A STUDY ON THE STATUS AND PERFORMANCE OF CONTRACT FARMING IN MIZORAM WITH SPECIAL REFERENCE TO OIL PALM

A THESIS SUBMITTED
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

KHAWLSIAMTHANGA KHAWLHRING
MZU REGISTRATION NO: 1506367
Ph. D. REGISTRATION NO: MZU/Ph.D/1136 of 02.05.2018

DEPARTMENT OF MANAGEMENT
SCHOOL OF ECONOMICS, MANAGEMENT
AND INFORMATION SCIENCE
FEBRUARY, 2023

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BY

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SUPERVISOR

PROF. L. S. SHARMA

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IN MANAGEMENT OF

MIZORAM UNIVERSITY, AIZAWL

MIZORAM UNIVERSITY

Department of Management
School of EMIS
Aizawl-796004, India
Tel: 2330710/2330261/9862569024
Email : lsksharma@yahoo.co.in

Prof. L. S. Sharma
Head

CERTIFICATE

This is to certify that

1. Khawlsiamthanga Khawlhring having registration no. MZU/Ph.D/1136 of 02.05.2018 is a research scholar of Department of Management working under the supervision of Prof. L. S. Sharma, Department of Management, Mizoram University.
2. He was admitted for the PhD Programme through open advertisement, written test and viva-voce.
3. He has fulfilled all the prescribed/mandatory regulations under UGC (Minimum Standards and Procedure for Award of M.Phil./Ph.D Degrees) Regulations, 2016 for pursuing PhD Programme in Management.
4. He has also published research papers in the refereed journals which is mandatory prior to submission of PhD thesis under the said UGC Regulations 2016
5. *"**A Study on the Status and Performance of Contract Farming in Mizoram with Special Reference to Oil Palm"*** by Khawlsiamthanga Khawlhring. has been written under my supervision.

Dated Aizawl
The 28th February, 2023

(Prof. L. S. Sharma)
Supervisor

MIZORAM UNIVERSITY

FEBRUARY, 2023

DECLARATION

I, Mr. Khawlsiamthanga Khawlhring, hereby declare that the subject matter of this thesis *"**A Study on the Status and Performance of Contract Farming in Mizoram with Special Reference to Oil Palm"*** is the record of work done by me, that the contents of this thesis did not form basis of the award of any previous degree to me or to do the best of my knowledge to anybody else, and that the thesis has not been submitted by me for any research degree in any other University/Institute.

This is being submitted to the Mizoram University for the degree of the Doctor of Philosophy in Management.

Dated Aizawl
The 28th February, 2023

(KHAWLSIAMTHANGA KHAWLHING)

(Prof. L. S. SHARMA)
Supervisor
Department of Management,
Mizoram University

(Prof. L. S. SHARMA)
Head of Department
Department of Management,
Mizoram University

ACKNOWLEDGEMENT

First of all, I would like to express my heartfelt gratitude to my Supervisor, Prof. L.S. Sharma, Professor & Head, Department of Management for his untiring support and guidance. I would also like to thank the faculty members and staff of the Department of Management, Mizoram University for their valuable help and encouragement.

I would also like to express my sincere thanks to Mrs. Maria C.T. Zuali, Mr. Vanlalmawia, and Mr. Lalhmunsanga Hnamte, the then Directors of SIRD&PR, Mizoram, Dr. Irene Zohlimpuii Chongthu, present Director, SIRD&PR, Mizoram, Aizawl for permitting me to pursue this research and for making all kinds of favourable arrangements. I feel blessed for receiving supports from various friends and colleagues during my research works and I sincerely thank the Oil Palm growers of Mamit, Kolasib, Serchhip & Lunglei Districts, officials from Department of Agriculture, Government of Mizoram, Officials from Godrej Agrovet Ltd. and Ruchi Soya Ltd (Patanjali Foods Ltd.) for their cooperation and provision of data for the success of my research works.

I would like to take this opportunity to thank my family for their support. Special thanks to my wife, Rondy Lalrinpuii, for her untiring support and encouragement during my research work. It is always the blessings of God that I could complete my work by His Grace.

Dated Aizawl
The 28.02.2023

KHAWLSIAMTHANGA KHAWLHRING
Research Scholar

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ACRONYM

AAY	: Antyodaya Anna Yojana
ADP	: Delta Agricultural Development Programme
MoAFW	: Ministry of Agriculture and Farmers Welfare
ANOVA	: Analysis of Variance
APL	: Above Poverty Line
APMC	: Agricultural Produce Marketing Committee
BMP	: Best Management Practices
BPL	: Below Poverty Line
BPS	: Badan Pusat Statistik (Statistics Indonesia)
CBR	: Cost-Benefit Ratio
CF	: Contract farming
CFA	: Contract farming arrangement
CPO	: Crude palm oil
DoA	: Department of Agriculture
ECA	: Essential Commodities Act
ET	: Economics Times
FAO	: Food and Agriculture Organization
FAOSTAT	: Food and Agriculture Organization Statistics Division
FAPAFS	: The Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Bill

FELDA	: Federal Land Development Authority
FFB	: Fresh Fruit Bunch
FFV	: Farming of fresh fruit and vegetables
FPTC	: Food Processing Training Centres
GAP	: Good Agricultural Practices
GCF	: Gross Capital Formation
GHG	: Greenhouse Gases
GoM	: Government of Mizoram
GSDP	: Gross State Domestic Product
GSVA	: Gross State Value Added
GVA	: Gross Value Added
HA	: Hectare
ICAR	: Indian Council of Agricultural Research
IEEFL	: Ion Exchange Enviro Farms Ltd
IIOPR	: Indian Institute of Oil Palm Research
ILFHS	: Indonesian Livestock Farm Household Survey
INM	: Integrated Nutrient Management
IPM	: Integrated Pest Management
ISFM	: integrated soil fertility management
ISOPOM	: Integrated Scheme of Oilseeds, Pulses, Oil Palm & Maize
ITC	: Indian Tobacco Company

IUF	: International Union of Food, Agricultural, Hotel, Restaurant, Catering, Tobacco and Allied Workers' Associations
KG	: Kilogram
LAPS	: Large Agricultural Plot Scheme
LGA	: Local Government Area
LSC	: Land Settlement Certificate
MACS	: Maharashtra Association for Cultivation of Sciences
MANR	: Ministry of Agriculture & Natural Resources
MES	: Mizoram Economic Survey
MGNREGS	: Mahatma Gandhi National Rural Employment Guarantee Scheme
MLA	: Minister of Legislative Assembly
MM-II	Mini-Mission II
MNL	: Multinational Logistic
MSL	: Mean Sea Level
MT	: Metric Tonne
NA	: Not Available
NCERT	: National Council of Educational Research and Training
NE	: North East
NEDP	: New Economic Development Policy
NFSM-OP	: National Food Security Mission – Oil Palm

NGO	: Non-Governmental Organisation
NIFOR	: Nigerian Institute for Oil Palm Research
NLUP	: New Land Use Policy
NMEO-OP	: National Mission on Edible Oils-Oil Palm
NMOOP	: National Mission on Oilseeds and Oil Palm
NREGS	: National Rural Employment Guarantee Scheme
NSC	: National Seeds Corporation
NSO	: National Statistical Office
OIL	: Oil India Limited
OLS	: Ordinary Least Squares
OPAE	: Oil Palm Area Expansion
OPDP	: Oil Palm Development Programme
PMC	: Project Management Committee
PPP	: Public Private Partnership
PSM	: Propensity Score Matching
PWD	: Public Works Department
REDD	: Reducing Emissions from Deforestation and Forest Degradation
RKVY	: Rasthrya Khrishi Vikash Yojana
RSPO	: Roundtable on Sustainable Palm Oil
SAU	: State Agricultural Universities

SD	: Standard Deviation
SDG	: Sustainable Development Goals
SFCL	: States Farms Corporation of India Limited
SPOPP	: Sustainable Palm Oil Production Programme
SPSS	: Statistical Package for Social Sciences
TE	: Technical Efficiency
TGR	: Technology Gap Ratios
TMO	: Technology Mission on Oilseeds
TMOP	: Technology Mission on Oilseeds and Pulses (India)
UNEP	: United Nations Environment Programme
US	: United States
USAID	: United States Agency for International Development
USDA	: U.S. Department of Agriculture
VAT	: Value Added Tax
VC	: Village Council
WRC	: Wheat Research Centre
YG	: Yield Gap
YR	: Year

CHAPTER – 1

INTRODUCTION

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INTRODUCTION

1.1 Background

Contract farming is a system of farming, in which agro-processing or trading units enter into a contract with farmers to purchase a specified quantity of any agricultural commodity at a pre-agreed price. Singh (2002) claims that contract farming consists of four elements: a pre-determined price, quality standards, amount or acreage, and time. Contracts outline the costs and quantities of the commodity produced before harvest, as well as other production-related information. Will (2015) defines "contract farming" as an upfront agreement that outline the responsibilities of farmers and buyers as business partners. The Japanese government first implemented contract farming in Taiwan in 1895 (KhetiGaadi, 2022).

