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Sustainable Oil Production in India - A Case Study with Reference to Oil Palm

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INTRODUCTION

Oil palm cultivation assumes significance for augmenting the indigenous availability of edible oil as it is the highest oil yielding perennial crop. With good planting material, irrigation and proper management, oil palm has the potential to produce 20-25 MT fresh fruit bunches (FFB) per hectare after attaining the age of 5 years. This in turn is capable of yielding 4-5 MT of palm oil and 0.4-0.5 MT palm kernel oil (PKO). In comparative terms, yield of palm oil is 5 times the yield of edible oil obtainable from traditional oilseeds. This perennial crop has an economic life span of 30 years, comprising three distinct phases viz. juvenile period (1-3 years), stabilizing period (4-8 years) and stabilized period (9-30 years). Palm oil is one of the major oils traded in global edible oil and fat market. At present, it is the largest source of vegetable oil in the world. Five countries mainly Indonesia, Malaysia, Nigeria, Thailand and Combodia account for over 90% of the world's total production of FFBs.

WHY GOVERNMENT WAS ENCOURAGING THE OIL PALM PRODUCTION?

According to the US Department of Agriculture, the world will produce approximately 76.5 million tonnes of palm oil in 2021, 58% of this in Indonesia, and 26% in Malaysia. No other country produces even 5% of the global supply. Palm oil is cheap and versatile. It is found in everything from lipstick to ice cream. For Indians, though, its primary use has been as a cooking oil. India is the world's largest importer of palm oil – outstripping China, the European Union, Pakistan, Bangladesh, and the US. Over 90% of the palm oil imported is used for cooking, replacing various types of oil seeds, and the total import quantity has grown almost 10 times in the last 20 years. It is to deal with the huge import bill that the government is supposedly encouraging the oil palm production

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OIL PALM CULTIVATION PRO'S AND CON'S

PRO'S

1. High yield to farmers
2. Efficient use of land
3. Source of income for local for local economy
4. May improve living conditions of many people
5. Less poverty and starvation
6. Higher tax revenue
7. Job creation
8. Can be used for many food products
9. Nutrient rich soil
10. Suitable for energy generation through biofuel production
11. Palm oil can be heated to higher temperatures

CONS

1. Sustainability concerns
2. Poor labour conditions

Area Expansion Inputs

Quality of planting materials used greatly determines the productivity and production. It is along with the use of good planting material coupled with proper managemental practices that potential yield level can be achieved. Assistance with be provided to the farmers @ 85% of the cost of planting material limited to 12000/- per ha for entire land holding per planting area of the farmer.

Maintenance Cost of New Plantation

Oil Palm starts producing Fresh Fruit Bunches (FFBs) after 4 years of its planting. Assistance will be given to the farmers under NMOOP @ 50% of the cost during gestation period for 4 years with a ceiling of `20000/- per ha. Up to 25 ha according to the land ceiling act of respective state governments.

Special features of Oil Palm

1. It is a perennial crop that starts yielding from the 4th year of its planting.
2. Productivity per ha is more compare to other oil seeds. Under favourable conditions it can yield 4-6 MTs of oil per ha per annum.
3. Cost of cultivation is less compared to other oil seeds
4. Return from unit area is high compare to other plantation crops.
5. It can grow well in almost all types of soil and in varying climatic conditions.
6. Inter crops can be cultivated up to 5 years.
7. The palm leaf can be used as fodder, an ingredient for organic fertilizers, as fire wood etc.
8. Palm oil is rich in vitamin A and Vitamin E.
9. Theft is less compared to other cash crops.
10. Ability to withstand even in adverse climatic condition.

