, every year, the Government of AP has been recommending a highest MSP for most crops, but the Union Government cares very little for such recommendation. For instance, for the kharif crop of 2004, the Government of AP wanted the MSP of cotton (medium staple) to be at Rs 2700 a quintal, while the Union Government fixed it at Rs 1760; the figures for the groundnut crop are Rs 2,260 and Rs 1500.

TABLE 1
Minimum Support Price and Market Price for Major Agriculture Commodities, Andhra Pradesh

Year	*Paddy*		*Cotton*		*Chillies*	*Groundnut*	
	Minimum Support Price (Rs per Quintal)	*Market Price (Rs. Per Quintal)*	*Minimum Support Price (Rs per Quintal)*	*Market Price (Rs. Per Quintal)*	*Market Price (Rs. Per Quintal)*	*Minimum Support Price (Rs per Quintal)*	*Market Price (Rs. Per Quintal)*
1997-98	415	559	1330/1530	1841	3113	980	1201
1998-99	440	598	1440/1650	2082	3986	1040	1305
1999-2000	490	875	1575/1775	1732	3534	1155	1341
2000-01	510	662	1625/1825	1852	2941	1220	1366
2001-02	530	749	1675/1875	1805	2895	1340	1367
2002-03	550	827	1695/1895	1836	3233	1355	1455
2003-04	550	—	1725/1925	1964	2441	1400	1791

(Rao & Suri 2006)

The 59th round of the NSSO survey on farmers' condition reveals the distressing picture in AP. First, the incidence of indebtedness among farmers is the highest in the State. About 82 per cent of the farmer households are indebted. The proportion of indebted households is more or less same among all social groups. Secondly, the debt liability-asset value ratio is the highest in AP. According to the survey it was 7.14 for AP, while it was 1.62 for Haryana,

Sridhar, V. 2004, "An Agrarian Tragedy" Frontline, July 15-30, 2004, Chennai.

N.S.S.O. 2005, "National Sample Survey Organisation" Some Aspects of Farming, 59th Round, Ministry of Statistics and Programme Implementation, Govt. of India, New Delhi.

1.72 for Punjab, 2.71 for Gujarat, 3.55 for Kerala, 3.71 for Karnataka and 4.48 for Tamil Nadu. The asset value of farmer households in AP (Rs. 1.35 lakh) was much less than the all-India average (Rs. 3.73 lakh). On an average each farmer household in the State had an outstanding debt of Rs 23965. When compared to other states, AP had the lowest share of agriculture spending in total plan expenditure. While the expenditure on agriculture to total expenditure is around 7 per cent in Karnataka and 5 per cent at the all-India level, it was only around 3 per cent in AP.

Table 2 shows the profiles of two villages Nandenlla and Karalapadu in Guntur district. In Nandendla village farmers had a debt from Rs. 15000 to Rs. 1,37,750 and in Karalapadu the debt is Rs. 17541 to Rs. 25000. If we include land rent in cultivation costs, both paddy and cotton show negative returns; chillies and pulses gave marginal returns (Table 3).

In Nadendla, the farmer who committed suicide owned four and half acres of land and had leased in another 10 acres. He cultivated both cotton and chilly crops. He ended his life due to crop failure and the fear of inability to pay the accumulated debt. In Karalapadu, the farmer who committed suicide owned one and half acres of land. He had leased in another four acres of land. He cultivated both cotton and paddy. He too ended his life due to recurrent crop failures and the fear of inability to repay the debt.

The puzzle, however, is that while agriculture has become unremunerative why are tenants willing to take land on lease and cultivate? Probably, the marginal and small farm households, in the absence of alternative employment, choose to cultivate crops on leased lands instead of working as agricultural labourers in other farms or they hope to gain in the event of a good crop and high output prices.

TABLE 2
Economics of Cultivation in Nandendla and Karalapadu Villages, Guntur (AP)

Village	***Per Acre Net Profit/Loss (in Rs)***			
Nandendla	**Below 2.5**	**2.5 to 5.0**	**5 to 10**	**Above 10**
Per acre debt	6225	16015	12542	9695
Per farmer debt	15000	69615	104800	137750
Average farm size (operated)	2.25	4.15	8.15	14.30
Karalapadu				
Per acre debt	17541	13654	12814	11250
Per farmer debt	27916	53100	98235	250000
Average farm size (operated)	1.66	4.04	7.88	25.00

(Rao and Suri 2006)

Rao, P.N. and K.C. Suri 2006, "Dimension of Agrarian Distress in Andhra Pradesh" Economic and Political Weekly, April 22-28, 2006, Bombay.