Contracts can be advantageous because they lower the risks associated with marketing and procurement for both the corporation and the farmer (Eaton & Shepherd, 2001). Contract farming may involve market provision, resource provision, and management specification. It has the potential to solve a number of conventional problems, including fragmented holdings, a long chain of market middlemen, producers' ignorance of buyers' needs, low farm mechanisation, inadequate finance and farmer distress sales (Ministry of Agriculture & Farmers' Welfare, 2017). It can also help in scaling up the economy, reducing transaction costs and vertical integration in the farming system. Contract farming was cited in the World Bank's "Berg Report" of 1981 as a potential strategy for reviving the agricultural industry (Little and Watts, 1994).

The contracts can be of three different types: (i) procurement contracts, where only the terms of sale and purchase are specified; (ii) partial contracts, where only a portion of the farm's inputs are provided by the contracting company and produce is purchased at pre-agreed prices; and (iii) total contracts, where the contracting

company manages all of the farm's inputs and the farmer is reduced to providing only land and labour (Swain et al, 2012).

Eaton & Shepard (2001) specifies five main categories of contract farming: centralised model, nucleus estate model, multipartite model, informal model, and intermediary model. The number of benefits and drawbacks of contract farming are identified by various researchers. Benefits to the farmers include provision for better inputs and production services, easy access to credit, application of better technology, improvement in skills of the farmer, guaranteed pricing system, easy access to reliable market, etc. The possible advantages for the sponsors may be political acceptability, overcoming barriers on land restrictions, production consistency, shared risk and quality assurance. However, there are several disadvantages to the contract farming system. Farmers may face increased risk, crop incongruity due to outdated equipment and crop specifications, manipulation of quotas and quality requirements, corruption, etc. The sponsors of contract farming may face issues such as limited land availability, social and cultural restrictions, farmer discontent, low-quality agro-inputs, sales of crops by farmers outside of the terms of the contract, etc.

According to Setboonsarng et al. (2006), there are lots of "potential benefits of contract farming" for the farmers and the purchasers.

The benefits for the farmers are as mentioned below-

1) *Access to Market*: Contract farming agreements connect farmers to far-off markets where crop demand and prices are more favourable.
2) *Access to Credit*: Buyers provide credit to farmers in the form of cash or in-kind inputs like seeds. Banks may accept the contracts as security in circumstances where buyers do not offer loans to farmers.
3) *Access to technology and skill development*: Contract farming agreements may make it easier to implement new production methods and additional steps to improve agricultural commodities. These include instruction and support for managing soil and water resources, growing crops, and keeping track of inputs and outputs.

4) *Access to Inputs*: Buyers may take steps to guarantee that contracted producers have timely access to inputs like seeds and fertilisers, in addition to providing support for training and observing best crop husbandry practises.

5) *Increased income*: Contract farming can result in better revenue, particularly when it is used for non-traditional crops that fetch a higher price.

6) *Reduced price risk*: Contract farming often involves contract negotiations at the start of the growing season, during which a predefined price for the product is negotiated. This could save farmers from suffering sales declines brought on by price swings.

7) *Reduced production risk*: Contract farming arrangements make it easier to share the risk of production failures brought on by unforeseen events like bad weather or disease.

At the same time it is also beneficial for the purchasers in the following ways-

i. *Control over Volume and consistency*: Contract farming guarantees suppliers that the necessary crops can be reliably supplied. For some types of crops, contract farming may lead to higher yields and better quality.

ii. *Improved cost effectiveness*: By avoiding land purchases and direct labour hires, contract farming enables businesses to save expenditures. Contract farming can assist businesses in reducing supervision costs, which are typically incurred as a result of standard principal-agent issues.

1.2 Contract Farming in India

Contract farming has existed in India since the time of the East India Company, when opium and indigo cultivation were first introduced by Europeans to the Bengal region. Some of the milestones in the development of contract farming in India were Indian Tobacco Company's (ITC) agreements with farmers in Andhra Pradesh for the production of Virginia tobacco in the 1920s, PepsiCo's contract farming for the production of vegetables, particularly tomatoes and potatoes in Hosiarpur Taluk of Rajasthan in 1927, the emergence of seed companies in the

1960s, the green revolution in the 1970s, and tomato farming agreements in Punjab in the 1990s by PepsiCo.

Several cash crops, including tea, coffee, rubber, indigo, and others, were introduced throughout the country, primarily through a central estate surrounded by small out-growers. Since the green revolution, the central government has implemented the largest contract farming model. Through this model, it has subsidised fertilisers, offered new hybrid variety seeds, provided training, and also guaranteed the procurement by state agencies with a minimum support price.

The Model Agricultural Produce Marketing (Regulation) Act, which the central government circulated to the states in 2003 for the purpose of implementing marketing reforms, contains provisions for the registration of contract farming sponsors, the recording of contract farming agreements with the Agricultural Produce Marketing Committee (APMC) or another authority specified by the Act, the protection of farmers' title or rights to their land under such contracts, a mechanism for resolving disputes and more. A set of Model APMC Regulations have also been circulated by the Ministry of Agriculture to help states in formulation of rules and for adoption in this regard. In order to create a legal basis for contracts, various state governments have recently added relevant portions to their individual APMC Acts. With few exceptions like Punjab where the state is actively involved in parts of the contracts, contract farming by corporate sector has so far primarily included buyback and input supply (Ray et al., 2020).

1.3 India’s Edible Oil Requirement

In its various agro-climatic zones, India is blessed with a large variety of oilseed crops. The main traditionally grown oilseeds include castor, niger seed, rapeseed, mustard, groundnut and linseed. In recent years, soy beans and sunflowers have also grown in prominence. Coconut is one of the most important crops. In addition to Kerala and the Andaman & Nicobar Islands, efforts are being undertaken to cultivate oil palm in the states of Andhra Pradesh, Karnataka, Tamil Nadu, and the North-Eastern region of the country. Cottonseed oil and rice bran oil are the two most important non-conventional oils. Additionally, a large source of oils comes

from oilseeds with tree and forest origins, which are primarily found in tribal inhabited areas (Ministry of Consumer Affairs, Food and Public Distribution, 2022).

According to the reports of the Ministry of Agriculture, as shown in Table 1.1, during the period from 2010-11 to 2020-21, domestic production of edible oil was 1084.41 lakh tonnes while 1326.82 lakh tonnes was imported, which means only around 45% of the edible oil requirement in India had been met from the domestic production and another 55% had been met from imports during the last decade.

Table 1.1: Edible oils in India (Qty. in lakh tonnes)

Oil Year (Nov.-Oct.)	Oilseeds* Production	Domestically available edible oil	Imports**	Total Edible Oils Available
2010-11	324.79	97.82	72.42	170.24
2011-12	297.98	89.57	99.43	189
2012-13	309.43	92.19	106.05	198.24
2013-14	328.79	100.8	109.76	210.56
2014-15	266.75	89.78	127.31	217.09
2015-16	252.5	86.3	148.5	234.8
2016-17	312.76	100.99	153.17	254.16
2017-18	314.59	103.8	145.92	249.72
2018-19	315.22	103.52	155.7	259.22
2019-20	332.19	106.55	134.16	240.71
2020-21#	365.65	113.09	74.40 (Nov-May 21)	-
Total	**3420.65**	**1084.41**	**1326.82**	

* Ministry of Agriculture
** DG of CI&S (Ministry of Commerce)
# Calculation based on 3rd Adv. Estimates (MoA on 25.05.2021).

Jadhav (2022) stated that the Ministry of Consumer Affairs admits that domestic production of edible oils is unable to meet domestic demand. While just 111.6 lakh tonnes of edible oils are produced domestically, the country consumes about 250 lakh tonnes annually. Approximately 56% of the supply-demand gap for edible oils is filled by imports as could be seen in Table 1.2.

Table 1.2*:* Edible Oils Imports of India (Quantity in lakh tonnes)

Items	Year		
	2018-19	2019-20	2020-21
Crude Palm Oil	65.41	68.15	74.66
RBD Palmolein	27.99	4.3	8.48
Palm Oil Total	93.4	72.45	83.14
Crude Soyabean	31.16	33.68	28.91
Crude Sunflower	23.46	25.26	19.09
Crude Rapeseed	0.64	0.17	0.52
Crude Palm Kernel	1.16	0.68	0
Others	5.42	1.35	2.86

Source: Lok Sabha (as mentioned in Businessline, March 7,2022)

1.3.1 Oil Palm Cultivation to meet Domestic Edible Oil Requirement

Oil palm was first introduced in the country as an ornamental plants in the National Botanical Gardens, Kolkatta in 1886. African *dura* palm was introduced along the canal bunds, home garden and in forest of Pune by the Maharashtra Association for Cultivation of Sciences (MACS) in 1947 to 1959. Kerala established oil palm research station in 1959 and Plantation Corporation of Kerala ltd. (later Oil Palm India Ltd.) launched large scale plantation from 1971 to 1984. Ministry of Agriculture prepared project for oil palm over 2,400 hectare in 1976. Andaman and Nicobar Islands launched plantations during 1971 to 1985.

