CHAPTER VIII
FINDINGS AND SUGGESTIONS
FINDINGS

After a detailed study of the methods of cultivation, obtaining finance and marketing of Oil Palm Bunches by the selected Oil Palm cultivators in Krishna District of Andhra Pradesh, the findings and suggestions are presented hereunder.

PRODUCTION RELATED FINDINGS

1. At the outset, Oil palm is totally a new crop to the Indian conditions and also to the farmers. It is not an easy task to persuade the farmers to shift from the traditional crops. A new crop with a long gestation period with an investment of Rs. 21,750 per ha would take quite some time for the farmers to be convinced.

2. Triangular method of planting is followed with 9 meter spacing to accommodate 57 plants per acre and 143 plants per hectare.

3. In oil palm, male and female flowers are present on different inflorescences. For fruit development, the pollen from male flowers should reach the female flowers. Weevils are found to be the best agents to transfer pollen from male to female flowers. In the absence of weevils bunch failure occurs and the yield becomes reduced to drastic levels.

4. Oil palm requires adequate irrigation for getting maximum yield. Problems arising out of power shortage can be solved by giving electrical connections on priority exclusively for Oil palm growers. In addition Generator sets are to be provided to growers on subsidy.

5. There are no major pests and diseases for the oil palm crop which becomes beneficial to oil palm cultivators. Unlike other crops pests are seen rarely in oil palm crop. So loss incurred due to the attack of pests and diseases is low for oil palm crop which indirectly contributes for increasing returns.
6. If continuous supply of irrigation and timely application of fertilizers are provided oil palm crop gives very good yields. As regard application of fertilizers the schedule given by National Research Centre for Oil Palm, Pedavegi or the direct instructions by the executives of Oil Palm Processing Units are followed by the farmers. Oil Palm cultivators have to depend on bore well or drip irrigation to provide plenty of water to the plants. In fact, farmers get the eligibility to enter into oil palm cultivation only when they have bore or drip facility.

7. Oil palm can be cultivated in most of the well drained soils with good irrigation facility and hence the cultivation is suitable in 11 districts of Andhra Pradesh namely Krishna, Srikakulam, Vizayanagaram, Visakhapatnam, East Godavari, West Godavari, Guntur, Prakasam, Nellore, Chittore and Khammam. Out of 50 mandals in Krishna District, 24 mandals are identified as potential for the cultivation of oil palm and so it is done under the supervision of Horticulture Department. There are around 6000 farmers cultivating 18835 Acres of land with an average land holding of 3 Acres per farmer in Krishna District.

8. Fifty percent of the nutrient requirement of Oil Palm can be met from the organic sources viz. manure, compost, vermicompost and green manure. If these are used profusely the cost of fertilizers decreases and yield increases.

9. Oil Palm comes to harvest in three years and gives returns to the farmer for every 10-15 days for a period of 25 years. Oil palm cultivation is not associated with the expenses like ploughing the field, planting seedlings every year like other oil seeds like Groundnut, Sunflower, Safflower etc. which makes this crop beneficial compared to other oil seeds.

10. Basically farmers are reluctant to take up Oil Palm crop due to gestation period of 3-4 years, very high initial investment and compulsory irrigation all through the year for entire life of oil palm. It takes 3 years for oil palm cultivators to get the first yield.
11. Power shortage is the major obstacle in oil palm cultivation. New electric connections in rural areas are delayed where oil palm is cultivated. Lack of sufficient power supply results in scarcity of water supply which is the most important one in getting high yield for oil palm.

12. At present the Government through Department of Horticulture extends financial assistance for drip irrigation upto 50% of the total cost exclusively for Small, Marginal, SC, ST and Women farmers and 35% of the total cost for other category of farmers. But the assistance is provided for a maximum of 4 ha per beneficiary.

13. More remunerative crops like Banana, Mango, Sapota, Papaya, Sugarcane and Vegetables are being grown in the Oil palm potential area. Recently farmers got good remuneration from sugar cane due to high rate. If the returns in Oil Palm cultivation are not attractive, the area of Oil Palm cultivation may not increase.

14. In some of the areas for instance, Unguturu and Mylavaram, Magnesium and Boron deficiency is found. This is not a major problem in Oil Palm cultivation. It can be solved by providing Magnesium and Boron supplements.

15. The Directorate of Horticulture Department facilitates the Oil Palm cultivators and processors and creates an enabling environment for the development of Oil palm in Krishna District of Andhra Pradesh. In addition to its regular activities, the Directorate of Horticulture concentrates on the following:

➢ Providing plant material subsidy to developers and nurseries and cultivation subsidy to farmers.

➢ Providing subsidy for micro-irrigation systems in Oil palm and extending the same benefits to weaker sections of the society to encourage them to get involved in the programme.
- Assisting, guiding and facilitating the Oil Palm growers to obtain loans from Nationalized and Cooperative Banks.
- Establishing seed gardens, maintenance of nurseries for supply of quality seed and planting material to the farmers in time at reasonable cost.
- Guiding and facilitating oil extraction entrepreneurs.
- Encouraging private sector investment in Oil palm promotion.
- Monitoring and Evaluation of the program.
- Acting as Nodal agency for Oil palm program in Andhra Pradesh.
- Supporting Oil palm Grower's Associations in marketing Arrangements.