TABLE 3

Cost of Cultivation in the Sample Villages

Particulars	***Paddy***	***Chillies***	***Cotton***
Total Cost (Rs.)	13500	27200	19800
Price per quintal	650	2100	1750
Yield in quintals	18	14	10
Gross income	11700	29400	17500
Net Income (Rs.)	–1800	2200	–2300

(Rao and Suri 2006)

The summer of 2004 was an unprecedented one for rural Andhra Pradesh, even by the dubious standards established in the last two decades when the number of suicides by peasants had risen alarmingly. As shown by table 4 in a short span of less than two months, between May and July 2004, more than 400 peasants in the State committed suicide. (Sridhar 2006)

TABLE 4

Suicides by Peasants in Andhra Pradesh, May 14 - July 9, 2004

District/Region	***Suicides***
Coastal Andhra	**121**
Nellore	21
Prakasam	13
Guntur	36
Krishna	18
West Godavari	15
East Godavari	11
Visakhapatnam	3
Vizianagaram	2
Srikakulam	2
Rayalseema	85
Chittoor	18
Cuddapah	14
Anantapur	30
Kurnool	23
Telangana	222
Mahbubnagar	27
Rangareddy	10
Nizamabad	28
Nalgonda	31
Medak	32
Adilabad	13
Karimnagar	37
Warangal	27
Khammam	17
Total	428

(Sridhar 2006)

Sridhar, V. 2006, "Why Do Farmers Commit Suicides. The Case of Andhra Pradesh." Economic and Political Weekly, April 22-28, 2006, Bombay.

The single most striking feature of the last round of suicides was the fact that they were not concentrated in a pocket of the State as on previous occasions. Anantapur district, which is possibly best designated as the "suicide capital" of India, used to be better known until the last round of deaths. It has been estimated that more than 450 peasants in the district have committed suicide since 2000.

Anatomy of a suicide

Sarita's husband, M Mahendra Reddy, drank monocrotophos on May 24, 2004. He owned 1.2 hectare (ha) and taken another 2.4 ha on a two-year lease at Rs. 12,500 per ha. He dug two borewells deeper than 75 metre in his fields in Kondapur village of Chiyurumamidi mandal, Karimnagar district. The second well, which he shared with his brother, yielded some water. Sarita's father says Mahendra spent up to Rs. 40,000 on pesticides. "He would have grown paddy, but water was inadequate. So he grew cotton," says Sarita's brother. He had also borrowed Rs. 1,00,000 for a poultry business that failed, Rs. 60,000 from a friend's wife and another Rs. 25,000 from Radhakrishna Finance, a company in Husnabad, at a rate of 36 per cent interest per year. He was hoping for a good return on his cotton crop – about Rs. 2,50,000. The crop failed due to pest attacks, low quality seeds and unfavourable weather. Sarita remembers him mentioning he couldn't control the pests. On May 12, a creditor called a meeting in the village and publicly humiliated Reddy for not paying loans. On May 15, Reddy went to work as a labour supervisor in Mahboobnagar district, but returned on May 22. He sold his wife's jewellery to repay Radhakrishna Finance. Two days later he killed himself, leaving behind Sarita and a two-year-old daughter and Sarita is pregnant. (Joshi 2004)

Like a Vice

Adinarayana, a 55-year-old tenant farmer, drank pesticide and died on May 20, 2004 in his village Bokkaraya Samudram, Anantapur district. His creditors were harassing him to return the Rs. 1,50,000 he owed them. Adinarayana had leased 2 hectares (ha) from two farmers for Rs. 15,000 per hectare, but the borewell failed. Adinarayana had to borrow from private moneylenders because Banks don't give crop loans without land deeds.

The creditors want Adinarayana's wife, Laxmi Devi, to transfer the loan to her two sons. Adinarayana had taken half of the loan from Waridhi, his sister's husband and a moneylender, against the deed of their house. Waridhi owns about six ha of irrigated land, which his three bothers cultivate. He works as a daily wage porter in the municipal market, cooks at weddings and gives money on interest. His three sons are masons. Waridhi wants to know if government will give any relief to Adinarayana's family, and whether Waridhi will get his loan back. The Mandal Revenue Officer who probed Adinarayana's death says he had actually sold his house to Waridhi, who has told the family to pay up within six months, or get out. Right now, Adinarayana's sons are working as daily wagers to earn enough to eat. (Joshi, 2004)

Joshi, Sopan 2004, "Inevitable Tragedy" Down To Earth, July 15, 2004, Centre for Science and Environment, New Delhi.