Realising the potential of oil palm for self-sufficiency in edible oil, the Central government started various oil palm development programme which were highlighted in the following paragraphs:

Technology Mission on Oilseeds (TMO): Launched in 1986, it was the first programme on oilseeds. The main goal was to boost oilseed yield and production in order to strengthen the nation's independence in this crucial industry. Since 1991–1992, Oil Palm Development Programme (OPDP), with a focus on area development in the states of Andhra Pradesh, Karnataka, Tamil Nadu, Orissa, Gujarat, and Goa, has been included within its ambit.

Integrated Scheme of Oilseeds, Pulses, Oil Palm & Maize (ISOPOM): The IXth Five Year Plan's Accelerated Maize Development Program, National Pulses Development Projects, Oilseeds Production Programme, and Technology Mission on Oilseeds were all reorganised in 2004–2005. With effect on April 1, 2004, ISOPOM is put into place as part of the Xth Five Year Plan and supports the growth of oil palm in 12 states: Andhra Pradesh, Karnataka, Kerala, Maharashtra, Gujarat, Goa, Tamil Nadu, Orissa, West Bengal, Mizoram, Assam and Tripura, and. Assam, Maharashtra, and West Bengal did not cultivate oil palms, though Maharashtra has since expanded its oil palm area, starting in 2010–11. Support is offered through ISOPOM for planting supplies, farming expenses, drip irrigation system installation, diesel pump sets, training, development of fallow land, and knowledge transfer through demonstration and publicity. The area under Oil Palm increased from 8585 hectares at the end of 1991-92 to 26178 hectares in 2008-09. Actual production of FFBs during 2008-09 is 355480.36 metric tonnes yielding around 59,007.40 metric tonnes of Crude palm Oil.

Oil Palm Area Expansion Programme (OPAE): In order to increase the production of palm oil by 2.5 to 3 lakh tonnes over the following five years, Rasthrya Khrishi Vikash Yojana (RKVY) has been implemented to bring an extra 60,000 hectares of land under oil palm cultivation. It is suggested that growers receive incentives for certain critical interventions, such as planting supplies, compensation for farmers' lost income during the gestation period, pump sets, drip irrigation systems, support for intercropping, vermin-compost pits, Integrated Nematode Management/Integrated Pest Management/fertigation/tree guards, and others. Through the state's Department of Agriculture, it is intended to give entrepreneurs a subsidy at 50% of the cost of processing equipment and plant, up to a maximum of Rs. 250.00 lakh per unit of 5MT/hr FFBs capacity. Andhra Pradesh has a proposed outlay of Rs. 19200.00 lakh, Karnataka has a proposed outlay of Rs. 3360.00 lakh, Tamil Nadu has a proposed outlay of Rs. 3360.00 lakh, Gujarat has a proposed outlay of Rs. 480.00 lakh, Orissa has a proposed outlay of Rs. 1776 lakh, Mizoram has a proposed outlay of Rs. 1840 lakh, Chhattisgarh has a proposed outlay of Rs. 48.00 lakh, Maharashtra has a proposed outlay of Rs. 96 lakh. The program's budget

will be used to fund interventions such as planting supplies, cultivation costs, drip system supply, intercropping, INM/IPM, vermi-compost, water harvesting/borewell, processing units, and Indian Council of Agricultural Research/State Agricultural universities (ICAR/SAUs). The target for area expansion for OPAE under RKVY are - Andhra Pradesh - 40000 ha with a budget of Rs. 6400.00 lakh; Karnataka - 7000 ha with Rs. 1120.00 lakh; Tamil Nadu - 7000 ha with Rs. 1120.00 lakh; Gujarat - 1000 ha with Rs. 160.00 lakh; Orissa - 3700 ha with Rs. 592.00 lakh and Mizoram - 1000 ha with Rs. 160.00 lakh.

National Mission on Oilseeds and Oil Palm (NMOOP): A budget of Rs. 3,507 crore has been allocated for its implementation during the XIIth Five Year Plan, which will begin in 2014–15. Its aims to increase production of traditional oilseeds and tree-borne oilseed. Under Mini-Mission II, an additional 1.25 lakh hectares of Oil Palm cultivation are desired, with wastelands being utilised as part of the area expansion strategy in the states, which will raise fresh fruit bunch output from 4927 kg per hectare to 15000 kg per hectare. Andhra Pradesh, Chattisgarh, Goa, Gujarat, Maharashtra, Mizoram, Karnataka, Kerala, Odisha, Tamil Nadu, Arunachal Pradesh, Assam, Bihar, Manipur, Meghalaya, Nagaland, Sikkim, Tripura, and West Bengal are the states covered under MM-II.

National Food Security Mission – Oil Palm: The MM-II (Oil palm) interventions consist of three main parts. i) Area Expansion, assistance for planting materials, maintenance, and cultivation are covered by the inputs component. ii) Costs associated with the intercropping of oil palm trees throughout their four-year gestation period, as well as the production inputs component, which includes drip irrigation, water gathering structures, diesel pumps, and vermicomposting units the creation of a new seed garden, equipment and tools, a special component for NE/hilly states/LW Areas to build roads and a new oil palm processing facility, and (iii) a component for technology transfer covering assistance for training farmers and officials, demonstrations at farmer's fields, need-based R&D projects on the plant, including the import of germplasm and infrastructure support for ICAR/SAU, training, local activities, publicity, and contingencies, monitoring, evaluation and operational including consultancy costs, etc. and exposure visits. It aims to cover an

additional area of about 4.20 lakh ha, which will be under oil palm cultivation by 2020.

National Mission on Edible Oils - Oil Palm: The Union Cabinet approved the launching of National Mission on Edible Oils – Oil Palm (NMEO-OP); it will give special focus on the North east region and the Andaman and Nicobar Islands. Enhancement of domestic production through increasing the area and productivity of oil palm is necessary to reduce the dependency on imports. The total outlay is Rs.11,040 crore, whereas the Government of India will share Rs.8,844 crore and the state share will be Rs.2,196 crore which will include the viability gap funding also. By 2025–26, it is planned to cover an additional 6.5 lakh hectares (ha.) of land for oil palm planting under this scheme, bringing the total area to 10 lakh hectares. Crude palm oil (CPO) production is anticipated to increase to 11.20 lakh tonnes by 2025–26 and to 28 lakh tonnes by 2029–30.

The state-wise potential area for oil palm cultivation in India was assessed by ICAR-IIOPR in 2020 and identified 27,99,086 hectares in 22 states, viz. Andhra Pradesh, Arunachal Pradesh, Assam, Andaman & Nicobar, Bihar, Chhattisgarh Gujarat, Goa Karnataka, Kerala, Odisha, Tamil Nadu, Telangana, Uttar Pradesh, Madhya Pradesh, Maharastra, Manipur, Meghalaya, Mizoram, Nagaland, , Tripura and West Bengal (MoA&FW, 2021).

1.4 Oil Palm Contract Farming in Mizoram

Mizoram is having sub-tropical climate and the geo-climatic condition is found to be suitable for oil palm cultivation. Initially, an area of 61,000 hectares was identified as an Oil palm potential area in the state by a high level committee headed by Dr. K. L. Chadha and later Dr. P. Rathinam Committee identified an area of 40,000 hectares as potential area. The total potential area identified was 101,000 hectares in the state. However, the potential area was re-assessed in the year 2020 and 66,791 ha was considered potential area for oil palm cultivation (Department of Agriculture, Govt. of Mizoram, n.d.).

Oil palm cultivation was started in the year 1999 on an experimental basis in Rotlang, Lunglei District and Thingdawl, Kolasib District and found to be feasible. The Mizoram State Legislative Assembly had passed the Mizoram Oil Palm (Regulation of Production & Processing) Act, 2004 on the 2nd December, 2004. The

Act provides for a contract system in which the contracting firm will be responsible for seed supply and purchase of the fresh fruit bunches. Under the Oil Palm Act, the state government signed MoU with the three companies Godrej Agrovet Pvt. Ltd. for Kolasib & Mamit districts, Ruchi Soya Industries Ltd. (presently Patanjali Foods Ltd.) for Lunglei and Lawngtlai districts and 3F Oil Palm Agrotech Pvt. Ltd. (withdrawn from the MoU) for Aizawl, Serchhip and Kolasib district.

Oil palm cultivation in Mizoram has been taken up by the Department of Agriculture and Farmers' Welfare. Various oil palm development programmes of the government of India are being implemented, such as, Integrated Scheme of Oil Seeds, Pulses, Oil Palm and Maize (ISOPOM) since 2005-06; Rashtriya Krishi Vikas Yojana (RKVY for Oil Palm Area Expansion) since 2011-12; National Mission on Oilseeds and Oil Palm (NMOOP) since 2014-15; National Food Security Mission – Oil Palm (NFSM-OP) since 2018-19 and the National Mission on Edible Oils-Oil Palm since 2021-22.

