

PROMOTION OF NEW FORMS OF FINANCING FOR TRANSFER, DEVELOPMENT, AND APPLICATION OF ENVIRONMENTALLY SOUND TECHNOLOGIES

by

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1. Introduction

Nepal is endowed with a wide geo-ecological diversities and its topography ranges between 305 metres and 8848 metres high stretching from plain Terai Valleys, hills and mountains. This wide-ranging topographical variation has blessed us with unique climate and biological diversities, which can provide us a platitude of agro-diversity and forest resources.

HMG Nepal has given priority to develop agriculture and forestry sector not merely as a source of enhancing livelihood of the rural people but also to reduce poverty in the stipulated time frame. The ninth plan has emphasized this aspect and the utilization of agro-forestry resources will be expedited to develop agro and forest based industries which can provide employment to large segment of the population. The sustainable development of road infrastructure also requires a balanced approach for eco-fragile chure ranges where devastation by landslide can become a big menace unless integrated road construction with bio-engineering along the corridors of road are undertaken.

Nepal is a small country with an areas of 147,181 sq.km. The population is 22.9 millions. The GNP per capita is \$210. The agricultural GDP is 40 per cent as compared to 60 per cent GDP in non-agriculture sector (Table 1). The last ten years has witnessed a decline in agricultural GDP, with 47.68 per cent in 1990-1999 and 40.12 per cent in 1999-2000. The manufacturing sector has made modest increment in terms of GDP from 6.80 per cent in 1990 to 9.47 per cent in 1999-2000 (Table 2). Though the increment is small, the manufacturing sector has grown to provide employment to the people, and eventually become an important sector of the economy.

Table 1: Brief Sketch of Nepal

Area	147,181 sq. km
Altitude	(305-8848) metres
Population	22.9 million
GNP per Capita	US \$210
Agricultural GDP	40.12%
Non-Agricultural GDP	59.88%

Table 2: Gross Domestic Product by Industry Group (Based on Current Price) in Percentage

Sectors	1990-1991	1995-1996	1999-2000
1. Agroculture Fisheries and Forestry	47.68	40.48	40.12
2. Mining and Quarring	0.50	0.56	0.47
3. Manufacturing	6.80	9.38	9.47
4. Electricity, Gas Water	0.70	1.50	1.71
5. Construction	9.54	10.90	9.46
6. Trade, Resturants and Hotels	11.11	11.83	11.84
7. Transpoart, Communication	5.65	6.64	7.63
8. Financial & Real Estate	9.42	9.83	10.04
9. Community & Social Service	8.60	8.88	9.26
GDP at Factor Cost	100.00	100.00	100.00
Agricuture	47.68	40.48	40.12
Non-Agricuture	52.32	59.52	59.88

The technologies used by majority of the industries are traditional, and these enterprises require, nurturing in terms of upgrading environmentally sound technologies (ESTs).

2. Environment and Natural Resource Management

The environmental problems in the country are already at the verge of initiating some intervention efforts. These environment related hazards such as landslides, land erosion, flood, loss in agricultural productivity and deforestation in the rural areas are in the increasing trend whereas smoke, dust, and garbage, are likewise increased in the cities. The ninth plan has endeavoured to establish harmony between environment and development. The successful implementation of community forestry management projects by active participation of the people has shown encouraging results of how forest can be protected by people themselves for their own sake.

On the whole, it is encouraging to note that people's awareness about environment has increased, and this is the beginning to address the gigantic

task of environment protection. Government has mandated Environmental Impact Assessment (EIA) for infrastructural projects, industrial establishments and other related projects.

2.1 Objectives of the Ninth Plan (Environment)

- to coordinate all related sections of the various ministries for consolidating working system and planning for maintaining environmental balance and development of the country,
- to coordinate all related agencies involved in environment protection
- to enforce population control measures by fixing emissions and effluent standards,
- to develop legal framework for mobilization of private sector and non-governmental agencies effectively in environmental public health and garbage management,
- to enhance national capability in disaster control and management by trained manpower in the field of environment.

2.2 Policy and Implementation Strategy

- Participatory programmes will be encouraged involving women and underprivileged people in the execution of environment programmes.
- Public awareness regarding environment and EIA activities will be launched with the voluntary initiatives of local bodies, government, and non-government and private sector.
- Indigenous technology will be promoted to keep pace with environment protection based on traditional and cultural values.
- The EIA will be implemented in view of linking economic development with environment protection.
- Environmental management plan will be executed by determining emission, and effluent standard of air and water, originating from industrial plants,
- Government, non-government, and international institutions will be encouraged to invest projects relating to environment protection, management and education.
- All necessary measures will be made use to identify and protect forest and wetland areas, and plant and animal genetic resources.
- Efforts will be made to accommodate favourable financial and economic policy, measures reviewing the tax, custom, and investment policy as per requirement of environment protection
- All relevant acts and regulations relating to environment issues will be

- formulated keeping in pace with the timely reforms of existing legislation.
- All needed institutions will be established to implement environmental laws and policies effectively.