Oil Palm Cultivation Practices

Most cultivated variety of oil pal in India is *Elaeisguineensis*. This is an African palm tree belonging to fArecaceae family. In India this is mostcultivated as a source of oil. Palm oil obtained from the mesocarp of fruit is used as edible oil and in making of soaps, cosmetics, candles, biofuels, lubricating greases and in processing tin plate and coating iron plates. Palm kernel oil, from the seeds, is used in manufacturing edible products such as margarine, ice creams, chocolate confections, cookies and bread as well as many pharmaceuticals. The cake residue after kernel oil extracted is a cattle feed.The Oil Palm bears a single stem and reaches 20 metres (66 feet) in height. The male and female inflorescences are formed in the same palm. On an average 8-12 bunches can be harvested from a single palm per year.

Soil and climate:

The Oil Palm grows best in areas with a mean maximum temperature of 30-32 ^{0}C and on an average of at least five hours of sunlight. Oil palm is humid crop and requires a well distributed rainfall of 200 cm per annum. However, it can tolerate two to four months of

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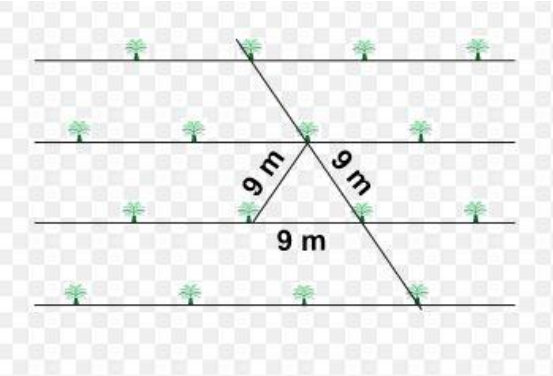
dry spell. The adult palms can withstand occasional water logging, but frequent water logged, extremely sandy and hard lateritic soils should be avoided. Best suited soils are moist, well-drained, deep loamy alluvial soils, rich in organic matter with good water permeability. At least one meter depth of soil is required. Avoid highly alkaline, highly saline, waterlogged and sandy soils.

Cultivated Variety: Tenera.

Planting:

Best season for planting is June-July ie., during monsoon. In case of planting during summer, adequate irrigation and mulching should be given. 12 to 14 months old healthy seedlings with 1-1.3 m height and 13 functional leaf are recommended for planting. Oil Palm is planted in the main field in triangular system at a spacing of 9 m accommodating 140 palms per ha. The polythene bag is torn open and the entire ball of earth is buried in the pit (50cmx50cmx50cm) and leveled. The planting is done as given in the figure.

Triangular Method of planting



Fertilizer Management: Oil Palm is a gross feeder and demands a balanced and adequate supply of macro, secondary and micro nutrients for growth and yield. It is adviced to apply fertilizers at two equal split doses (May & September). The following fertilizer schedule is considered satisfactory for Oil palm

N: P_2O_5 : K_2O (Urea: SSP:MOP)

	g/palm/year	g/palm/year
First year	400:200:400	(870: 1250:670)
Second year	800:400:800	(1740:2500:1340)
Third Year Onwards	1200:600:1200	(2610:3750:2000)

Mg application is necessary only if deficiency symptoms are notices. Supply of sufficient quantities of green leaf or compost is advantageous, especially where the soil is poor in organic matter.

Flowering:

Oil Palm comes to flowering 14-18 months after planting. It produces both male and female flowers separately on the same palm.

Ablation:

Ablation is the removal of male and female flowers produced in the early stages of plantation. This enables the palm to gain adequate stem girth, vigour and develop adequate root system. Start ablation immediately after the appearance of inflorescences on the palms. They can be easily removed by hand or using tool. Ablation

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can be extended up to 2-1/2 to 3 years depending upon the plant growth and vigour.

Pollination:

Oil Palm is highly cross pollinated crop.

Pollinating agent- *Elaedobiuskamerunicus* is most efficient pollinating agent in palm oil

Harvesting:

First harvest can be taken 3.5 to 4 years after planting. When a few ripe fruits are loose/ fall off, the bunch is ready for harvesting. Processing over- ripe fruits reduces quantity and quality of oil.Harvesting should be done 10-12 days interval. During rainy season, harvesting should be done at closer interval of 6-7 days as ripening is hastened after hot summer. In young plantations, we get more bunches with less bunch weight and in adult plantations the bunch weight is more but the bunch number is less. From young palms harvesting of bunches are done using a chisel. The stalk of the bunch is struck hard with the chisel to cut off and push the bunch out. When the palms become taller (from 10 year onwards) a harvesting sickle has to be used.