Mizoram is having a potential area of 66,791 hectares in seven districts, out of which 26,680 hectare have been cultivated by 10,843 farmers spreading across 197 villages of the seven districts. The total fresh fruit bunches sold till July, 2021 was 37,272.822 metric tonnes.

1.5 District-Wise Potential and Cultivated Areas

In terms of area coverage in hectares, Siaha district is having the minimum area (86 ha or 4.3%) followed by Aizawl district (859 ha or 7.7%) and Serchhip district (2,130 ha or 23.7%). Kolasib district is having the largest cultivated area (6965 or 49.3%) followed by Lunglei district (6396 ha or 64%), Mamit district (5780 ha or 42.8%) and Lawngtlai (4464 ha or 63.8%) as shown in Figure 1.1.

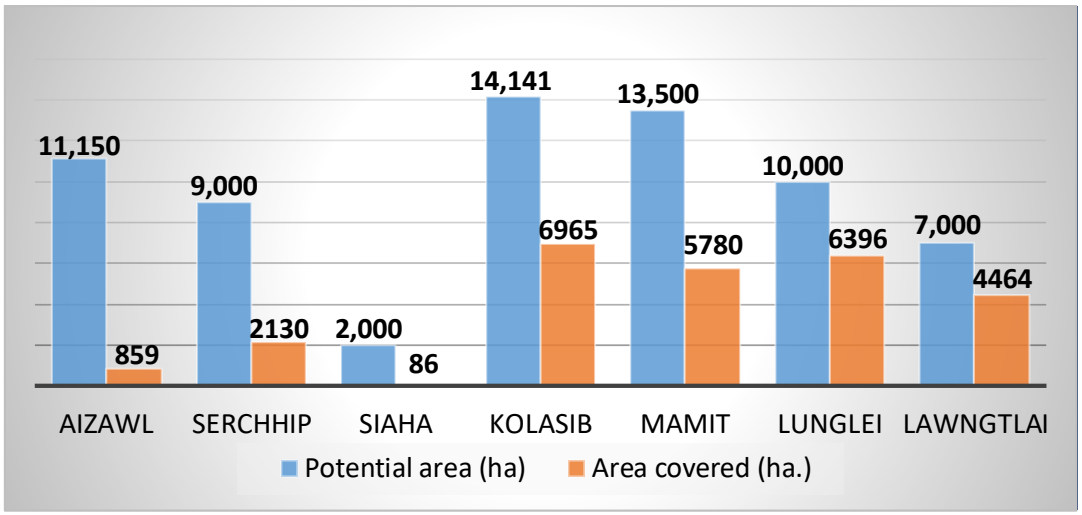

Figure 1.1: Oil palm cultivation area in Mizoram (till July, 2021)
Source: Department of Agriculture, Govt. of Mizoram

1.5.1 Sponsor-wise area coverage under oil palm cultivation:

The area coverage under the three contracting firms are given in Figure 1.2 showing percentage cultivated area to the potential area in their respective allocated districts for Godrej Agrovet Ltd. (46.11%), Ruchi Soya/Patanjali Foods Ltd. (63.88%) and 3F Oil Palm (13.88%). However, the area covered by Godrej Agrovet Ltd. in absolute measure is larger by 1885 ha. The total area covered by the three companies made up roughly 40% of the total potential area.

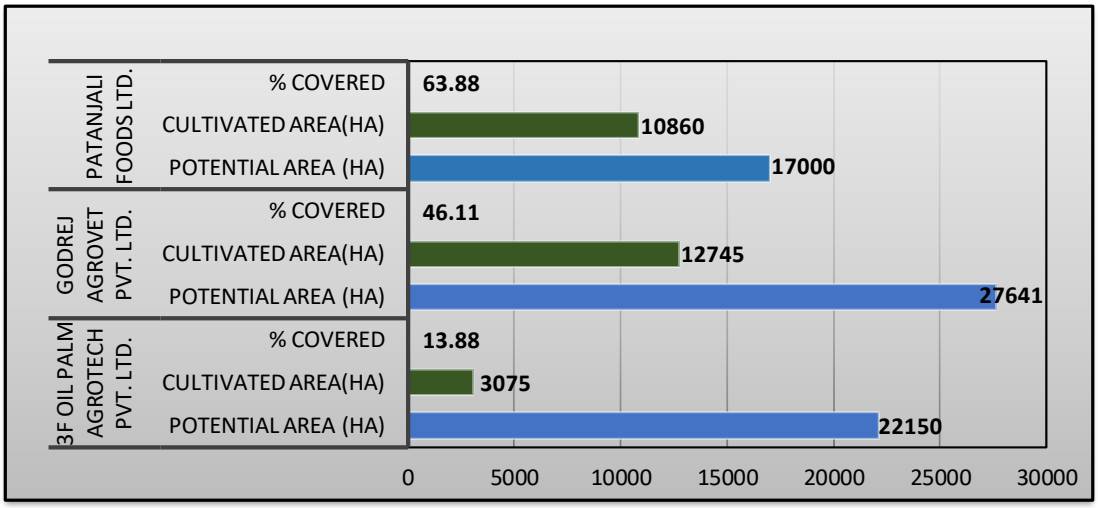

Figure 1.2: Area covered under the contracting firms (till July, 2021)
Source: Department of Agriculture, Govt. of Mizoram

1.6 Significance of the Study

Contract farming system is now practiced in the state of Mizoram, just as in other states across the nation. However, many farmers still adhere to informal contracts or marketing channels. The state's contract farming system is still in its nascent state, needing much nurturing and monitoring. The Mizoram Oil Palm (Regulation of Production & Processing) Act, 2004, was passed in the Mizoram Legislative Assembly on December 2, 2004, and the government signed memorandum of understanding (MoU) with three companies in the years 2005 and 2006.

Oil palm cultivation was taken up in the state involving the government, the companies and the farmers on Public Private Partnership (PPP) mode. Considering the production and the productivity of oil palm farmers in Mizoram, it is clear that the performance needs to be improved. The weaknesses in the process resulting in the low productivity need to be addressed in order to fulfil the vision of the Government of India to attain self-sufficiency (*aatmanirbharata*) in edible oils. In addition, there is a paucity of literature in this area pertaining to Mizoram, so it is necessary to present trustworthy research-based information in order to give suggestions for improvement of the programme and to attain economies of scale. In light of this context, the study makes an effort to evaluate the status and operations of the state's current contract farming system. This study will offer policy inputs for contract farming, not only of oil palm but also other crops.

1.7 Area of the Study

The present study pertains to the oil palm contract farming in the state of Mizoram. There were three oil palm companies which have signed MoU with the state government. Oil palm was cultivated in seven districts out of the erstwhile eight districts, viz. Aizawl, Lunglei, Kolasib, Lawngtlai, Mamit, Serchhip and Siaha. The study covers four districts, viz. Kolasib & Mamit (Godrej Agrovet Ltd.), Lunglei (Ruchi Soya Industries Ltd./Patanjali Foods Ltd.) and Serchhip (3F Oil Palm Agrotech Pvt. Ltd.).

Ruchi Soya Industries Ltd. had been acquired by Patanjali Ayurved for Rs 4,350 crore through an insolvency process. Accordingly, the name of the company stands changed from Ruchi Soya Industries Ltd to Patanjali Foods Ltd with effect from June 24, 2022 (ET, June, 2022). Now, therefore, Ruchi Soya Industries Ltd. will be called Patanjali Foods Ltd., hereafter. Earlier, 3F Oil Palm Agrotech Pvt. Ltd. had also withdrawn from the contract and Department of Agriculture, Government of Mizoram is taking care of the farmers within their areas of operation.

Mizoram has oil palm potential area of 66,791 hectares as per the assessment made in 2020. The present study is covering four districts, having total potential area of 46,641 hectares which is around 70% of the total potential area of the state. In terms of number of farmers, the study area is having 77.38% of the total oil palm farmers and the area cultivated is 81.41% of the total cultivated area of the state. The four districts shared 93.8% of the total FFB sold till July, 2021. Out of 197 villages cultivating oil palm, the study district covers 135 villages which is 68.53% of the villages covered under oil palm cultivation. Therefore, the four districts, viz. Kolasib, Mamit, Serchhip and Lunglei are considered to be appropriately representing the case of Mizoram with the involvement of all the three companies dealing with the promotion of oil palm cultivation in the state.

1.8 Objectives of the Study

The primary objective of the study is to determine the present status and performance of contract farming in Mizoram. The specific objectives are:

i. To examine the socio-economic profile of oil palm contract growers.
ii. To identify the inputs (material and technical) provided to the farmers.
iii. To analyse the performance of the contract farmers to comply with contract requirements.
iv. To assess the performance of contracting firms in the delivery of materials and services.
v. To evaluate the operational and institutional constraints for the success of contract farming.