16. Additional support is provided by Horticulture Department to motivate the farmers and the Extension Activities include:
- Target Groups of farmers who satisfy required criteria are identified and selected.
- After considering the basic knowledge possessed by the cultivators, Training is conducted for the benefit of the Cultivators.
- Broad publicity campaign is carried out for awareness generation.
- Irrigation Infrastructure is developed to facilitate oil palm cultivators.
- Appropriate analysis of bio-mass, soil and water is done to identify suitability of bio-mass, soil and water.
- Area specific requirements fertilizers are determined.
- Area-specific and suitable inter-cropping models are developed.
- Credit support and financial arrangement are made available to data sources.
- Regular consultation through established agencies and scientists.
Oil palm cultivation and processing has not yet reached the desired level of performance. The main constraints in raising a plantation of the oil palm and increasing the palm oil production are lack of availability of suitable land, shortage of quality seed of tenera variety (which at present is imported), and lack of modern milling facilities.

17. The crops like tobacco, sugarcane, banana, coconut cotton and chilies are the major competitive crops for Oil palm. In Andhra Pradesh, the farmers have small holdings and cannot afford to grow Oil palm as it is a long gestation period crop. The farmers are encouraged to cultivate Oil Palm by giving subsidies for the first 3 years to raise intercrops.

18. High Mortality Rates between the number of plants originally planted and those surviving at the end of 4-5 years affect the yield. In such case, Oil palm cultivator replaces the lost plants with new seedlings. Consequently, plants with varying ages give differential yield.

19. In 2004 because of low returns in several fields the Oil Palm plants were totally uprooted and the factors related are mentioned hereunder:

a. Cheap imports from Malaysia and Indonesia caused the prices of Fresh Fruit Bunches less than the cost of cultivation.

b. Delay in allotment of Factory Zones to new entrepreneurs and inability of existing entrepreneurs to meet the requirements of oil palm farmers in wide area made the farmers lose interest in Oil Palm cultivation.

c. Another reason is withdrawal of some of the entrepreneurs from the program and so existing entrepreneurs failed to meet the demands of Oil palm farmers.

d. Depletion of ground water and also inability to provide irrigation caused large scale uprooting as continuous water supply or good irrigation is essential for getting good yield.
e. Another factor is inability to recover from the damage caused to the Oil Palm crop due to natural disasters like drought and cyclones.

f. Competitive crops viz mango, sugarcane and paddy became more and more profitable and productive.

20. The private entrepreneurs who were allotted factory zones under this project made huge initial investment for the initial period of 6-7 years for raising of Oil palm nurseries, area expansion and establishment of processing units. Some of the companies which were allotted factory zones dropped from the project in the middle due to financial constraints and hence the farmers who took up Oil palm in that area were also affected. Ultimately the area expansion could not progress.

21. Of late, under a specific programme of Technology Mission on Oilseeds and Pulses, Govt. of India accorded permission for provision of Micro jet sprinklers for Oil palm within the ceiling limit of Rs.25, 000/-per ha. At present the subsidies are being calculated based on the rates approved by the Government of India during 1994. As the prices of the components have gone up now, the beneficiaries are demanding subsidies on the prevailing actual cost of components.

22. Oil palm is cultivated mostly in unirrigated, semi-arid areas and hence remain vulnerable to vagaries of nature. Causes for low productivity compared to countries like Malaysia and Indonesia are:

i. Lack of high yielding varieties of Oil Palm seeds

ii. The small and marginal farmers who cultivate the oil palm crop are not well adapted to new farm technologies.

iii. The progress in respect of Oil Palm has not been substantial for the valid reason that food grains are given first priority in research and development.
iv. There is no effective marketing support and processing support for oil and oilseeds in non-traditional areas.

v. Lack of technical guidance to farmers for oil Palm production.

vi. Low credit flow for Oil Palm production. In fact, more than 85% of the rural banks do not actively lend financial support to Oil Palm farmers.

23. Out of 210 oil palm cultivators surveyed, 96 farmers (46%) opine that the yield of oil palm is low compared to other crops. But the rest 114 farmers accounting for 54% are of the opinion that oil palm yield is not low compared to other oil crops. So majority of the sample population have positive opinion towards the yield of oil palm.

24. According to 183 farmers out of 210 cultivators i.e.87% opine that the price of oil palm is non remunerative compared to other crops. They are not satisfied with the price fixed by the govt. of India.

25. Out of 210 oil palm cultivators, 111 farmers i.e 53% are of the opinion that oil palm cultivation is not much advantageous compared to other oil seed crops. So more than half of the sample population is not satisfied with the benefits accrued by oil palm cultivation.

26. All the 210 farmers i.e. 100% feel that their soil is suitable for oil palm cultivation. In fact, the oil palm cultivation is allowed only after testing the suitability of soil. The soil test is conducted by the scientists in National Research Centre in association with the executives of oil palm processing units before giving seedlings for the cultivation.

27. Out of 210 respondents, 189 respondents representing 90% are of the opinion that labour cost for oil palm cultivation is high compared to other oil seed crops. Also oil palm cultivators have opined that the cost of labour in the initial
years is low and this cost increases with the increase in the age and height of oil palm trees.

28. Out of 210 respondents, 108 respondents representing 51% are of the opinion that risk associated with oil palm cultivation is less compared to other oil seed crops.

29. Out of 210 oil palm cultivators, 180 farmers i.e. 86% have opined that input data for the cultivation of oil palm is available and this information is provided by the executives of processing units and National Research Centre located in Pedavegi. So majority of the sample population are satisfied by the availability of input data for oil palm cultivation.

30. Out of 210 farmers, 135 farmers representing 64% hold the view that technical information is not available when needed. So the technical information should be made available to the oil palm cultivators whenever they need that information.