Yield: 4-8 years: 12 t/ha

After 8 years : 20 t/ha.

SOURCE: https://oilpalmindia.com/opdpnmoop/

OIL PALM CULTIVATION IN INDIA

Oil palm was introduced to India at National Royal Botanical Gardens, Kolkata during the year 1886. The Maharashtra Association for Cultivation of Sciences (MACS), Pune later introduced African dura palms along canal bunds, home gardens and, to some extent, in forest lands near Pune during 1947 to 1959. Large scale planting of oil palm was launched from 1971 to 1984 in Kerala by Plantation Corporation of Kerala Ltd. (subsequently taken over by Oil Palm India Ltd.) and Andaman Forest and Plantation Development Corporation Ltd., in Andaman and Nicobar Islands during 1976 to 1985. Oil palm, as a small holders' crop under irrigated conditions grown under varied agro-climatic conditions, is totally new to India.

In the last two decades, down trend is observed in consumption of edible oils like mustard, ground nut and other vegetable oils whereas the consumption of palm Oil is increased by 6.99% asshownbelow:

India's Edible oil consumption profile (Lakh tonnes)			
Oil	**2001-02**	**2020-21**	**% of increase/decrease in consumption**
Palm	**29.44 (33.12%)**	**87.55 (40.11%)**	**6.99**
Soyabean	22.58 (25.39%)	53.27 (24.41%)	-0.98
Sunflower	3.09 (3.48%)	24.50 (11.22%)	7.74
Mustard	17.21 (19.36%)	26.80 (12.28)	-7.08
Cottonseed	4.43 (4.98%)	14.05 (6.44%)	1.46
Groundnut	12.16 (13.67%)	12.10 (5.54%)	-8.13
Total	**88.91 (100.0%)**	**218.27 (100%)**	

Scenario of Edible Oil in India

The consumption of edible oil in India is at 23.46 MMT with a per capita consumption of 16 kg/ person, India's edible oil production stands at 8.97 MMT in 2020-21 and it is assumed that the consumption may touch 30 million ton by 2025. The deficit of 14.49 MMT of edible oil is being met through imports from Indonesia, Malaysia, Singapore and Thailand (ITC Trade map) spending huge foreign exchange. Out of the total imports, Palm oil accounts for 58.03% i.e., 8.45 MMT of the total imports of 14.49 MMT in 2020-21.

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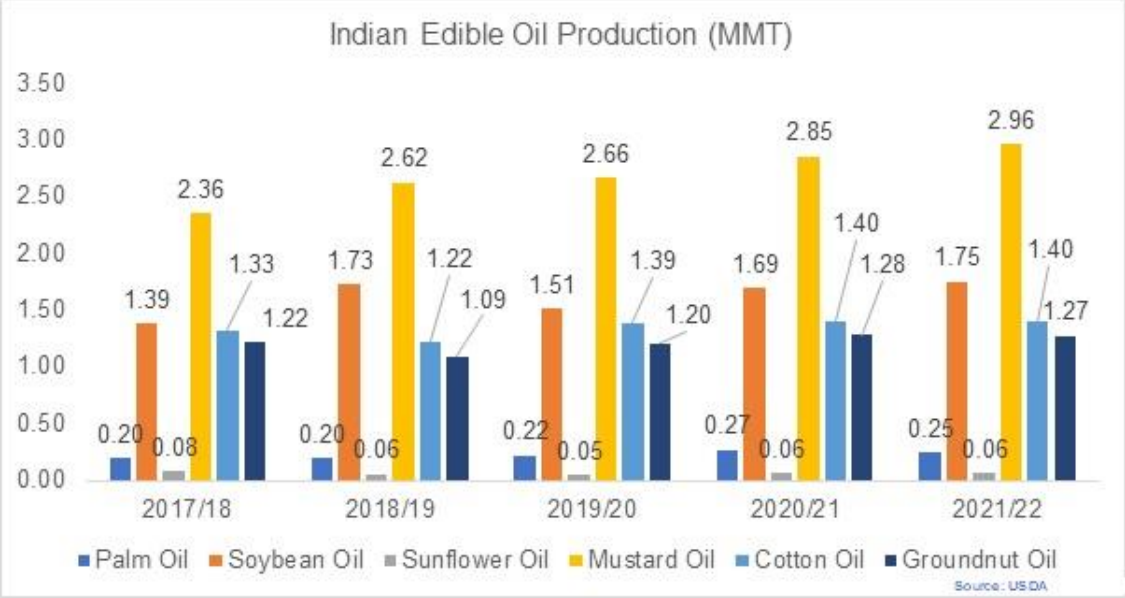