1.9 Research Hypotheses

The following hypotheses are proposed to be tested:

1. Socio-economic conditions of the oil palm contract farmers do not have significant impact on the quantity of the fresh fruit bunch (FFB) production.
2. Trainings provided to the farmers does not have significant impact on the production of FFB.
3. Trainings provided to the farmers does not have significant impact on the productivity of FFB
4. There is no significant difference on production of FFB among the contract farmers under the selected 3 companies.
5. There is no significant difference on productivity of FFB among the contract farmers under the selected 3 companies.
6. Contract farming does not result in significant improvement in the productivity of the contract farmers.
7. There is no significant effect of the farm's accessibility to the FFB production of the contract farmers.

1.10 Research Methodology

The study is exploratory as well as quantitative in nature.

1.10.1 Sources of Data

Primary data as well as the secondary data were used to study the performance of oil palm contract growers and the parties involved. Primary data were collected by conducting sample surveys using structured interview schedule and focussed group discussion during 2019. Secondary data were collected from sources like official publications, Directorate of Economics & Statistics, Agriculture Department, Ruchi Soya Ltd./Patanjali Foods Ltd. and Oil Palm Mill (Godrej Agrovet Ltd.). Secondary sources like journals, articles, academic literatures, published and unpublished research works in the field were also consulted.

1.10.2 Sample Size & Selection

According to the record of the Agriculture Department, oil palm is being cultivated in 197 villages of 7 (seven) districts and the total number of oil palm farmers in the state is 10,843. However, among the 3 (three) contracting firms, only Godrej Agrovet Ltd. (Kolasib & Mamit) have established a palm oil mill at Bukvannei, Kolasib District, whereas, 3F Oil Palm Agrotech Pvt. Ltd. (Aizawl, Serchhip & Saiha) and Patanjali Foods Ltd. (Lunglei & Lawngtlai) have not yet established a palm oil mill.

Taking 95 percent confidence level out of the total population of 10843 requires a minimum sample size of 372. Multi-stage sampling method was adopted to arrive at the desired number of samples. In the 1st stage, 2 (two) districts each were selected on the basis of: i) districts under firms who have established palm oil mills and ii) districts under firms who have not yet established palm oil mills. One district each with maximum number of village coverage under the two firms viz. 3F Oil Palm Agrotech Pvt. Ltd. and Patanjali Foods Ltd. were again selected. Hence, total number of districts covered was 4 (four). In the 2nd stage, the number of villages from each district were determined by proportionate sampling method, while taking the sample farmers per village as 20 (twenty). In order to cover 380 (three hundred eighty) farmers, we need 19 villages. Number of villages in each selected district divided by total number of villages in the four districts (*135*) and multiplied by total sample villages (*19*); and by rounding of the number, arriving at the proportionate number of villages per district as given in Table 1.3.

Table 1.3: Sample Size & Selection Process

Company	District	No. of villages covered	Selected district & no. of villages	No. of selected villages from each district	No. of samples per village	Total samples
Godrej Agrovet Pvt. Ltd. (Mill established)	Kolasib	29	29	4	20	**80**
	Mamit	42	42	6	20	**120**
3 F Oil Palm Agrotech Pvt. Ltd. (Mill not established)	Aizawl	6	-	-	-	**-**
	Serchhip	15	15	2	20	**40**
	Saiha	10	-	-	-	**-**
Patanjali Foods Ltd. (Mill not established)	Lunglei	49	49	7	20	**140**
	Lawngtlai	46	-	-	-	
Total		**197**	**135**	**19**	**20**	**380**

1.10.3 Evaluation of Status of Contract Farming:

During the survey, relevant data pertaining to contract farming in the state was collected from the department of Agriculture, company representatives of Godrej Agrovet Ltd, and Ruchi Soya Industries Ltd. (Patanjali Foods) through interview schedules as well as verbal communication. Their performance and problems faced were discussed during verbal communication. However, representatives of the 3F Oil Palm Agrotech Pvt. Ltd. could not be met as the company had already withdrawn from the contract agreement. Data from the farmers were collected using interview schedules on various parameters concerning the socio-economic conditions; ownership of land; cultivation practice; assistance received; training attended; income from oil palm and other sources; cost of cultivation; problems faced and the problems being encountered.

1.10.4 Data Analyses:

The data collected were analysed using simple statistical measures like percentage, mean and standard deviation to give answers to the research questions. The socio-economic conditions of the farmers, the availability of materials and services, cultivation and production of fresh fruit bunches (FFB), problems encountered by the farmers, their general perceptions, etc. were analysed. To prove some hypothetical cases, t-test, z-test, ANOVA and regression analysis were employed.

1.11 Chapterisation

The present study is organised into 6 chapters as follows:

Chapter 1: Introduction

This chapter deals with a brief background of contract farming, contract farming in India, India's edible oil requirement and contract farming, oil palm contract farming in Mizoram, significance of the study, area of the study, objectives of the study, research hypotheses, research methodology and limitations of the study.

Chapter 2: Review of Literature

This chapter contains the meaning of contract farming, various types of contract farming models, literatures regarding contract farming and literatures related to contract farming with respect to oil palm.

Chapter 3: Overview of Contract Farming in India

The components of this chapter deals with the historical background of contract farming in India, the expansion of contract farming after Independence, various literatures regarding contract farming in India.

Chapter 4: Institutional Settings of Contract Farming in Mizoram

This chapter gives a brief information about the state of Mizoram, brief information on oil palm development programmes in India, oil palm potential area in Mizoram and the introduction of oil palm cultivation under contract farming system in the state. Institutional setting with various Committees formed for the development of oil palm cultivation in the state are given in this chapter.

Chapter 5: Analysis of Oil Palm Production and Supply Chain Status

This chapter deals with the cultivation of oil palm in Mizoram and analyses palm oil supply chains, performance of the sponsors/contracting firms, performance of the oil palm contract farmers, costs and benefits of oil palm cultivation, problems faced by the farmers and comments of the farmers.

Chapter 6: Findings, Conclusion and Suggestions

This chapter consists of the major findings in relation to the study objectives and hypotheses. Conclusion of the study and suggestions are also presented in this chapter.

CHAPTER – 2

REVIEW OF LITERATURE

CHAPTER 2
REVIEW OF LITERATURE

Contract farming involves an agreement between the farmer and the buyer for agricultural production with pre-agreed price of specific products at an agreed quantity and quality in a stipulated time. Sometimes, the buyer provides technical inputs. It could be formal or informal agreement signed between the farmer/producer and the buyer/processor. The present chapter deals with the literatures on the models, types, advantages, disadvantages and value chains in contract farming.

Eaton and Shepherd (2001) identified five types of contract farming models,

a. Centralized model, where the contracting company gives support to smallholders in production, purchases the produce and process it. it demands quality of the produce;
b. Nucleus Estate Model, where the company manages a plantation to supplement the production of the small holders and minimal amount for the processing plant;
c. Multipartite model involving partnership between government bodies, private entrepreneurs and farmers;
d. Intermediary model involves subcontracting by processors to middlemen, who can have formal or less-formal arrangement with the farmers or traders and finally,
e. Informal model entail small and medium enterprises making simple periodic contracts with producers.

Mighell and Jones (1963) devised a traditional typology of agricultural contracts, dividing them into three categories: contracts that specify the market, contracts that govern production, and contracts that provide resources. These agreements differ in terms of their primary goals, the delegation of decision-making authority and the transfer of risks.

i. *Market-specification (or marketing) contract* is an agreement made before the harvest regarding the terms governing the sale of the product between producers and contractors. These factors affect the quality of the product as well as the timing and location of sales, which has an impact on some of the

farmer's production choices. The producer is less likely to have trouble finding a market for the harvest as contractor ensure the market. The farmer retains majority of the decision-making authority over his farming operations and, consequently, his farm assets under the market-specification contract. Majority of the risk rests with the farmer.

ii. *Production-management contract* offers the contractor more control than a market specification contract because the contractor will oversee production procedures and dictate how inputs are used. Producers agree to adhere to specific production practices and input application under this kind of contract. In such a situation, farmer has given up a significant portion of his decision-making authority over cultivation and harvesting procedures.

iii. *Resource-providing contract* is a type of farming where the contractor provides both a market outlet for the product and crucial inputs. Inputs are a form of in-kind credit, the cost of which is repaid after the product is delivered. Contracts for the provision of resources can include production management, which transfers the majority of decision-rights and risks to the contractor, or they can only be focused on providing inputs and an output market, which leaves the farmer in charge of the majority of production decisions and a sizable portion of the risk.

Contract farming has been widely practiced in various parts of the world with wide variation in practices. It is a good tool for production of desired quality in desired quantity of valued agricultural products. While contract farming is a good instrument for developing the small and marginal farmers by giving them a chance to participate in the modern commercial agriculture, it is also having many challenges.