31. Out of 210 respondents, 156 farmers representing 74% are against oil palm insurance because the insurance can be obtained only when oil palm crop in the entire region is damaged. Damage of oil palm crops of a few farmers in a region cannot be considered for insurance coverage.

32. Through the Z-Test conducted to identify whether there is any significant difference between the incomes obtained through the usage of Borewell and drip Irrigation, it has been identified that there is no significant difference between the incomes obtained through the usage of Borewell and Drip method of irrigation.

33. Through the Z-Test conducted to identify whether there is any significant difference between the incomes obtained through the Oil Palm cultivation with
or without pesticides, it has been identified that there is no significant difference between the incomes obtained through the cultivation with or without pesticides.

34. To assess whether there exists any relationship between Education and Income of the farmers, education and income are divided into different levels. To know whether education and income are significantly related or not chi-square test has been used. Null hypothesis is proved and the result indicates that if the farmer is educated his ability to know the best methods of cultivation would be high and so income earned would be high.

35. To know whether farming experience and income are significantly related or not correlation is used to find whether these two variables are positively correlated or negatively correlated. There is low positive correlation between farming experience and income. It can be interpreted that farming experience has very low influence on the yield of oil palm.

36. To know whether age of oil palm and income are significantly related or not, Correlation is used to find whether these two variables are positively correlated or negatively correlated. There is positive correlation between the age of oil palm and income and both of them are moderately correlated.

37. Correlation is used to find out whether the age of farmer and income are positively or negatively correlated. It indicates negative correlation between the age of farmer and income. It can be interpreted that with the increase in age of farmer, due to his inability to put efforts and lack of knowledge about developments in oil palm cultivation techniques, less income is obtained compared to young farmers.

38. ANOVA Test is used to test for significance of differences among the three sample means and to find out whether the samples are drawn from population
having same mean or not. It has been identified that there is no difference in the yield obtained through the usage of different types of fertilizers.

39. Taking income as independent variable and Number of acres as dependent variable Linear Regression is carried out and It is obtained as $Y = 186.62x + 36169$. So with this the income for a given area can be estimated.

40. From the study it has been identified that Yield is predicted based on age of oil palm, fertilizers, pruning and harvesting using Multiple Regression. The output generated is analysed.

41. In certain fields caterpillar, Bagworm attack Oil Palm but this can easily be solved by the use of Karate, the specific synthetic pythroid.

**FINANCE RELATED FINDINGS**

42. Costs in the cultivation of Oil Palm vary depending upon the age of the plant. Nature of costs varies during 1-3 years, 4-8 years and 9-30 years of Oil Palm Plant.

43. The Net Present Value of the crop at 9% discount rate is Rs. 44,935/-

44. Internal Rate of Return of the crop is 11.25 which are above the rate applied for determining Net Present value.

45. Benefit Cost ratio of the crop is 1.17. As BCR > 1 and so cultivation is cost effective.

46. Sensitivity of risk factors over the cultivation of Oil Palm shows that in pessimistic direction when the market revenue reduced by 10 percent, the net benefit of the farmer (NPV) is reduced from Rs. 44935/- to Rs.15238/-. The
Benefit Cost Ratio correspondingly reduced from 1.17 to 1.06 and IRR falls from 11.25 to 9.6 just nearer to the minimum required rate of return.

47. If all costs are increased by 10%, NPV, BCR and IRR fell to 19092, 1.06 and 9.09 from 44935, 1.17 and 11.25 respectively.

48. Whereas increase of specific costs (fertilizer, harvesting and labour costs) by 10 percent, NPV has reduced from Rs.44935 to Rs.32485. BCR and IRR are 1.12 and 10.62 respectively.

49. The financial indicators are more sensitive to a 10% reduction in the market price of Fresh Fruit Bunches than to the same proportionate increase in costs.

50. Oil Palm cultivation is done either by using borrowed capital or own capital. Under the current study, 60% of Oil Palm farmers have availed of institutional finance and the rest 40% have cultivated their Oil Palm crop using their own capital. Out of the farmers using institutional finance 76% have availed of short term loan and the rest 24% long term loan.

51. Majority of oil palm farmers borrowed money for the maintenance of crop.

52. Oil palm finance is extended by financial institutions through Tri Party Agreement viz. the Financial Institution (Bank), Processing Unit and the Farmer. Finance is extended to the farmer based on the guarantee of Oil Palm processing unit.

53. Funds are released to farmers under Refinance Scheme by NABARD to State Co-operative Banks (For Andhra Pradesh-AP Co-Operative Central Bank). From Co-Operative Central Bank the funds flow to various District Central Co-Operative Banks. From District Central Co-Operative Banks they are disbursed to the farmers through Village Co-Operative Society. But NABARD’s refinance scheme failed to provide timely loans to farmers.
Since the involvement of private entrepreneurs in this project of Oil extraction
has been a new experiment, the formulation, finalization of modalities and
procedures of their involvement are the salient factors for the inordinate delay.

MARKETING RELATED FINDINGS

Market support is extended by the Government through the establishment of oil
palm processing units.

Purchase of Fresh Fruit Bunches by the respective processor of the zone has
been streamlined.

As stated earlier, variety of intercrops are cultivated by oil palm farmers to get
returns during the initial years of Oil Palm cultivation. Some of the most
commonly used varieties are Groundnut, Chilies, Maize, Cotton, Vanilla,
Cocoa and Black gram.

Payment is through cheque by the processing unit to the oil farmers within 14
days from the date of receiving Oil Palm Bunches.