3. Industry Sector

The industries are categorized in terms of investment as follows:

Cottage Industries

The traditional industries which utilize specific skill, local know-how, and local resources. These industries are labour intensive. The cottage industries make use of tradition, art and culture.

Small Industries

Industries with a fixed asset of up to Rs. 30 million are categorized as "Small industries".

Medium Industries

Industries with a fixed asset between Rs. 30 million and Rs. 100 million are categorized as "Medium Industries".

Large Industries

Industries with a fixed asset of more than Rs. 100 million are categorized as "Large Industries".

Cottage industries

3.1 The cottage industries are further classified as such handlooms, pedallm, semi-automatic loom, warping, dyeing and printing, tailoring (other than ready made garments), knitting, handknitted woolen Carpet, Pasmina, Woolen garments, Carpentry, Woolen artistic product, cane and bamboo work, natural fibre products, handmade paper and goods, dhilgiree products including silver, brass, copper, precious and semi-precious stones, garments, sculptures and pottery, honey, chiuri, cardamom processing, clay or ceramic pottery, leather cutting and tanning, and leather goods, jute, swab grass, babio, choya, cotton thread products, artistic products (bones, horns, stone carving, ceramic fine arts, incense stick dhup, dolls and toys, etc), several traditional food industries with a fixed assets up to Rs. 2,00,000.

3.2 Several agro and forest based industries are as follows:

- Sericulture and silk production
- Horticulture and fruit processing
- Animal husbandry
- Dairy processing
- Poultry farming
- Fishery
- Tea gardening and processing
- Coffee farming and processing
- Horticulure and herb processing
- Vegetable farming and processing
- Tissue culture
- Bee keeping
- Honey production and processing
- Floriculture
- Cotton farming and processing.

The principal indicators of manufacturing establishments shows that carpets and rugs manufacturing provide employment to 54,670 people, followed by non-refractory clay and ceramic products (37,834 people). The agro and forest based industries are relatively smaller in terms of generating employment (Table 3).

Table 3: Principal Indicators of Manufacturing Establishments by Type and NSIC, 1996-1997

NSIC	NSIC Name	No. of of EST	No. of persons engaged	No. of employ- ment	Gross output	Value Address
1511	Meat & Meat Products	2				
1513	Fruit & Vegetable Products	2				
1514	Vegetable & Animal Oil and Fats	47	1859	1767	2918741	48998
1520	Dairy Products	26	1841	1760	1466197	567438
1531	Grain Mills Products	286	5082	4329	3633909	640981
1532	Strach & Starch Products	2				
1533	Animal Feeds	40	770	663	488054	136158
1541	Bakery products	113	2991	2619	593762	176460
1542	Sugar Products	30	6419	6343	1748040	642391
1543	Coco & Confectionary Products	26	415	363	69829	19700
1544	Noodles	17	656	613	415121	172343
1549	Food Products (NEC)	43	1898	1784	310926	127613

NSIC	NSIC Name	No. of of EST	No. of persons engaged	No. of employ- ment	Gross output	Value Address
1551	Distill, Rectify & Blending of Spirits	16	738	691	739806	594669
1553	Malt Liquors & Malt	4	698	694	1499931	1066487
1554	Suif Drinks & Mineral Water	7	544	535	622043	330949
1600	Tobacco Products	38	3213	3142	3665159	2624063
1711	Spinning & Weaning of Textiles	134	7442	7090	2177660	742610
1712	Finishing of Textiles	89	6883	6643	1645194	623032
1722	Carpets & Rugs	533	54670	52729	7745650	3890332
1810	Wearing Appare & Except Fur	136	15726	14848	3801673	1376123
2693	Non-refractory Clay Ceramic Products	475	37834	36804	1067361	630063

3.3 Industry Policy and Implementation Strategy

The Ninth Plan has envisioned the target for generating employment to 350,000 persons and, it is anticipated that the GDP contribution will have to achieve a target of 14 per cent the end of the ninth plan period.

- to diversify industrial production, by commercializing agriculture, forest and mine by linking industry sector with the economic sector.
- To encourage foreign investment in the area of competitive advantage
- to tune up the existing Labour Act, Contract Act, Company Act, and Foreign Exchange Act for ensuring the leading role of the private sector.
- to privatize government-owned industries, financial and research institutes.
- to promote cottage and small industries by providing technical and other necessary support.
- to expand capital base of domestic financial institutions by attracting capital inflows from foreign financial institutions.
- to create industrial village, technology park, and export processing zones for manufacturing high quality exportable goods.
- to develop skillful, and trained manpower in the private sector.
- to formulate anti-dumping, anti-trust/ monopoly acts and policies for assuring fair trade practices and protecting domestic industries from unfair competition.
- to enhance clear production technology for reducing negative impact of the industrialization of the environment.

