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Potentials of Date Palm Tree to the Nigerian Economy

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Abstract: Date palm tree is an economic crop which is grown in the arid region of Northern Nigeria from latitude 10° N in the Sudan savannah and the Sahel regions. Its role in food production, foreign exchange earnings, raw materials for industries, income and employment generation makes it a crucial asset for National Economic Development. It was observed that Nigeria is not yet listed among the Date producing nations in West Africa and the world. The aim of this paper was to reveal the potentials of date palm tree to the nation's economy. In West Africa Niger was the highest Date producer with total production of 37794MT, in 2009. In Africa Egypt was the highest with 1,350,000MT and world highest producers, followed by Iran with 1,088,040MT and Saudi Arabia with 1,052,400MT all in 2009. Findings also revealed a significant increase in the level of production over the years, indicating a very bright market prospect at the international scene. For Nigeria to reach its full potential, the commercial development of Date products are imperative. Government should establish a Date palm settlement scheme and provide policy that is private sector engineered to increase productivity in all chains of date palm production.

Key words: Significant increase · Imperative · Productivity

INTRODUCTION

Date palm (*Phoenix dactylifera* L.) is one of the oldest cultivated plants [2], it is also one of the oldest cultivated crop grown in the desert and semi-desert area, extending from North- West Africa and Asia principally between 15°N and 30°N. Date palm is a multi-purpose tree, being highly regarded as a national heritage in many countries. It provides food, shelter, timber products and all parts of the palm can be used Because of these qualities and it is tolerant to harsh environmental desert conditions. Dates are produced in hot arid regions of the world and marketed worldwide as a high value confectionery. It is considered as an important subsistence crop in most of the world's desert areas. A date palm is a tall tree that produces a sweet fruit known as a date. It normally reaches a height of 49.2 to 82 feet (15 to 25 m). This tree typically has feathery leaves at the top which may be anywhere from 0.9 to 1.5 feet (3 to 5 m) in length. The trunk is usually very long and narrow with rough-textured bark over most of its surface. There are no branches on a date palm tree. The leaves normally cascade downward from the crown of the plant to form a sort of canopy. They might spread anywhere from 19.7 to 32.8 feet (6 to 10 m) in diameter. This can often provide some shade for a person to sit in or for other small plants to grow in. This tree is believed to have originated in Africa or Asia [2]. Ancient seeds of this plant have been found in what is modern-day Iraq. Although its origins are in the Middle East, it now also grows in Mexico, Chile, India, Italy, Spain and the south-western United States. A desert environment is typically ideal for a date palm tree to grow in [2]. It normally does especially well in an oasis setting because there is often an ample supply of water for the roots to soak up. The tree can usually withstand hot temperatures and generally does not wither when placed in direct sunlight. The fruit of a date palm tree generally grows on long strands near the top of the tree. These dates may also grow in clusters like that of grapes. They are usually oval-shaped and around 1 1/2 inches (3.8 cm) in length. They could be medium to dark brown in colour and might also have a reddish hue. The skin of this fruit is typically very thick and wrinkled with a shiny appearance to it. Dates usually have a very sweet taste when eaten fresh. Even so, they are often dried as a method of preserving and for snacking. They are a

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common ingredient in many Middle Eastern dishes and might also be used in making desserts. A date palm can take anywhere from four to seven years to start bearing dates, with peak crop production normally beginning after 10 years. Its fruit must usually be harvested several times during the year to allow room for new crops to grow. This is a hardy tree generally grown commercially rather than in residential settings. Date palm is believed to have been introduced into Nigeria in the early 8th century by Arab traders from North Africa. Date fruits are a highly valued delicacy among many communities in Nigeria, especially during ceremonies and festivals [3]. The Date palm tree can be grown extensively and commercially in the arid region of northern Nigeria from latitude 10°N in the Sudan savannah and the Sahel regions. This includes Kaduna, Kastina, Kano, Sokoto, Kebbi, Zamfara, Jigawa, Yobe, Borno, Gombe and Bauchi State. The Nigerian Date palm industry has the potentials of enhancing rapid economic growth and development if adequately exploited. The Date fruit contains over 3000 calories/kg, which makes it a high energy food. The Date palm has been in cultivation for over 400 years in Nigeria; however no information is available on the production capacity as well as its cost and returns structure in the country [4]. This is due to the facts that annul date production statistics in the country remain unknown and has made Nigeria unrecognized among the date producers in the international scene. So far the Nigerian Institute for Oil Palm Research has carried out studies on annual date production level in some states in the country, which will provide information for research planning, growth and development of the industry.