The prices of Fresh Fruit Bunches (FFB) often fluctuate though they are fixed
continuously which are fixed by the price fixation committee comprising the
members from Agricultural Department, Farmer representatives and oil palm
company representatives under the control of Director of National Research
Centre. In fact the price is fixed as per the formula, 33% of the amount
obtained from the sale of Kernel oil and Cake in addition to 12% of the crude
oil price.

Majority of oil palm cultivators want the Minimum Support Price to be
Rs.8000/T. They are of the opinion that when cost of cultivation increases, the
price does not increase in proportion to the cost. As the Minimum Support
Price is not up to their reasonable level, the farmers are demotivated to
continue Oil Palm Cultivation.
61. As a matter of fact, the demand for edible oils is highly income and price elastic. The increase in population coupled with rise in income levels has led to increase in demand at the rate of six percent per annum during the last couple of years.

62. Break-even performances are obtained when the plantation is twelve years old, though returns start accruing from 4th year after gestation period. One has to wait for eight more years to get good returns.

63. Reduction in import duty on edible oil from 65% to 25% has created some doubts among the farmers regarding the profitability of Oil palm crop and its marketing. To get better realization by the farmers on their produce and also to resist cheap imports the existing duty of 25% has to be enhanced suitably.

64. Oil palm has been recognized as one of the highest edible oil yielding crops which can yield 4-6 tons of oil from 3-30 years of life span. It produces 2 distinct oils – Palm oil from the flesh of the fruit and Palm Kernel Oil from the seed or kernel. For every 10 tons of Palm oil about 1 ton of Palm kernel oil is also obtained.

65. Malaysia and Indonesia are the global leaders in the production of oil palm.

66. In India, Horticulture Department has identified Andhra Pradesh, Karnataka, Tamilnadu, Gujarat, Orissa, Goa, Tripura, Assam, West Bengal, Kerala, Maharashtra, and Andaman and Nicobar Islands as potential areas for oil palm cultivation. Out of these states the area covered under the cultivation of oil palm is the highest in Andhra Pradesh.

67. In Andhra Pradesh there are 12 processing units. There are two processing units operating under Krishna District. Major portion of Krishna District is covered by Ruchi Soya Industries Limited, Ampapuram and a minor part is covered by Godrej Agrovit (Only Musunur Mandal).
68. Allocation of crude Palm Oil bunches to processing units is done through Zonal system. Under this system Palm cultivating areas are divided into zones and each zone is allocated to the processing unit in that area.

69. To prevent Oil palm farmers from uprooting their crop due to sudden fall in the Oil Palm bunch prices; Government has introduced Market Intervention Scheme under which Minimum Support Price is given to the farmers irrespective of price (if price falls below MSP). Now it is Rs. 5000/T.

70. VAT is imposed on the FFB of Oil palm bunches. Usually VAT is imposed on manufactured goods but for oil palm price is fixed after deducting VAT. Oil palm farmers strictly oppose this decision taken by the Government.

71. Oil Palm farmers find it difficult to cope up with the continuous changes in the price of oil palm FFB.

72. Major importers of oil Palm are Indonesia, Malaysia, Thailand, Singapore and Srilanka. Major exporters of Oil Palm and its products are Indonesia, Malaysia, Bhutan, Banglasdesh and Singapore.
SUGGESTIONS

1. Sufficient quantity of quality seedlings should be supplied to the new cultivators of oil palm. High yielding dwarf hybrid varieties must be made available for the farmers to assure high returns to the oil palm cultivators. Seed Certification Agencies, Seed Testing Laboratories and Enforcement Agencies of the State have to be strengthened.

2. New cultivation procedures should be made available and new entrepreneurs are to be given encouragement to develop healthy competition. Number of oil palm processing units should be increased by establishing them in new areas so that increased competition among the processing units can be beneficial to oil palm cultivators.

3. Technical support and training should be given to oil palm cultivators as any wrong decision or negligence on the part of the oil palm cultivator would effect on the yield of oil palm. Moreover, once the farmer chooses oil palm cultivation, it is not easy to switch over to other crops as the process of uprooting and land preparation is very expensive.

4. At the initial stage, harvesting is not a problem for the farmer but with the increase in age of the plant harvesting is becomes difficult and costly. And so there is need to improve Harvesting Technology.

5. It is suggested that Price fixation formula and Fresh Fruit Bunch price should be revised. Minimum Support Price ought to be at least Rs.8000/T.

6. Measures to be taken by Central Government

➢ It is suggested that Central Government should focus on evolving / importing drought tolerant and dwarf varieties of oil palm seeds. Government has to encourage private parties to set up seed gardens and speed up the same to produce adequate tenera seed to meet the domestic demand.
➢ It is suggested that Central Government should change the pattern in planting so as to provide broad interspaces in order to promote intercropping.

➢ Efforts should be made in increasing the vegetable oil production domestically to meet the demand of the growing Indian population. The present level of consumption is the sure indication that the demand for palm oil ever increases due to its eco-friendly nature and its potential use as bio-fuel. Indeed many countries deem it as the main source for bio-diesel. Therefore the Central Government should take up steps to produce more and more palm oil in the country to meet the internal demand.

➢ The unit cost for micro irrigation should be increased to Rs. 25,000 per ha and rate of subsidy also has to be increased from 30% to 50%.

➢ Another suggestion is that Central Government should focus on the revision of Fertilizer schedule to increase the output.

➢ There is need for Central Government to enhance outlay for innovative components so as to make harvesting less expensive and more informative.

➢ The procedure for disbursement of subsidies should be standardized and made uniform in all the states by the Central Government to take up necessary activities at the right time by the oil palm cultivators.