There are various advantages and disadvantages of contract farming which had been found by researchers. Contract farming, on the one hand, is attractive to contractors for guaranteeing consistent and of high-quality produce. On the other hand, many smallholder farmers have begun to find the usage of agricultural contracts to be interesting because the arrangement can ensure a steady income and access to dependable markets in the contemporary food supply chain. However, there are a number of possible risks associated with implementation of contracting

programmes that could result in failure to uphold the agreement on the part of both parties, whether they be farmers or contractors (Prowse, 2012).

The present chapter will deal with the literature review on contract farming practices and will specifically deal with oil palm cultivation in the sub section.

2.1 Contract Farming Practices

Sänger (2012) in his study 'On small farms and the design of contracts in agricultural markets – Experimental evidence from Vietnam' found that the initial investment cost presents a great difficulty for many smallholders, making larger farmers more likely to sign contracts. Due to scale effects, costs rising from repeated transactions are lower for buying firms when dealing with larger farmers. These two important factors may limit participation of small-scale farmers in emerging high-value markets. Indeed, empirical evidence on inclusion of smallholders is mixed. Buying firms seem to oftentimes prefer contracting larger farmers.

Bolwig (2012) in his study of organic contract farming in Uganda found that contract farming results in improved food security as higher revenues from certified organic crops enhanced households' capacity to access food through the market.

Sokchea and Culas (2015) in their study "Impact of Contract Farming with Farmer Organizations on Farmers' Income: A Case Study of Reasmey Stung Sen Agricultural Development Cooperative in Cambodia" investigated the impact of contract farming on farmers' income. They used ordinary least squares (OLS) model for assessing impact of contract farming on income and Probit model for reasons for participation in contract farming. By employing treatment effects model, they found that contract farming with farmer organizations significantly raises farmers' income. In general, contract farming ensures market for produce, whereas farmer groups lower the cost of running a farm and provide farmers more negotiating leverage, which leads to higher profitability for farmers. According to the econometric model and qualitative data, contract farming can lead to an improvement in farming production, produce quality, and cost effectiveness.

James (2015) observed that contract farming may be quite exploitative, thus smallholders are instead opting in and out of these agreements based on their needs because they are acutely aware of the power disparities that exist between them and contract farming firms. However, the data indicates that a sizable portion of

Zimbabwe's small-scale farmers are increasingly turning to contract farming as a means of subsistence.

Musa et al. (2018) examined the efficiency of contract farming in the commercialization of small-scale vegetable farmers in the Sarah Baartman district municipality of South Africa's Eastern Cape region. Data on the agricultural issues present in the parties' contract farming relationships were collected through focus groups and in-depth interviews. The study found that there was a basic conflict of interest between agribusiness and farmers in the area under investigation's contract farming environment, which was extremely polarised. It is concluded that contract farming is ineffective as a development approach to connect small-scale farmers to profitable agricultural markets. Lack of high-quality seeds, trust, entrepreneurial abilities, and formal contract agreements were a few of the other major problems preventing contract farming engagement. The report suggests a collaborative relationship between the government and private businesses, with state assistance provided by updated policies and development initiatives. These changes are essential to improving small-scale vegetable farmers' participation in successful agri-food chains.

Ragasa et al. (2018) investigated the various maize-based CF programmes in Ghana's poorest and remotest region. Utilizing a special dataset at the plot level that covers two data periods and two maize plots (scheme and non-scheme) per household, it evaluates the viability and potential impact of these CF schemes. To address selection bias and unobserved heterogeneity among farmers, it uses matching techniques and an instrumental variable approach. These are supplemented by key informant interviews, in-depth interviews with scheme operators, and a community-level survey. The outcomes demonstrate that these plans boosted technology adoption and increased yield. Additionally, a fraction of maize farmers that participated in CF had substantial profits due to the large yield improvements. The use of maize CF programmes allowed for the regular delivery of high-quality maize to downstream businesses as well as market coordination.

However, even after accounting for input variation, the CF schemes generally have a negative effect on profitability. The yield increases are insufficient to offset the increasing input needs and capital costs. Despite better yields, the cost to produce

one metric tonne of maize under CF systems is more than on farms without CF schemes, twice as much as in some African countries, and more than seven times as much as in the major maize exporting nations (the United States, Brazil, and Argentina). The development and promotion of significantly better types and technologies will be crucial to the long-term viability of these CF programmes.

Dubbert (2019) in her study, "Involvement in Contract Farming and Farm Performance: Insights from Cashew Farmers in Ghana," examines the factors that affect cashew farmers' decisions to join in CF as well as the effects of participation on farmers' performance. Switching regression model is used to compensate for selection bias brought on by observable and unobservable factors. The empirical findings demonstrate that taking part in CF has a significant positive impact on labour productivity, price margins, cashew yields, and net revenues. In comparison to medium- and large-sized farms, small cashew farms seem to gain more from CF, according to a disaggregated analysis of the sample by farm size groups.

Nhan and Yutaka (2019) in their study, “Contract Farming and Profitability: Evidence from Rice Crop in the Central Mekong Delta, Vietnam" used a farm-household survey data that included 96 non-contract respondents and 70 contract respondents, and they applied the Student's t-test and an ordinary least square regression model for data analysis. They found that contract farmers are less likely to have large rice plantations, and that contract producers typically have more guaranteed market outlets and output prices. When controlling for observable features of households and farms, the results show that contract farming has a considerably favourable influence on rice farming profitability in terms of average return and average rate of return on variable cost. The findings imply that contract farming might make it possible for rice farmers to increase both their rice income and household income. The policy impact may be that not all rice farmers and rice business firms will be able to engage in contract farming.

Benalywa et al. (2019) used capital budgeting approaches including Net Present Value, Internal Rate of Return, Profitability Index and Payback Period to assess the impact of government’s incentives on broiler contract farming in Johor under various technologies. Stratified sampling technique was used for selection of respondents from contract farming in two different cooping systems (open and

close). Data on cost of input, output and initial investment were collected. The outcome proved that contract broiler farming was generally profitable. Utilizing closed technology has the potential to boost profits while lowering business risk. Government tax incentives considerably improved the viability of broiler farming.

Adnan et al. (2019) uses bivariate and multinomial probit models to analyse farmers' decisions to embrace risk management instruments (contract farming and precautionary savings) and to look into the effects of various factors on farmers' risk management choices. 350 farmers were selected for the study by multistage stratified random selection techniques, which were used in four different agro-ecological zones of Bangladesh. According to the research, farmers' decisions to use risk management tools are interrelated, and the use of one risk management tool may prompt farmers to use another at that time. The results also showed that most farmers are naturally risk-averse and that age, education, income, and land ownership are the main factors determining the use of risk management methods.

Bidzakin et al. (2019) examined the importance of CF in the production of rice. 350 rice farmers were randomly chosen from Ghana's rice production regions to obtain cross-sectional farm household level data. Endogenous switching regression and propensity score matching techniques were used to evaluate the adoption and casual impact of CF. Results showed a favourable and strong correlation between CF and agricultural performance indicators (yield and gross margins). CF greatly raises yield and gross profits. Educational attainment, rice farm size, and integrated soil fertility management (ISFM) are contributing factors to contract participation. The study supports programmes intended to promote CF in Ghana. They suggested that focus of contract farming should be on educated farmers due to their high possibility of participating in CF and illiterate farmers should also be encouraged to engage in CF. In order to boost the use of ISFM technology, CF should also be supported and it is suggested that CF be used to build Ghana's regional rice value chain.

Harish (2019a), examines the issues and limitations that Karnataka state farmers who engage in contract farming confront. Due to the guaranteed prices for crops and markets provided by contract farming, respondents' income increased once they joined. It is also discovered that contract farmers' investment practises have

improved, yet contract farmers still face challenges and limitations when engaging in contract farming.

Harish (2019b), in his study, "Impact of Contract Farming on Economic Status of the Farmers Practicing Contract Farming" conducted in two districts of Karnataka state viz., Bangalore Rural and Tumakuru found that the annual income, investment returns, and material possessions were higher after joining contract than before joining contract farming. He came to the conclusion that contract farming helps to raise the farmers' standard of living.

Tekalign (2019) in "Contract Farming in Sub-Saharan Africa: An Empirical Review" supports proponents of contract farming who claim that it frequently increases the income of small-scale farmers by giving access to credit, technical information, and specialised inputs, while occasionally lowering farm-level risk. The argument that contract farming may favour medium-scale producers over small-scale farmers has some merit, albeit it relies on the particular conditions and the policy context. Additionally, he asserted that farmers' side-selling and the company's refusal to pay the agreed-upon price are the most prevalent issues. Failures of contracts were also frequently caused by the high cost of working with so many small farmers. The introduction of contract farming programmes, particularly those involving small-scale farmers, should be encouraged by government policy.