Research of Date Palm in NIFOR: Date palm research in Nigeria has a long history dating back to the 1930s; with the mandate given to the Nigerian Institute for Oil Palm Research by the Nigerian institute Act No. 33 of 1964 major research efforts began in the early 1980s when prospection's / diseases survey studies were undertaken by breeders, crop protectionist, soil scientist and agricultural economist to some northern states. Significant progress has been made in the area of breeding, soil chemistry, agronomy and nutrition as well as crop protection [5]. The research sub-station in Dutse, Jigawa State has provided seedlings for famers at subsidised rate in order to encourage large plantations, provide job employment and create an output for local consumption and export, contributing to the nation's Gross Domestic Product (GDP).

Methodology: This work comprises of review of literature on date palm tree. Information were gotten from the Nigerian Institute for Oil Palm Research (NIFOR) annual reports, NIFOR In-house Research review [5] Articles and Journals, Conference papers, FAO statistics from the internet.

Encouraging Date Palm Production in Nigeria: The North has 79.1 percent of cultivable land in Nigeria. Nigeria has a great potential to expand its date palm output, increase productivity, become a net exporter of date fruit. The date palm industry has not been able to fully perform its expected role in Nigeria which includes supplying raw materials to the industrial sector, providing employment, generating foreign exchange and ensuring food security as well as economic growth of the nation. The crop has a lot of export potentials. In Nigeria a female date palm produces 10-75kg of fruits per annum at full maturity. This quality of fruits is capable of netting ₦2,000 - ₦6,000 depending on the quality of the fruits, this gives ₦30,000-₦90,000 per hectare per annum [5]. At present the economic activity in date palm industry revolves around fruit production and sale. From a simplified project profile of a hectare date plantation, a net return of N1.54 million can be obtained in the 3rd year of harvesting- i.e. 6 years after planting. Net revenue increases to ₦2.41 million in the 9th year. [6] This could be achieved with adequate participation of the government and private sector to exploit its potentials such as abundant land resources, bright market prospects and favourable climatic conditions. Thus establishment of a date palm farm settlement scheme is required to accelerate the growth and development of the industry. Also statistical records of post harvest loss of date fruits in Nigeria is not available, the heaps of wasted fruits in market places within the growing areas during peak seasons are indication of high losses due to poor storage of the fruits. In order to encourage the cultivation of date palm in the semi arid ecology to which it is adaptable, it became necessary to add value to these poor quality date fruits so as to increase the revenue potential of date palm farmers. Some of the date palm fruits in Nigeria have been characterized for their physical and chemical properties and technology for fruit packaging has also been developed [5]. In some parts of northern Nigeria and even some parts of the South, date fruits are sold without proper packaging. Various containers such as cigaret cups, small baskets etc., are used to sell the fruits to final consumers who only buy small quantities for immediate