➢ Central government should ensure uniform pricing policy all over the country not only for FFB but also with regard to the price of seedlings.

➢ There is need for Central Government to make oil palm Crop Insurance Comprehensive. To be more specific, insurance for individual plants, farmer wise, and village wise should be covered in order to avoid losses due to natural calamities, pests and diseases. This can build up confidence among the farmers in the cultivation of oilseeds on a large scale. If this comprehensive oil palm insurance policy is implemented, the output would be beyond belief in near future.

➢ Central Government should ensure that immediate requirement of the planting materials should be made available to all oil palm cultivators either through import or by augmenting the existing indigenous production.
➢ Prior demand surveys need to be conducted by the respective state departments and processors at village level every year and the reports should be submitted to Central Government.

➢ It should be understood that faster setting up of the processing mills in the identified areas would not only boost the area expansion in the newly introduced areas but also induce confidence among the oil palm farmers.

➢ The Central Government should have such a plan to exceed or at least to reach the vision of Malaysia to produce 35 t FFB per Hectare with an oil extraction ratio (OER) of 25% by 2020.

➢ The use of red palmolein, rich in pro-vitamin A for the prevention and cure of the eye diseases due to Vitamin A deficiency needs to be given wide publicity.

➢ Price Stabilization Fund should be created to help the oil palm growers face the adversities during the price fluctuations.

➢ Subsidy should be given to Oil Palm Growers irrespective of ceiling limits and the hurdles at various stages of implementing the Oil Palm Development must be removed.

➢ Since Oil Palm has been emerging as a major perennial source for vegetable oil and there is scope for bringing about 1.0 million ha under oil palm by 2020 and to produce 3 to 4 million tons of palm oil and 0.3 to 0.4 million tons of palm kernel Oil by 2025, it is necessary to consider setting up of a National Oil Palm Board to take up all aspects of oil palm right from seed to Oil Palm marketing.

➢ Subsidy components viz. bore wells and power connections should be allotted in required areas beyond assigned targets so as to facilitate area expansion.

➢ Permission for import of tissue culture seedlings should be granted to private entrepreneurs,
➢ Oil palm, should be given plantation crop status.

7. Measures to be taken by state Government

➢ The process and program can be better if the State Government ensures enactment of Oil palm Act
➢ State Government has to conduct intensive publicity/Awareness Campaigns about the benefit of cultivating oil palm crop
➢ Sufficient land should be allotted for Oil palm Nursery
➢ In addition land for R & D Farm / Seed Garden should be allotted.
➢ Price for exotic and indigenous seedlings must be fixed.
➢ Disbursement of subsidies has to be properly arranged..

➢ Setting up of State Level Seed Committee in each and every State is a must to have advance planning and co-ordination amongst various agencies involved in seed production, distribution and quality monitoring.

➢ Concerted efforts should be made to follow Good Agricultural Practices in improving the oil palm yields of small holder’s plantations so as to improve the national average.

➢ Efforts should be made to promote oil palm cultivation by encouraging farmers in the way of supplying quality planting materials, extending drip irrigation facilities to older plantations, providing crop insurance and implementing effective technologies.
The procedures involved in the area allocation to the processors have to be expedited, and the processors must be insisted on recruiting adequate technical staff so as to provide required technical assistance to farmers.

The Project Management Committee in the concerned states should be activated and regular review meetings should be conducted every three months.

Oil Palm Act should be enacted where it does not exist and the same is to be revised wherever necessary.

Keeping area expansion in view Micro level surveys should be taken up in different states.

8. Measures to be taken by Horticulture Department

Prior arrangement of suitable high yielding varieties should be done from reliable sources such as NRC, Research Stations and other Institutes. The factors viz. quality, price distribution of seeds and enforcement of Seed Act must be regulated.

Proper scheduling of activities should be done as per Action Plan. Procurement of inputs from various sources should be done well in advance.

Horticulture Department should work in consultation with established sources and agencies such as the ISOPOM, National Research Centre, Foods, Fats & Fertilizers Ltd., Horticulture Directorates in other States in implementing the program.

In addition Horticulture Department should arrange advanced marketing through MOUs between growers and buyers.

Oil palm cultivation should be promoted and processing should be encouraged under cluster approach.
- Private sector investment should be encouraged in the establishment of processing units.

- Insurance arrangement should be made easy.

- Financial assistance should be extended for farmers to motivate and support them.

- Proper care and attention to the plantation should be taken to prevent mortality and immediate gap filling of Oil Palm plantations and augmentation of adequate irrigation facilities to make the plantation have high yield levels.

- Processing unit executives should keep in contact with the oil palm cultivators to solve their cultivation related problems and to make proper fertilizer recommendations.

- Processing unit executives should recommend suitable intercrops to the oil palm cultivators in order to ensure sure returns even during the Pre-Bearing Stage of Oil Palm.

- Farmers should also be informed about appropriate pest control measures and introduction of pollinating weevil.

- Oil palm cultivators should be shown the method of development of Vermicompost in the plantations.

- There should be Liaison between financial institutions and cultivators to provide credit facility.

9. Suggestions for the crop development

- There is need for setting up a national oil palm board as there is no apex body to coordinate the activities related to the cultivation and marketing of the crop, and in view of its growing importance for the edible oil security of the nation.
Subsidy facilities should be extended to farmers to make them get necessary tools and machinery at a lower rate to facilitate better harvesting.

In addition subsidy for bore wells/dried bore wells must be provided.

Micro irrigation should be made available to marginal and small farmers with full subsidy in order to make oil palm cultivation profitable.