Kusnadia and Paramitab (2019) studied contractual arrangements of different types increasingly found in West Sumatra not only in subsistence and commercial crops but particularly also in livestock sector. Within this broad definition, there are different variants of contracts depending on the formality and intensity of contractual arrangement. This study objective was to prove that the design of a contract, as representation of vertical integration intensity in broiler agribusiness, has different efficiency effects on production. The stochastic frontier production function was used in this study, and employed a regression method to estimate the level of technical efficiency. The results shows that farm experience and improvement of the contract system would reduce the level of technical inefficiency of broiler farms. The study concluded that broiler farms under formal and detail contract farming had greater technical efficiencies compared to broiler farms under informal unwritten

contract arrangement. However, the broiler farms under informal contract obtained higher net returns compared to the broiler farms under formal contract arrangement.

Anh et al. (2019) use multinomial logistic (MNL) regression to analyse the factors that affect smallholder farmers' decisions about various contract farming schemes. According to the study, there are many production contract typologies, such as the informal model, intermediary model, and nucleus estate model. Gender, farm size, input provision, price option, technical help, delivery schedule, and monitoring are significant variables that influence smallholders' preferences for various contract farming methods. In the nucleus estate model, farmer overdependence and the monopolistic strength of industrial coffee corporations, as well as information asymmetry in the informal model, are the main problems that cause contract farming failures. A cost-benefit analysis symbolising the cooperative's function in the intermediate model is crucial for enhancing outcomes that benefit both industrial coffee companies and smallholder growers.

Bezabeh et al. (2020) studied the variables that affect farmers' involvement in malt barley contract farming and the West Arsi zones of Ethiopia's Oromia region. Probit model results shows that age, livestock ownership, finance availability, distance to the primary market, and cooperative membership all exhibited positive and significant effects on decision-making regarding contract farming involvement. The effect of contract farming on farm households' income was calculated using the propensity score matching method and was found that it led to an increase in annual gross farm revenue for contract, which is 27.30% more than the annual gross income of households on non-contract malt barley farms. The results of this study show that contract farming can boost farm households' income, which policy makers and other concerned organisations may take into consideration as an alternative strategy for rural development as long as it is adjusted to local conditions.

Olounlade et al. (2020) looked into how contract farming involvement affected smallholder farmers' income and food security in the Northern Benin rice crop production. Propensity score matching (PSM) and the local average treatment impact parameter are combined to correct observed and unobserved biases (LATE). The outcomes demonstrated a strong negative impact of contract rice cultivation. They discovered evidence of considerable adverse impacts at a 1% level on rice

production income. The income of the rice farms decreased as more farmers began to practise contract farming. Potential participants who participated in contract farming also had decreased food consumption, with a score of 60.64, putting their households at the food security status level of poor food consumption due to insufficient food consumption in terms of both quantity and nutritional quality. Therefore, if farmers in the Alibori Department of Benin do not diversify their crops, contract farming is not a sensible policy instrument that can assist farmers boost their income and enhance their level of food security. Contract farming cannot yet fully profit from its potential since the requisite resources and economic climate are not in place. In remote places with markets and other infrastructure, growing contract farming would not be acceptable to avoid wasting limited public resources. To maintain sustainability and the widespread participation of farmers, as well as to make contract farming lucrative for the parties involved, additional steps are required.

Rokhani et al. (2020) identified the determinants of farmers' participation in sugarcane contract farming in Indonesia by employing logistic regression. The result shows that farmer engagement in sugarcane CF is adversely impacted by age, education and kind of cultivated land. In contrast, farmer engagement in sugarcane CF is favourably influenced by land tenure, cultivated area, cropping system, certified seed, cooperative membership, access to extension services and membership in the farmer association. Intensifying CF information to farmers with broad cultivable areas is the policy implication for raising farmer engagement in CF.

Rondhi et al. (2020) in their study, "Asymmetric Information and Farmer's Participation in Tobacco Contract Farming" in Indonesia employing descriptive statistics and probit model for estimation for identification of correlates of farmers' participation in tobacco contract farming finds that asymetric information does exists in tobacco CF and can be minimized through intense monitoring and increased transparency, which could be minimised by entering into direct contracts. Younger farmers and those who own more land are also more likely to take part in CF. Additionally, there is a strong correlation between CF participation and increased farm income. They recommended that regulation which reduces the transaction costs associated with CF be given more attention in policies intended to promote CF.

Chingosho et al. (2020) studied the debt status of the tobacco small farmers in the province of Maniland in Zimbabwe and selected the samples of 381 smallholder farmers using convenient sampling method and collected data with structured interview questionnaires. The data collected was analysed using descriptive statistics and logistic regression analysis. Among the respondents, 74% were contract farmers and 26% were non-contract farmers. They found that 57% of the whole samples were in debt related to tobacco farming, the reason being that the smallholder farmers were exploited by the companies by paying less than the market rate for their produce while charging higher than the competitive market rate for the inputs. As many as 91% of the contract farmers prefer to become independent farmers while 63% of the independent farmers would like to join the contract farming. The study shows that tobacco farmers in the Maniland were rather victims than beneficiaries due to imbalanced bargaining power and suggested government intervention.

Ncube (2020) investigated the significance of contract farming to small-scale farmers in Africa and its policy implications. Utilizing secondary data, the study was qualitative in nature. According to the survey, there is growing interest in CF as a supply-chain governance technique as a result of changes in agri-food systems around the world. Small and medium-sized farmers in Africa have been shown to be inhibited by market bottlenecks or unfairness, such as limited access to lending facilities, insurance, and specialised agri-inputs at prices above average. He came to the conclusion that in order to safeguard both parties from potential contractual issues, such as side marketing, the Government and the private sector must develop contractual regulations to regulate agricultural production and marketing agreements between agribusinesses and farmers. He argued that when farmers have the negotiating power to negotiate the terms of the contract, contract farming produces the best results for them.

Luh (2020) in his study, "Inclusiveness of Contract Farming along the Modern Food Supply Chain: Empirical Evidence from Taiwan," aims to explain the inclusiveness of smallholders in contract farming by incorporating sales to supermarket and hypermarket chains as one of the determinants of contract farming participation. According to the findings, the influence of organised retailing on the involvement of contract farming in the contemporary supply chain varies with

different food retailers. Additionally, contracting companies in Taiwan are found to favour large-scale growers based on the probability anticipated by the participation-determining model. Participation in farmer organisations can successfully reduce the scale bias of contracting firms, according to further research on the relationship between growers' scale and membership in those organisations. The importance of farmer organisations' moderating impact indicates how crucial a part they played in integrating smallholder farmers into the contemporary food supply chain.

Mugwagwa et al. (2020), based on transaction cost theory, suggested an alternative typology for contract farming arrangements (CFA). They conducted a survey of managers of agribusiness companies and contracted farmers in Zimbabwe before creating the typology to better understand the clauses in their contracts, the reasons why they were included, and the degree of transaction attributes, particularly the sub-categories of asset specificity and uncertainty. Based on the interaction of transaction attributes, a two by two matrix of contract type was created. Four different contract types can be recognised, according to the findings: total, group, lean, and market contracts. CFAs that are not aligned with transaction attributes also struggle with side-selling issues and inefficiencies. The new, empirically based categorization can assist managers and policymakers in creating CFAs that are compatible with the fundamental characteristics of transactions, improving the stability and effectiveness of CFAs.

Solazzo et al. (2020) employed logit model to investigate the vertical relationships along the Italian durum wheat chain and the factors influencing farmers' behaviour in adopting contractual agreements. The goal is to identify factors that affect the likelihood of contract farming between farms and processors. The seldom use of written contracts between growers of durum wheat and downstream operators is one of the major issues currently being raised. Most often, farmers demonstrate a lack of trust in contracts thereby choosing to sell their goods to a nearby downstream business with which they have a strong, long-standing trust connection. Moreover, results of a logistic model show that certain farm features, such as turnover and degree of specialization in durum wheat production, play an important role in driving the decision to adopt written contract.

Herdiansyah et al. (2020) measured the possible significant differences between and within groups using ANOVA and Spearman's correlation matrix. This study finds that whereas good seed treatment and adequate doses of fertilizer are important for farmers' prosperity and productivity, it is not significant enough and a combination of other factors such as planting management practices, drainage capacity and soil substrate properties, climate characteristics, rainfall distribution, nutrient supply, and prevention of plant diseases also determining maximum yield.

Ruml and Qaim (2021) used quantitative and qualitative data from Ghana to demonstrate that smallholder farmers benefit from a resource-providing contract in terms of higher yields and incomes, but that the majority of them still regret their choice to participate in the contract scheme and would prefer to exit if they could. The analysis emphasises that studies that only focus on a limited set of economic metrics are unable to fully account for farmers' satisfaction with their contracts and their dropout behaviour. The company's failure to offer enough information is the fundamental issue with the contract structure. Farmers lack a thorough understanding of the contract, which fosters a lot of mistrust. Farmers' perceptions of the company's opportunistic behaviour, such as during the output weighing process, are highly connected with their desire to leave. They come to the conclusion that concerns of mistrust and a lack of openness can contribute to the failure of smallholder contract schemes and that future study on contract farming should pay greater attention to these issues.