3.4 Industrial Pollution Control Project

This project focuses on assessing effluent standard of those industries which discharge pollutants. Further, this project takes into account of EIA (Environment Impact Assessment). The EIA monitoring will be carried out in the industrial enterprises and pollution certificate will be issued as per provisions in pollution standard. The prima facie of this monitoring is to minimize negative effect on environment and to promote cleaner production of industrial enterprises.

4. Issues and Constraints

Though environmental and industrial policies are stated in the Ninth Plan document, and some necessary infrastructures are created, there is yet a long way to bridge the gap of improving environment and protecting consumers. Some relevant issues are mentioned here.

- Lack of awareness about ESTS amongst industries, consumers, and policy makers.
- Lack of R and D infrastructure for development adoption, and dissemination of ESTS particularly in the area of priority sector of the economy agriculture and agro-processing.
- Lack of planning, monitoring and evaluation of ESTS for selection and adoption of such technologies.
- Lack of coordination amongst private, public, NGO/INGOs, and academia to address environment issues.

5. Identification of ESTS

- Exploitation of wind energy.
- Biomass energy produced by the biological conversion or photosynthesis.
- Solar photovoltaics for electrification of rural communities.
- Rational use of geothermal energy.
- Small hydropower.
- Integrated Pest Management (IPM), technology for minimizing use of pesticide chemicals in agricultural farms.
- Improvement of indigenous agro-processing technologies.
- Development and promotion of ESTS agro-processing as a starting point for environment protection.
- Waste management.
- Industrial waste management.
- Household waste management.

- Solid waste disposal.
- Biosafety of GM Foods.
- Risk assessment.
- Environmental audit.
- Environmental accounting.
- Purification of dyes used in carpet industries.
- Information database.

6. Recommendations

The ESTS should be prioritized and brought into operation taking into cognizance of multi-sectorial nature of this mission. At present, some ground works have been laid down in the Ninth Plan document, and requirement of EIA as a precondition for large scale investment along with the establishment of Ministry of Environment and Population has definitely provided some basic frame to focus on environmental issues. However, some IPM initiatives are taken up by the Ministry of Agriculture and Cooperatives for minimizing use of chemicals in the food chain. But, yet this activity needs to be implemented nationwide to show visible impacts.

There are as many as 18,000 small scale enterprises in the food and beverages sector, providing employment to 75,000 people, gross output of Rs. 3,632 million. The food and beverage sector industry including small-medium and large scale industries together total 18,587 enterprises, provide employment to 76,969 people and gross output of Rs. 11,660 million. The small scale enterprises, by and large, make use of indigenous technology and know-how. The scope for technology refinement and improvement seem to be promising from the perspective of making it environmentally sound by way of adding some gadgets or modifying a little but to serve the purpose. R and D institutions should actively work in coordination and collaboration with private sector in such endeavors. Another promising area of such undertaking should embrace the use of safe packaging system for agro-food products in such a way that it does not cause any harm to the consumers. This is particularly important in the context of promoting foreign trade. All these activities require sustainable initiatives to enhance ESTS backed up by financial resources. Some of the key projects are recommended for financing of ESTS as follows:

6.1 Formulation and updating of legislations

Environment related laws and regulations such as Pesticides Act, Food Act,

Consumer Protection Act, Nepal Standard Act, Nepal Standard Act, Feed Act and EIA Policy, etc. will be reviewed and updated as per requirement of consumer protection as well as to smooten the trade practices.

6.2 Development of Regional Research and Developemnt (R&D) Network for ESTS with UNDP and ESCAP Fundng.

The proposed regional network will help to identify potential areas of ESTS for the member countreis and provide technical assistance and support. Similar in-country network should also be established by coordinating related institutions involving all the partners such as governemnt, NGO/INGO and academia.

6.3 Promotion and Disseimiantion of ESTS

ESTS are either developed or adapted as per need, and such technologies are disseminated through existing extension units. The area of ESTS are identified by involving related agencies, industries and law enforcing authorities. The monitoring and evaluation of the performance of such activities are carried out by both the Regional Network and Country flFocal Points. Every penny of investment made in the ESTS promotion shold be recovered in terms of improving healthy environemnt in the project site.

6.4 Management of waste (industrial and household) and solid waste disposal

This is a very important proeject because the urbanization process has cost the freshness of air, water, and overall environment of the locality. The waste should be treated from two aspects: 1) to utilize it as a manure for agricultural production particularly with degradable substances, and (2) to treat those wastes which may not be suitable for manuring purposes.

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