Subsidy should be provided for the cultivation of intercrops grown in oil palm at the initial stage.

Credit facilities, input supplies, irrigation, improved machinery are the four major factors which contribute to better cultivation and better harvesting and hence all the four must be made accessible to farmer.

10. Measures to be taken by NRC

Adequate technical support, guidance and beneficial services should be extended to the farmers from National Research Centre for Oil palm in all related aspects.

Training in seed technology, seed production, quality control and distribution, should be arranged on an extensive scale.

Should design and develop an efficient harvesting tool for tall oil palm plantations

Recommendations on specific location for irrigation and fertilizers management have to be implemented. Moreover, suitable drip system for pure crop and micro irrigation system for inter/mixed crops should be provided.

A scientific price fixing formula has to be worked out for fresh fruit bunch.

Efficient recycling of farm wastes should be done as a part of integrated nutrient management.
Adequate standards for harvesting and dissemination of technology including grading of FFB have to be developed.

Scientists of National Research Centre for Oil Palm should have adequate exposure to developmental technology in other oil palm growing countries like Malaysia, Indonesia, Ivory Coast, Nigeria and such.

State level seminars must be organized involving scientists of NRCOP for effective transfer of technology from lab to land.

Efforts should be made by National Research Centre and the Processing Unit to extend the irrigated area for Oil palm cultivation.

11. Suggestions for Farmers

Farmers should increase the overall productivity level to bring National average of 20 t FFB/ha/year.

Harvesting should be done when the bunches are at correct maturity stage following the ripeness standards. Immature bunch harvest will reduces Oil Extraction Rate and leads to loss of oil.

All farmers should make use of the biomass obtained from the oil palm fields by converting into vermi compost or compost which increases soil health and reduces the quantity of fertilizers.

Intercropping should be introduced during the juvenile stage without hindering the growth of Oil Palm.

Unripe fruits yield low oil and over ripe fruits tend to become rancid and hence Palm fruits should be harvested at optimum maturity stage.

Inter cropping of cocoa in oil palm should be taken up only when sufficient light is available inside the oil palm garden in a single hedge system i.e., at least half of the light that is available outside.
➢ In regions where fertilizer recommendations are not available, farmers are advised to modify the general recommendation based on leaf analysis report.

➢ Farmers should adopt micro-irrigation to irrigate oil palm and save water, giving 150-200 lit/palm/day generally depending on soil and climatic conditions and around 300-350 lit/palm/day during summer season.

➢ Oil Palm growers in the country should constitute a National Oil Palm Growers Federation similar to that of other Horticultural crops in the country which are supported by the Department of Agriculture and Cooperation.

12. Suggestions for Entrepreneurs

➢ The improved mechanization has doubled the efficiency of the milling process in oil palm and hence this machinery must be installed in many areas in order to make it accessible to all the farmers.

➢ Entrepreneurs should play an important role in oil palm development in their respective allotted zones by recruiting efficient for effective transfer of production technologies to oil palm growers. They should guide the farmers in raising inter/ mixed crops establishing of soil testing and plant tissue analyzing laboratories by private companies, and helping the farmers in their areas for effective nutrient management and also in maintaining proper weighing of produce at the collection centres.

➢ Processors should Research and Development wing to educate Oil Palm farmers.

13. Suggestions to Financial Agencies/NABARD/ Crop Insurance

➢ In order to encourage Oil Palm cultivation, the Financial Agencies and Nationalized Banks should support the farmers and the industry by extending
credit facilities without red tapism. NABARD may monitor such activities regularly as was done earlier by allocating funds every year.

- Insurance agencies should come forward to work out a viable crop insurance policy in consultation with farmers, processors, and Government agencies and implement in the field quickly.

- Supply of improved seeds at reasonable rates to increase seed replacement ratios, integrated nutrient supply and effective crop management are very significant aspects. Good market facilities for better oil extraction and strengthening of processing structure and modernization of extraction process can certainly lead to glorious development of Oil Palm Industry. It should be borne in mind that integrated pest management practices are very important in reducing the cost of production and sustaining productivity to make the sector globally competitive. When all these measures are adopted to the core, India can certainly become self-reliant in Oil Palm yield and increase exports to earn sizeable foreign exchange.

14. Measures for improving seed Quality

- Adequate number of seed processing plants should be set up where required. Moreover storage facilities should be provided to make the seedlings ready for transplantation. Seed cleaning machines should be set up for cleaning the seeds.

- Adequate retail points are to be installed by National Seed Corporation, State Seed Corporation, Co-Operative Agro Industries Corporation, IFFCO and Private Seed Producers. Besides more mobile vans are to be provided for distribution of seeds in the interior. All primary co-operative societies should be enabled to sell fertilizers and pesticides on a “single window” concept.

- Financial assistance in the form of short-term loan, equity, bank loan, etc., should be given to the seed producers and distributors.
One of the major constraints for low productivity of oilseeds is the non-availability of good quality seed. Therefore the best variety of seeds certified by National Seed Corporation and State Seed Corporation should be distributed to the Oil Palm Cultivators. There should be at least one seed farm in each and every zone throughout the state. A special committee should be set up at state to do advance planning and to have co-ordination amongst various agencies involved in seed production, distribution and quality monitoring.

Prior to the process of sowing the seed should be treated with fungicide or bactericide as recommended by NSC and SSC.

A fine seed bed free from weeds and clods should be prepared to facilitate good germination and better survival. The field should be kept free from weeds particularly during 20-30 days of sowing.