Over the past 10-15 years the State has stepped back from its role as a promoter of agriculture. Significantly, the State has not only vacated the space that truly belongs to it as the custodian of the poor and marginal farmers, but actively facilitated the entry of the landed gentry to occupy this vital space. This is felt in every aspect of the agricultural sector in Andhra Pradesh today.

Although the feature of a full-blown agrarian crisis was already evident, the department of agriculture in Andhra Pradesh issued a white paper in 1999 stating that the Government could act only as a facilitator. It said that no public investment would be forthcoming to provide for these essential services. It pointed out that it would not fill up the more than one-fourth of the sanctioned posts that were vacant, claiming that the government did not have "resources to employ any more extension workers." Instead, the department proposed to wind up the entire cadre of agricultural extension officers. It envisaged that extension services would be promoted through the private sector, by taking either the unemployed or retired employees. The burden on the AP Seed Corporation would be reduced by making the private sector more accountable through appropriate memorandum of understanding (MoU). The hiring of agricultural machinery would be encouraged through the corporate sector, NGOs and others. Soil survey, soil conservation and collection of market information were to be encouraged to be developed in private sector with appropriate policy incentives.

It was but natural that in keeping with this view of the State Government, a number of public institutions catering to the needs of the agricultural sector were either undermined or completely closed down. The Government corporations or co-operative institutions, such as the Andhra Pradesh Irrigation Development Corporation, Agro-Industries Corporation, Seeds Development Corporation, Cooperative Sugar Factories, and Cooperative Spinning Mills which were envisaged to help farmers, were closed down, or allowed to degenerate or handed over to the private sector.

The burden of the agrarian crisis has obviously fallen on the small and marginal farmers. More than 80 percent of the land holdings are of the size two hectares and constitute 43 percent of the cultivated area.

Moreover, tenant cultivators with little or no land, pay exorbitant rents to landlords. High rents charged by absentee landlords in coastal Andhra Pradesh, amounting to more than half the annual produce of the farmer, are a serious burden on the peasantry. The rising cost of cultivation, coupled with the risks associated with it, has not only added to the burden on the peasantry but made life uncertain for the poor peasant. The tenants plight is worse because, apart from the rack-renting by landlords, he is also totally outside the loop of the formal credit mechanism.

In the Krishna and Godavari delta area of coastal Andhra Pradesh where tenancy is as high as 60-80 per cent of the cultivated area, rents take away more than half of the farmer's produce.

Infact the condition of wage labourers is better than the farmers, because a wage labourer takes away his wage in cash, whether high or low. He or she is not vulnerable to the consequences of crop losses or the volatility of market prices of the agricultural produce. True, he does not claim a greater share in case the farmers get a profit, but nor does he need to share the loss. As crop

losses and low prices had hit the farmers repeatedly, their households are subjected to serve hardships. It is not that the condition of agricultural wage labourers is any better, but degradation and pauperization are the special characteristics of farmers. The dilemma of the farmer is that he cannot transform himself into a wage labourer, nor is he happy with cultivation. No wonder that 40 per cent of farmers of India reported a dislike for farming.

It is a paradox that most of the political representatives come from agricultural background but little is done for farmers' welfare. The space for farmers in the policy process is shrinking, as they are least organized and can hardly lobby with lawmakers. For the last 10-15 years we have not seen any vibrant agrarian movements in the country. Political parties seem to be little interested in organizing and mobilizing farmers. The disunity among farmers and their inability to pool resources to conduct any sustained agitations make the political parties take them for granted. Over the years the role and importance of traders in agricultural produce, contractors and commission agents have been growing in every state.

Grim Reaping

His son Babu found him dead in the cowshed behind their home. Kusara Mallagaud had drunk pesticide the night earlier, and quietly lay down for the last time in the shed where no one could hear him as he writhed in pain, alone in his last hours. He clearly wanted to die the way he had tried to live his life, enduring his suffering himself, trying always to shield his family. But in the end he abandoned them, succumbing to the deadly epidemic that has stalked rural India during recent years.