consumption-usually untreated. NIFOR has developed a new technology for packaging date fruits. The fruit are first sorted and graded. Damaged fruits are sold immediately for direct consumption by man or animal. Fruits with calyx are then treated with potassium sorbate and dried at 45°C. Therefore, they are packaged in small lots of 100 grammes of fruits in labelled thick square polythene sachets. This technology removes problems of handing large quantities of date fruits, checks incidences of pests and diseases, preserves the nutritional value and increases the storage life of the fruits while at the same time generating employment for those who are employed to bag the fruits. This technology is therefore recommended to date fruit marketers in Nigeria [6]. Date fruit contains more than 70% sugar mainly glucose and fructose and therefore a ready source of energy. Date fruit is applied in the production of vinegar, ethanol, protein yeast, syrup and liquid sugar. The clarification of date juice in liquid sugar production is considered one of the major problems in the industry due to development of haze [7]. Three known processes are applied: clarification by enzymes such as rapidase, celluclast and amylase [7], the second is chemical processing where lime is mainly used in liquid sugar production [8], the third is a physical process which involves foaming and fractionation techniques [9]. Date fruit on like some fruits such as citrus, berries, grapes, etc. From which juices are obtained by direct application of pressure has to be hydrated, crushed and extracted by with water as shown : Date fruit-Washing-Steaming - Disintegration and Juice extraction - Lime clarification - Re-inforcement with Organic acid - Packaging & pasteurization - Packaged date fruit juice. This technology should be made available to investors interested in the production of non-alcoholic drinks. When date fruits are harvested some fruits are undamaged (first quality fruits) and some fruits are damaged (second quality fruits) by insects and rodent. The undamaged fruits are attractively packed and sold whereas the damaged fruits because of their lack of consumer appeal are converted into date fruit derived products such as date drink, date jam, date wine, date syrup etc. These secondary products add a lot of value to the fruits in terms of higher economic returns and product line extension.

Regional and World Production Level of Date: Production of date palm in Nigeria as earlier mentioned has not yet been determined due to the non availability of annual date production statistic in the country. But information on date production levels in nine states in the country is available. These are Bauchi 6000MT, Adamawa 600MT, Borno 1000MT, Gombe 1500MT, Jigawa 5000MT, Kano 6000MT, Plateau 100MT, Taraba 200MT and Yobe 2000MT [5] six states remain. In West Africa FAO statistic shows that Niger is the highest date producer with total production of 37794MT, followed by Mauritania 20000MT and Chad 18780MT. This shows that total annual production for 2009 was 76574MT compared to 2000 which was 40000MT. In Africa Egypt is the highest Date producer with 1350000MT, followed by Algeria 600696MT, Sudan 339300MT, Tunisia 145000MT, Libya 160101MT and Morocco 72000MT. The list also includes West Africa and a total annual production of 2618687MT, [10]. World Date production shows an increase from 6415317MT, in 2000 to 2743671 in 2009. Egypt remains the highest date producers in the world with Iran 1088040MT, Saudi Arabia 1052400MT, Pakistan 735276MT, United Arab Emirate 759000MT, [10]. Date products are increasingly traded internationally; major date fruit importers are European Countries and also other countries such as Japan which is fast becoming a date importer. Worldwide, date production has increased exponentially over the last three decades from 1.8 million tonnes in 1963, to 2.6 millions in 1983 and 6.7 million in 2003. This increase of 4.9 million tonnes since 1963 represents an annual expansion of about 6.8%. In 2001 the top five producing countries - Egypt, Iran, Saudi Arabia, Pakistan and Iraq [11] were responsible for 69% of total world production. If the next five most important countries (Algeria, United Arab Emirates, Sudan, Oman and Morocco) are included, then this percentage rises to 90%. This clearly indicates that most of the world's date production is concentrated in a few countries in the same region [12].

Nutritional Value of Date: Wonderfully delicious, dates are one of the most popular fruits with an impressive list of essential nutrients, vitamins and minerals, required for normal growth, development and overall well-being. Fresh date is made of soft, easily digestible flesh with simple sugars like fructose and dextrose that when eaten replenishes energy and revitalizes the body instantly; thus, for these qualities, dates are being used to breakfast during Ramadan months (nutrition-and-you.com/dates.html). The fruit is rich in dietary fiber, which prevents dietary LDL cholesterol absorption in the gut. It is also a good bulk laxative. The fiber content helps to protect the colon mucous membrane by decreasing exposure time and as well as binding to cancer causing