15. PRODUCTION RELATED SUGGESTIONS

The sowing of seed should be done at appropriate time with proper row spacing and the seedlings should be properly maintained by the process of thinning 15-20 days after sowing. Early sowing escapes the attack of many diseases and pests.

Incentives should be given to the farmers to cultivate Oil Palm varieties with higher oil content. This can be achieved by linking the purchase price of oilseeds with the oil percent as has been done in the case of sucrose content in sugarcane.

It is obvious that Pests and diseases reduce the yield and so suitable pest and disease management practices are of greater importance. Therefore. Such practices should form an integral part of the overall oil Palm crop management. The extension agencies should be geared up to demonstrate the advantages of plant protection measures to the Oil Palm growers. The formulated pest and disease control schedules should be popularized. The possibility of custom
service facilities with respect to insecticidal spraying and the related plant protection practices should be looked into. Subsidy should be given on plant protection chemicals, and the spraying tools.

- It is necessary to provide weed-free environment particularly in the early stages of the crop. This can be done either by manual or chemical methods. Weedecides like Glycyl / Roundup should be used to prevent the growth of weeds in Oil Palm crop. Farmers can employ labourers to remove weeds if it is cheap and available.

- Productivity can be increased through plant replacement where necessary and the use of quality seed. In addition mass scale plant protection measures, increased use of chemical and bio-fertilizers and improved agronomic practices lead to good productivity.

- Water logging condition is very harmful to Oil Palm crop and hence the field should be of good level so that good drainage can be possible.

- Harvesting should be done at right time to avoid capsule shattering and to prevent reduction in oil content.

- In order to minimize the bad effects of pesticide residue on Oil Palm it is necessary to provide technological backup, effective regulatory framework and its effective implementation. Research in this aspect is very much necessary not only to prevent the bad effects of pesticide residue but also to promote phyto-sanitary measures in the trade.

- Bunch failure is common in the absence of weevils and it leads to yield reduction to the drastical levels and so the Oil Palm cultivators should take proper care so that the fertilizers, pesticides and weedicides used by them should not harm weevils.
➢ Oil palm requires adequate irrigation to get maximum yield. Power shortage hinders better yield possibilities and so generator sets are to be provided to growers on subsidy.

➢ Organic sources of fertilizers like manure, compost, vermicompost and green manure increase the fertility level of the soil and so Oil Palm farmers should increase their usage instead of inorganic manure so that the cost of fertilizers can be decreased and the yield can be increased.

➢ The assistance for drip irrigation of 50% of the cost for Small, Marginal, SC, ST and Women farmers is provided for a maximum of 4 ha per beneficiary. The limit on the area eligible for assistance should be increased for the reason that the assistance of only 35% of total cost is given for other category of farmers.

➢ Drip system subsidy is cumbersome and it is not available to all the cultivators (Cultivators with less than or equal to 4 Hectares). Procedure for availing of drip system subsidy should be made transparent and easy for all the oil palm cultivators.

➢ Uprooting of oil Palm plants should be prevented by fixing price of Oil Palm Bunches according to the prevailing cost of cultivation and also the performance of processing units to see whether the processing units in the concerned zone have the capacity to process the total production.

➢ Infact the establishment of processing units requires huge investment and so the incentives provided to industrial units under Target 2000 scheme need to be extended for the Oil palm processing units also.

➢ The Government should consider the matter of revising the components and also including certain components like HDPE pipes for effective implementation of drip irrigation in Oil palm.
Subsidy should be provided for Pesticides, fertilizers and Weedicides since 48% of Oil Palm cultivators strongly opine for the same.

16. FINANCE RELATED SUGGESTIONS

Timely credit should be made available to the Oil Palm farmers through co-operatives and other financial institutions to enable them to use requisite inputs so as to increase production of oilseeds.

The financial indicators are more sensitive to the Market price of Fresh Fruit Bunches than the costs. So the market price should be fixed at least equivalent to the costs.

At present subsidies for plant material and cultivation are being given uniformly to all categories of farmers. The farmers belonging to SC/ST may not afford to purchase the plant material and hence the same may be supplied to them on full subsidy. The subsidy for cultivation may be given at 75% of the NABARD unit cost to encourage the said category of farmers.

Easy access to Institutional finance should be provided to Oil Palm cultivators in order to prevent them from going for non-institutional sources which levy heavy charges.

Proper support should be extended by the banks to the oil palm cultivators. Verily there is no display regarding support for oil palm in any nationalized bank. This must be checked by extending additional support to the Oil Palm Growers.

Inability of oil palm cultivators to use necessary crop protection measures in a year due to lack of funds may decrease the productivity in consecutive years. At present oil palm cultivators are given access to institutional finance only through crop loan, and also a special line of credit needs to be provided to the farmers through banks for taking up Oil palm cultivation.
Continued financial support at a higher level from the government for oilseeds research and development in the country is very much essential in the present era of liberalized world trade. As regards oilseed crops where hybrid technology is not available, private sector is not forthcoming with any input. Therefore it is indispensable to organize all research activities and priorities in a matrix mode of operation. The technological development should be more focused to generate technologies to facilitate farm resources with low external inputs.

The significant point is that the oil palm farmers have to take care of the nutrients in Oil Palm crop. Whenever Magnesium and Boron deficiency is identified, immediately Magnesium and Boron supplements should be given as this deficiency decreases the yield of Oil Palm.