OVERVIEW OF AN PALM OIL INDUSTRY

The world Oil palm area is 241.34 lakh Ha and production is 731.68 lakh MT during 2020 (USDA). Five countries mainly Indonesia, Malaysia, Nigeria, Thailand and Columbia account for over 90% of the world's total production of FFBs. Small amount of oil palm areas are grown in many countries, but the global market is dominated by only two countries i.e., Indonesia (119.50 lakh Ha/435 lakh MTs and Malaysia (54 lakh Ha.,/185 lakh MTs) during 2020 (USDA). Together Indonesia and Malaysia account for over 85% to 90% of world production of Crude Palm Oil. With regard to Palm Oil consumption globally, Indonesia stands 1st in consumption with 150.25 lakh MTs per annum followed by India with 87.55 lakh MTs per annum during 2020 (USDA). The details of major countries consuming Palm Oil as detailed:

Sl. No.	Country	Palm Oil Consumption (Lakh MT) in 2020
1	Indonesia	150.25
2	India	87.55
3	China	67.8
4	EU-27	68.05
5	Malaysia	34.35
6	Pakistan	34
7	Thailand	22.27
8	Bangladesh	16.1
9	United States	13.96
10	Nigeria	16.65

The major Palm Oil importing countries are India, China, European Union, Pakistan, USA & Bangladesh and India is the major palm oil importing country @ 16.29% of world share (USDA).

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OIL PALM CULTIVATION IN TELANGANA

As of now, about 61000 (Of which 37000 acres is under bearing age) is under oil palm cultivation in Telangana, spread across the districts of Khammam, Bhadradri Kothagudem, Nalgonda and Suryapet. Up to 2020 three companies were operating in Telangana viz., TS Oil fed, Godrej Agrovet and Ruchi Soya Industries Limited. Two processing plants of TS Oilfed are in Dammapet and Ashwaraopet mandals of Bhadradri Kothagudem.

The Government of Telangana have allotted factory zones to companies to take up Oil palm Area expansion in the newly identified potential areas in the state by GOI. With this a total of (11) companies are now operating in Telangana including the existing (3) companies. Nurseries are being established in new districts/factory zones by the allotted companies.

Oil palm cultivation and processing in Telangana is regulated through the Telangana oil palm (regulation of production and processing) Act, 1993.

SOURCE:
https://horticulture.tg.nic.in/OilPalm/OilPalm.html

SCHEMES IMPLEMENTED BY GOVERNMENT OF INDIA

National Mission on Edible Oils – Oil Palm (NMEO-OP) as a new Centrally Sponsored Scheme with a special focus on the North east region and the Andaman and Nicobar Islands. Due to the heavy dependence on imports for edible oils, it is important to make efforts for increasing the domestic production of edible oils in which increasing area and productivity of oil palm plays an important part.

SOURCE:https://www.pib.gov.in/PressReleasePage.aspx?PRID=1746942
50 percent subsidy to cultivate the Oil Palm by Telangana Government,to encourage the oil palm production in the state.

SOURCE:https://cm.telangana.gov.in/2020/12/50-percent-subsidy-to-cultivate-the-oil-palm

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