chemicals in the colon. They contain many health benefitting flavonoid polyphenolic antioxidants known as tannins. Tannins are known to have anti-infective, anti-inflammatory and anti-hemorrhagic (prevent easy bleeding tendencies) properties. They are a good source of Vitamin-A (contains 149 IU per 100 g), which is known to have antioxidant properties and is essential for vision. Vitamin A also required maintaining healthy mucus membranes and skin. Consumption of natural fruits rich in vitamin A is known to help to protect from lung and oral cavity cancers. The fruit is very rich in antioxidant flavonoids such as beta-carotene, lutein and zeaxanthin. These antioxidants have the ability to help protect cells and other structures in the body from oxygen free radicals and thereby found to be protective against colon, prostate, breast, endometrial, lung and pancreatic cancers. Zeaxanthin, an important dietary carotenoid selectively absorbed into the retinal macula lutea where it is thought to provide antioxidant and protective light-filtering functions; thus it offers protection against age related macular degeneration, especially in elderly populations. Dates are an excellent source of iron**,** contains 0.90 mg/100 g of fruits (about 11% of RDI). Iron, being a component of hemoglobin inside the red blood cells, determines the oxygen carrying capacity of the blood. In addition, they are good in potassium. Potassium is an important component of cell and body fluids that help controlling heart rate and blood pressure; thus offers protection against stroke and coronary heart diseases. They are also rich in minerals like calcium, manganese, copper and magnesium. Calcium is an important mineral that is an essential constituent of bone and teeth and required by the body for muscle contraction, blood clotting and nerve impulse conduction. Manganese is used by the body as a co-factor for the antioxidant enzyme, superoxide dismutase. Copper is required in the production of red blood cells. Magnesium is essential for bone growth. Further, the fruit has adequate levels of B-complex group of vitamins as well as vitamin K. It contains very good amounts of pyridoxine (vitamin B-6), niacin, pantothenic acid and riboflavin. These vitamins are acting as cofactors help body metabolize carbohydrates, protein and fats. Vitamin K is essential for many coagulant factors

Medicinal Properties of Date: Dates have a high tannin content and are used medicinally as a detersive (having cleansing power) and astringent in intestinal troubles [13]. As an infusion, decoction, syrup, or paste, dates may be administered for sore throat, colds, bronchial catarrh and taken to relieve fever and a number of other complaints. One traditional belief is that it can counteract alcohol intoxication. The seed powder is also used in some traditional medicines. A gum that exudes from the wounded trunk is employed in India for treating diarrhea and genito-urinary ailments. The roots are used against toothache. The pollen yields an estrogenic principle, estrone and has a gonadotropic effect on young rats [13].

Food Uses of Date: Date fruits are used as snacks in Nigeria and low quality fruits are used in feeding animals. In northern Nigeria, dates and peppers added to the native beer are believed to make it less intoxicating [14]. According to Morton, J, dry or soft dates are eaten out-of-hand, or may be seeded and stuffed, or chopped and used in a great variety of ways: on cereal, in pudding, bread, cakes, cookies, ice cream, or candy bars. The pitting may be done in factories either by crushing and sieving the fruits or, with more sophistication, by piercing the seed out, leaving the fruit whole. The calyces may be mechanically removed also. Surplus dates are made into cubes, paste, spread, powder (date sugar), jam, jelly, juice, sirup, vinegar or alcohol. Decolored and filtered date juice yields clear invert sugar solutions. Libya is the leading producer of date sirup and alcohol [14]. Cull fruits are dehydrated, ground and mixed with grain to form a very nutritious stockfeed. Dried dates are fed to camels, horses and dogs in the Sahara desert. The First International Date Conference was held in Tripoli, Libya in 1959 and led to the development of a special program under the Food and Agriculture Organization of the United Nations to promote the commercial utilization of substandard or physically defective dates. Young leaves are cooked and eaten as a vegetable, as is the terminal bud or heart, though its removal kills the palm. In India, date seeds are roasted, ground and used to adulterate coffee. The finely ground seeds are mixed with flour to make bread in times of scarcity. In North Africa, Ghana and the Ivory Coast, date palms are tapped for the sweet sap which is converted into palm sugar, molasses or alcoholic beverages, but each palm should not be tapped more than 2 or 3 times. Tapping the edible date palm interferes with fruit production and it is wiser to tap *P. sylvestris*, which is not valued for its fruit, or some other of the 20 well-known palm species exploited for sugar. When the terminal bud is cut out for eating, the cavity fills with a thick, sweet fluid (called *lagbi* in India) that is drunk for refreshment but is slightly purgative. It ferments in a few hours and is highly intoxicating. [14]. Fresh spathes, by distillation, yield an aromatic fluid enjoyed by the Arabian people.