17. MARKETING RELATED SUGGESTIONS

Support price policy: Owing to sensitiveness of oilseed crops to market forces, the support price needs to be continued and strengthened. Although the government has continued with support price policy, there has not been any market intervention in recent years when the market prices fall below the support prices leading to distress sale and diversion of oilseed area to other crops. Effective market intervention to prevent distress sale by farmers is the prime requisite continued patronage of oilseeds by the farmers. It is also important to develop a market mechanism of offering higher price for quality oilseeds with higher oil content and of better quality. Hence, while announcing the support prices, quality consideration as a matter of principle should be kept in view to provide a sense of direction to the researchers and oilseed growers. The government should also strictly enforce quality regulations.

As harvesting becomes difficult with the increase in age and length of Oil Palm, harvesting machines should be introduced by National Research Centre.
or the imported machinery from Malaysia and should be made available to Oil palm Cultivators. Oil palm farmers are of the opinion that harvesting costs should be borne by Processing units.

➢ National research Centre for Oil Palm at Pedavegi should innovate hybrid varieties of oil palm to have higher yield.

➢ The support price announced by the Government should be in correlation with open market prices. Under present system there is no mechanism of offering higher price to produce high quality oilseeds.

➢ **Seasonally variable import duty**: India is the largest importer of edible oil in the world. Import duty structure is the main tool in the hands of the government to regulate imports. The liberalized import policy appears to have brought stability in the prices of edible oils during the lean season, while it has failed to take care of the situation in peak seasons. In fact this policy generally safeguards the consumers’ interests in the way of enough supply of edible oils at steady price, but the interests of farmers, processors and oilseed sector as a whole need to be integrated to provide sustainable momentum for balanced growth. This can be taken care of to some extent by following the system of “Seasonally variable import duty” thereby having higher and lower import duties during peak harvesting season and lean season, respectively.

➢ Government should focus on the development of infrastructural facilities viz. roads, ports, storage and transportation so as to make India self sufficient and supreme in Oil Palm cultivation on par with Malaysia.

➢ **Support price**: There must be market mechanism for offering higher price for oil Palm bunches of higher quality with higher oil content. Hence, while announcing the support prices, quality consideration should be the very first principle.
It has been observed that the price of oil palm is low, when the output is high and vice versa. Hence the farmers state that Minimum Support Price should be 7000-8000/- irrespective of the output.

Oil palm should be exempted from VAT Taxes. VAT is imposed on the FFB of Oil palm bunches. Usually VAT is imposed on manufactured goods but for oil palm price is fixed after deducting VAT.

Oil Palm farmers find it difficult to cope with the continuous changes in the price of oil palm FFB. So measures should be taken by the Government to control the price fluctuations and to support the oil palm cultivators in order to increase the area under cultivation of oil palm.

Rational import duty policy: The interests of the consumers, farmers, processors and the oilseed sector as a whole need to be integrated to provide sustainable momentum for the well balanced growth of the edible oil sector. Moreover, the import duty policy should be rational so as to provide protection to domestic farmers.

Irrigation charges: Oil Palm requires less water as compared to many cereals, commercial and other crops. Hence, suitable policy decision to levy irrigation charges commensurate with the water used rather than on flat area basis can make oilseed cultivation more competitive.

Self-reliance: Achieving self-reliance for oil palm is of paramount importance. This calls for new thrust to improve the productivity of Oil Palm crop through exploitation of the commercially untapped yield reservoir by effective technology transfer, demand driven research agenda to meet new threats and exploit fresh opportunities, value addition to Oil Palm Seeds and their products and by-products to make them more competitive.

Area expansion: As a matter of fact, to bring additional area under Oil Palm cultivation due to exhaustion of cultivation area. Hence, newer approaches to
expand their cultivation under different cropping/farming situations become imperative. It is suggested that the executives of processing units should take the responsibility to motivate the farmers to start oil palm cultivation.

21. **Improving productivity:** Crop ecological zoning is one of the important strategies for efficient production of Oil Palm and it helps in realizing potential yields with high input use efficiency. All the efforts to increase the area under oilseeds need to be dovetailed to these crop ecological zones. Supporting services like input-supply, marketing and processing have to be linked to these crop ecological zones besides strengthening of research and extension systems. Infrastructural shortcomings faced by the Oil Palm farmers have to be analysed in order to endeavour and overcome so as to be bold and competitive. Then only large areas can be brought under minimal inspection.

22. **Effective technology transfer:** Concerted efforts are compulsory to transfer the existing technologies from lab to land. The data generated from the large number of frontline demonstrations organized by the Directorate of Oil Palm Research during the last 13 years in the farmers’ fields across various crops, seasons and situations suggest that yield increases ranging from 36 to 88 percent with additional production potential of about 19 million tonnes. The incremental benefit cost ratios also ranged from 2.01 to 5.18 and so it clearly indicates that the technologies are not only productive but also cost-effective.

23. **Research funding and prioritization:** It is essential that the government should allocate funds for oilseed research and development. Moreover, broad guidelines and objectives of research and research activities are to be prioritized and organized in a matrix mode of operation.

24. **Processing efficiency:** The processing efficiency of oil palm has to be enhanced on a commercial scale. It is crystal clear that when the efficiency of...
processing units is improved, it can reflect on country’s self sufficiency and positive competition in the world market at large.

25. Pesticides residues: Research to minimize pesticides residues in the products and by-products needs technological back up and regulatory framework as well as its effective implementation. Phyto-sanitary measures have to be made more significant.

26. Inter-sectoral linkages: The present farmer-research-industry-policy oriented sector should be strengthened in order to achieve the overall development of the Oil Palm cultivation and industry. The steps to reach the aspired goal are commercial exploitation of untapped yield reservoir, value addition in Oil Palm and its by-products, demand-driven research programmes and the very important congenial public policy environment.