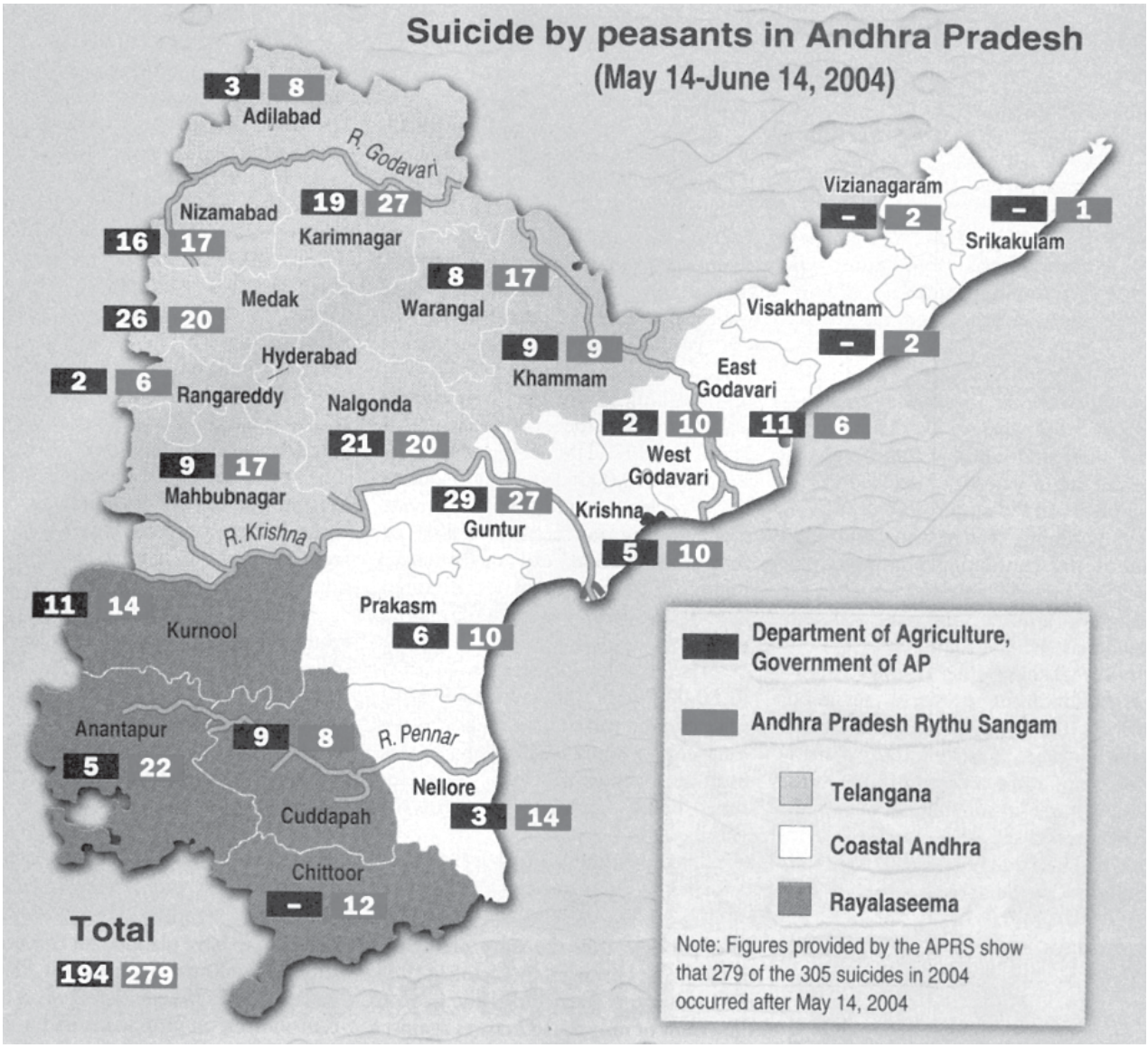
A month before he died, Kusara spoke to his son about the hopeless enormity of his debts. Three lakh rupees. He furtively hid from the moneylender, and in so doing felt deep shame. But for how long could he avoid him?

Kusara took a loan from the village moneylender to dig a borewell three years earlier. It was dry. Desperately he took more loans. Four more borewells failed, as the water table in the village fell dangerously low.

The moneylender does not need to use brute force to reclaim his loans. It is enough to stand in the village square and shame his debtors by talking of their unpaid loans. This humiliation drives peasants — proud, stoic, immersed in traditional values of trust and honesty to desperately sell all they own, from land, jewellery, cattle to their homes to repay their debts. Or else escape the shame, by taking their own lives.

In a recent national opinion poll, many observers were surprised when an overwhelming majority of respondents, both rural and urban, said that nothing shamed and pained them, not corruption, not violence, not crime, as much as the suicide of farmers. It was unsuspected depths of public anger at the suicide of farmers that drove away the former government of Andhra Pradesh, which was considered a shining model of good governance by supporters of globalisation. (Mander 2006)

Mander, Harsh 2006, "Grim Reaping" Grassroots, Vol. 7, No. 5, May 2006, New Delhi.



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