Other Uses of Date Palm: Morton, [14] reported that Date seeds can be soaked in water until soft and then fed to horses, cattle, camels, sheep and goats. Dried and ground up, they are now included in chicken feed. They contain 7.17-9% moisture, 1.82-5.2% protein. 6.8-9.32% fat, 65.5% carbohydrates, 6.4-13 6% fiber, 0.89-1.57% ash, also sterols and estrone and an alkali-soluble polysaccharide. The seeds contain 6 to 8% of yellow-green, non-drying oil suitable for use in soap and cosmetic products. The fatty acids of the oil are: lauric, 8%; myristic, 4%; palmitic, 25%; stearic, 10%, oleic, 45%, linoleic, 10%; plus some caprylic and capric acid. Date seeds may also be processed chemically as a source of oxalic acid, the yield amounting to 65%. In addition, the seeds are burned to make charcoal for silversmiths and they are often strung in necklaces. In Italy, there are some groves of date palms maintained solely to supply the young leaves for religious use on Palm Sunday. In Spain, only the leaves of male palms are utilized for this purpose. In North Africa, the leaves have been commonly used for making huts. Mature leaves are made into mats, screens, baskets, crates and fans. The processed leaflets, combined with ground up peanut shells and corn cobs, are used for making insulating board. The leaf petioles have been found to be a good source of cellulose pulp. Dried, they are used as walking sticks, brooms, fishing floats and fuel. The midribs are made into baskets. The leaf sheaths have been prized for their scent. Fiber from the old leaf sheaths is used for various purposes including packsaddles, rope, coarse cloth and large hats. It has been tested as material for filtering drainage pipes in Iraq, as a substitute for imported filters. Analyses of the leaves show: 0.4-0.66% nitrogen; 0.025 0.062% phosphorus; 0.33-0.66% potassium; 10-16.4% ash. There is some coumarin in the leaves and leaf sheaths. The stripped fruit clusters are used as brooms. The fruit stalks contain 0.28-0.42% nitrogen, 0.017-0.04% phosphorus; 3.46-4.94% potassium; 7.7-9.88% ash. In Pakistan, a viscous, thick sirup made from the ripe fruits, is employed as a coating for leather bags and pipes to prevent leaking. Posts and rafters for huts are fashioned of the wood from the trunk of the date palm, though this wood is lighter than that of the coconut. It is soft in the center and not very durable. That of male trees and old, unproductive females is readily available and used for aqueducts, bridges and various kinds of construction, also parts of dhows. All left over parts of the trunk are burned for fuel [14].

Date Palm and its Markets: Dates are traditionally marketed all over the world as a high value confectionery, but as fresh fruit they remain an important subsistence crop in most of the desert areas [12]. The Nigeria Date industry has the potential of exporting date fruits and it buy products to the international market but Nigeria is more of a consumer and importer of date fruits and the non-availability of plantations and production data level hinders the country from becoming one of the top exporter of date products and earning foreign exchange. [15]" The marketing potential of date palm fruits in the European market" the EU is an important market in terms of value, even though it imports relatively small quantities of dates. Compared with over half a million metric tonnes imported every year in the world, the EU accounts for 10 percent of the total with some 50 000 tonnes (excluding intra-EU trade). However, it accounts for approximately 30 percent of global date imports in value with a net average of US$85 million per year in the 1999-2000 periods. Imports of dates into the EU were relatively stable from 1990 to 1997, oscillating between 40 000 tonnes and 43 000 tonnes with no clear trend. They increased markedly to approximately 50 000 tonnes in 1998 and have remained at this level since then. The value of imports has exhibited even more stability than quantities. Although the 1999-2000 average value was higher than the 1990-91 average (respectively US$86 and 80 million), a closer look shows that there is no clear growth trend. The value of net imports has varied between US$80 and 92 million for most years over the 1990-2000 decade. The rise in imported quantities in the years 1998 to 2000 did not translate into a higher value of imports (except in 1998) due to the fall in import prices in 1999-2000. Imports of dates into the EU are highly seasonal. They tend to take place at the end of the year, for Christmas and New Year's Eve. In 2001, for example, over 80 percent of EU's imports were made between October and December. This period also corresponds to the date harvest in many supplying countries, in particular in North Africa. However, imports also vary according to the dates of the Muslim holy month of Ramadan. The main consumers of dates in Europe are found in the large and growing Muslim community that mainly consists of people who emigrated from North Africa, South Asia and the Middle East. Traditionally, date fruits are consumed during Ramadan. The Muslim calendar is based on the moon cycle and therefore the dates of Ramadan vary from year to year. The EU countries do not produce dates, except Spain with

very small quantities. France, the United Kingdom, Germany, Italy and Spain account for 85 percent of total EU imports of dates in volume. Today organic Date products are increasingly traded internationally. Although the market contribution is still modest, trends indicate that there is some potential for its expansion. Europe is a primary market for organic products. Currently, Israel, Tunisia and USA (California) export certified organic dates to European countries. Market development has led to other countries, such as Japan, becoming interested in purchasing organic dates. Japan imported 68,873 tonnes of dates in 2006. Producers who have shifted to organic production of dates in Israel and Tunisia are exporting certified organic dates to European countries, especially Germany. In 2000-2001, Tunisia exported 678 tonnes of organic dates, up 60% from 425 tonnes in the previous years [16]. Tunisia and its partners have explored new markets and products for organic dates. An interesting role for this project has been to act as a pump-primer by creating small markets for certain products. The project buys specific varieties to exhibit at diversity fairs. This helps to spread the word and expand the market. They also bought other 'date products', such as baskets made from date palm fronds and used them to display the various date varieties and make them available for tasting. Promoting artisanal activities like basket-making has strengthened the position of women in the oasis communities. Whereas the men control the major cash crops, the women make use of the palm by-products and lesser varieties. Both have further benefited from the introduction of early and late date palm varieties, which have extended the season during which dates can generate an income [17]. Nigeria could adopt some of this projects and policies and adapt it to our economic policy. A crucial study of regional and European markets for date's products which should include preliminary discussions with partners from the private sector to place new products in new markets there by creating a market niche for Nigerian date products. This could be achieved by organizing date fairs, where the public, including policy-makers and producers, can experience the diversity of dates and date products and begin to appreciate its importance, both producers and policy-makers will be more aware of the advantages of date palm tree. Namibia also has a real opportunity to compete on the international market in the future as a major commercial date producer in the southern hemisphere. Since this country can produce dates that are out of season elsewhere, it will be able to produce and supply dates to all major markets during the traditional off-season. The lack of major diseases and pests and the fact that no chemicals are used - the dates are natural/organic products - add value to Namibian dates [18].

CONCLUSION

Date Palm (*Phoenix dactylifera* L) is of great economic and cultural important to the Nigerian economy. Consumption of date fruit in Nigeria far outstrips local production and consequently fruits are imported from the Middle East and neighbouring countries thus depleting foreign exchange. With improved high yielding varieties adapted to the Nigerian ecological conditions, Nigeria has the capacity to produce enough to meet local demands and earn foreign exchange through export of its surplus production in the international market. Perhaps the greatest potential in this respect lies in the commercial development of Date products from naturally occurring species with ready market. The industry not only provides food, raw materials, income, it also provides employment for the growth of the nation. Nigeria is not yet known as a date palm producing country, but not with sanding the country can still achieve its prospect of sustainable economic profit for the citizens if strategies are developed to apply the research and technological progress on ground to boost the productivity of farmers. The establishment of date palm plantations will not only add to the total economic GDP of the country but will invariably check the speeding rate of desertification in the country and it will also make a positive impact on the diet of the people thereby, contributing to the standard of living of not only the farmers but the entire population. Nigeria has two harvesting seasons wet and dry, which is an advantage for the country to compete on the international market when other countries that produce date are out of season. It is a big challenge and Nigeria as a nation can live up to it. More research will still be needed to add to what has already been achieved. In order for the development of date products trade to result in tangible improvement in sustainable management of the date resources in the country, partnership between rural producers, national policy-makers and the private sector is inevitable. The benefits must be channelled in to management of the Date industry.

Recommmendation: The Nigerian date palm industry has the potentials to provide food, raw materials, income and employment to millions of Nigerians. The Nigerian government could make this possible by creating awareness of the break-through NIFOR scientists have

made to improve the date industry. Establishment of a date palm farm settlement scheme is required to accelerate the growth and development of the industry. In order for the Nigerian date industry to meets its full potential farmers and manufactures should be made aware of the importance of cultivating of Date palm, the value chain that which could be derived from date fruits as a source of raw materials and the use of the tree for economic benefits. This will help to encourage more date palm plantation and investor should take advantage of the technology such as the fabrication of mechanical extractor for date juice, fabrication of date fruit drier and a date fruit packaging machine which is a lucrative investment. Credit facility when given to the farmers will boost their productivity to meet up with domestic consumption and export. Provision of standard market facilities, stable market price, product certification and quality control of date product will not only provide employments and alleviate poverty amongst famers; it will also boost the economy of the nation.

REFERENCES

1. Lee, D.R., 1963. Date cultivation in the Coachella Valley California. The Ohio Journal of Science, 63(2): 82-87.
2. Wisegeek, 2011. http://www.wisegeek.com/what-is-a-date-palm.htm
3. Sani, L.A., M.D. Aliyu, A. Hamza, O.A. Adetunji, R.M. Gidado and B.O. Solomon, 2009. Exploring The Nigerian Date Palm (PHOENIX DACTLIFERA L.) Germplasm For *In vitro* Callogenesis.
4. Ikheloa M., I.M. Ugiagbe, C. Okoloe and F.K. Eneh, 2002. Date Production: An Asset for Economic Growth and Development in Nigeria.
5. Nigerian Institute for Oil Palm Research (NIFOR) In house Research Review, 2008. pp: 165-204.
6. Eneh, F.K. and C.N. Nwawe, 2000. Towards Effective Utilization of Research Results: Commericializable Technologies Developed by the Nigerian Institute for Oil Palm Research (NIFOR).
7. Al-Madafi, S., J.S. Al-Hakkak and Y. Ali, 1988. U.A.E. PATENT, pp: 2018.
8. Al- Madafi, S., J.S. Al-Hakkak and G. Kasim, Sh. 1986. U.A.E. patent, pp: 10176.
9. Lemilich, R., R.H. Perry and C.H. Chilton, 1973. Chemical Engineers Handbook, 5th Ed. McGraw Hill-Kogakusha Ltd.,Tokoyo, Section 17: 29-34.
10. FAOSTAT_ Production, 2011. http:// Faostat.Fao.org/ site/ 339/deaflt.aspx
11. FAO. 2003. Agro-Statistics Database. FAO: Roma.
12. Erskine, W., A.T. Moustafa, A.E. Osman, Z. Lashine, A. Nejatian, T. Badawi and S.M. Ragy, 2003. 'Date palm in the GCC countries of the Arabian Peninsula'. Available on: http:// www.icarda.org/ aprp/ Datepalm/ introduction/ intro-body.htm
13. Wikipedia, 2011. The free encyclopedia http://en.wikipedia.org/wiki/phonenix_dactylifera
14. Morton, J., 1987. Date. pp: 5–11. In: Fruits of warm climates. Julia F. Morton, Miami, FL.
15. Pascal Liu, 2002. The marketing potential of date palm fruits in the European market. FAO Commodity and Trade Policy Research Working Paper No. 6. http://www.fao.org/DOCREP/006/J1851E/J1851E00.HTM
16. Fruitrop. 2001. 'Tunisia: Date Exports Increasing', p.6, n.76, January 2001, Montpellier, France.
17. CGIAR. 2006. Date palm project at the halfway mark. Available on: http:// www.ipgri.cgiar.org/ Publications/ 1066/ Date% 20palm% 20project.pdf# search=%22%22Date%20palm%20project%20at%20the%20halfway%20mark%22%22
18. Zaid, A., 1997. Date production support: Namibia. Available on: http:// tcdc.undp.org/ sie/ experiences/ vo15/ Date.pdf