Alulu et al. (2021) in their study "Comparison of technical efficiency and technology gaps between contracted and non-contracted vegetable farmers in Western Kenya" estimated and compared technical efficiency (TE) and technology gap ratios (TGRs) between contracted and non-contracted farmers of chili pepper and spider plants in rural areas of Kenya using both qualitative and quantitative data from a multistage sample of 300 vegetable farmers. They applied the stochastic frontier and two-limit Tobit models to analyze TE and its determinants, respectively. Further, a meta-frontier method was used to estimate TGRs. Results showed that, for both spider plant and chili, contract participants had higher mean TE with respect to the meta-frontier (0.66 and 0.24) compared to non-participants (0.12 and 0.15), respectively. Based on the positive effect of contract farming on TE, the study

emphasizes the need for targeted interventions that reduce the bottlenecks that hinder effective participation in contracts.

In his article "Bitter sugarification: Sugar frontier and contract farming in Uganda, Globalizations," Martiniello (2021), makes the case that, despite initially seeming to have little to do with eviction or displacement, contract farming schemes actually cause poor smallholders to be expelled and/or marginalised from sugar agro-poles due to social differentiation. Contract farming, according to him, is an example of global neoliberal agricultural restructuring, not the antithesis of land enclosures, and it serves to expand the sugar frontier at a low cost. He referred to the process as sugarification, which comprises maximising value extraction from farmers, its appropriation by agribusiness and finance capital, and a regime of production that devalues labour (wage and family) and nature while significantly impacting current livelihoods and landscapes.

Hoang (2021) in his study “Impact of Contract Farming on Farmers’ Income in the Food Value Chain: A Theoretical Analysis and Empirical Study in Vietnam” theoretically defining the impacting mechanism of contract farming on income, sustainability and welfare by utilising the qualitative technique; and empirically analysing the impact of contract farming on income and farming challenges in Vietnam using econometric models. According to the empirical findings, contract farming can make farming easier and less challenging while having a negligible short-term influence on farmers' income. Farmers' income is influenced by characteristics such as education of head, gender of head, kind of crop and technology. Contract farming in general has favourable effects on welfare, sustainability and income throughout the long and medium terms. However, due to the price being close to or lower than the spot market price, rising production costs, declining productivity and poor contract performance, it does not have significant impact in the short run.

Baqutayan et al. (2021) studied “The Implementation of Contract Farming of Fresh Fruits and Vegetables (FFV) for Smallholders in Malaysia: Government Roles and Initiatives” and found that contract farming in Malaysia has successfully improved food production and raised farmers' income. By providing a special allocation, the government has shown that it is strongly committed to supporting the

initiative. The contract farming program's primary goal has been accomplished and Malaysia's agriculture is hoped to play a significant role in the country's economic future and become one of the world's top exporters of agricultural goods.

Rondhi et al. (2022) examine the variables influencing Indonesian broiler farmers' involvement in CF. Smallholder broiler farmers in Indonesia were the source of the nationally representative data used in this study. The information came from the Indonesian Livestock Farm Household Survey (ILFHS) 2014, which included 1,142 farmers spread over 20 regions. The analysis of thirteen variables that could have an impact on farmers' decision to take part in CF was done using logistic regression. Age, gender, education level, household size, farming experience, farm location, broiler population, cooperative membership, cooperative service, farmer group membership, farmer group service, farmer association, and agricultural extension were those factors. According to the findings, six variables had a statistically significant impact on farmers' decisions to take part in CF. Farmers' decisions are positively impacted by factors such as education, land size, population, farmer groups, and agricultural extension. Cooperative service, however, has a detrimental impact. The impact on CF participation is greatest from farmer organisations and agricultural extension services.

Angreheni et al. (2022) studied “the impacts contract farming on cultivation and postharvest practices on red chili farm in Magelang District, Indonesia’ using descriptive statistics and t-test and found that contract farmers' cultivation and post-harvest procedures are superior to those of non-contract farmers in terms of both quality and quantity. Growers acting as the company's agents manage the cultivation and post-harvest operations carried out by farmers in contract farming. Farmers can create goods of higher quality and with more productivity due to strict supervision over their output. It is advised to use contract farming for various agricultural products, particularly for high-risk products with wide price fluctuations, high quality variation, and susceptibility to climate change.

2.2 Contract Farming with respect to Oil Palm

Oil palm (*Elaeis guineensis jacq*) is a tropical tree that originated in west and southwest Africa and spread to tropical countries. The two distinct oils it produces, palm oil and palm kernel oil, are both widely used in industry. It is the most

productive oil crop. With Indonesia and Malaysia being the primary producers, accounting for over 85% of global production, the area covered by oil palm plantations has grown significantly over the past few decades. The rapid population growth has led to a rise in the demand for biodiesel and edible oil leading to oil palm expansion. Around 10 million hectares were harvested globally in 2000, while 17 million hectares were harvested globally in 2013 (FAOSTAT, 2014). Area of oil palm cultivation in 2018 was 19 million hectares, which was 6 % of the global oil-crop area and it produced 36% of global vegetable oil (Ritchie et al. 2020).

Soyebo et al. (2005) evaluated the "Constraints of Oil Palm production in Ife Central Local Government area of Osun State, Nigeria" using descriptive statistics. The fact that all of the oil palm producers were involved in maintaining wild oil palm plantations of the Dura species and underlying issues prohibiting them from producing oil palm are also investigated. Land issues accounted for 81% of the farmers' problems, followed by funding issues (53.2%), a lack of improved planting materials and government assistance (54.4%), inadequate information and cultivation knowledge (53.2%) and a lack of information (54.4%) and financial problem (34.2 percent).

Additionally, they discovered that among the oil palm farmers, 59.5% processed their own oil palm products by themselves and all of them employed traditional methods that yielded minimal output. They suggested that extension workers step up their efforts to inform farmers about better oil palm production management techniques and that farmers be encouraged to form cooperative societies to address the three interrelated issues of inadequate oil palm cultivation knowledge, a lack of funding, and a lack of land by combining their resources.

Agwu (2006) examined the adoption of more advanced oil palm cultivation and processing technology in Nigeria's Abia State. A total of 50 oil palm producers were selected by random sampling method. Information was gathered using an organised interview schedule. Seven-step adoption model was developed to assess adoption's scope. A cut-off point of 2.0 was established using a Likert-type scale to identify the main obstacles to the implementation of the activities. Improved oil palm technology are found to be lacking. The survey found that extension agents are the source of information on the use of new technology for oil palm. The high cost of

agrochemicals (insecticides and herbicides), the high cost of fertilisers, the unavailability of necessary chemicals (insecticides and herbicides), the high cost of fertilisers, the high cost of processing palm fruits in mechanised mills, and the high cost of labour to perform farming-related tasks are the main barriers to the adoption of improved oil palm production and processing technologies. In addition, there were a few minor restrictions. They propose provision of subsidies for agricultural chemicals as well as financial assistance to the farmers.

Vermeulen et al. (2006) conducted research on the smallholder palm oil producing practice in Johor, Malaysia. They found that oil palm farmers are of older age group (45-76 years), with little opportunity for off-farm employment; greater use of family labour than hired labour; little use of fertilisers due to the capital required; only 7% of them used mechanised in-field collection, though owners of power carts also benefited from renting them out; and lower yield than plantations or counterpart smallholders in FELDA. For the independent farmers, a lack of finance and collateral can be a significant barrier. The independent smallholders may potentially be at risk from FFB theft. The main obstacles smallholders must overcome include ownership status, the need for funds to cover the upfront costs of growing palm oil, access to trustworthy information, and the need to strike a balance between the cultivation of cash crops and food security. Risk brought on by global price fluctuations may also pose risk.

Owolarafe et al. (2007) assessed the Oil Palm fruit plantation and production under the contract-growers scheme in Andhra Pradesh and Tamil Nadu States of India using well-structured questionnaires. It was observed that most of the plantations (69.80%) were in the range of 6-10 years of age while most of the plantations visited were small scale with the size of 1-5 ha dominating the sample (76.8%). Further, about 62.5% of the farmers acquired land for the plantation by inheritance while the rest purchased the land. The effect of the plantation size on the cost of establishment was observed to be significant at 95%. Field observation indicated that the cost of plantation establishment also depends on location which influences easy access to land and labour availability. They found that the frequency of weeding is affected by the trees' age. By spending large amount of money on the tasks—weeding, irrigation, and fertiliser application—farmers successfully

performed maintenance work. A cross-tabulation of the effect of fertiliser application on maintenance cost using the chi-square test revealed that it was significant at the 90% level, while weeding was also found to be significant at the 99.99 % level. However, irrigation had little impact. It was found that the majority of the overall maintenance costs was spent towards fertiliser application. Additionally, it was noted that some farmers over-fertilize their fields, which harms the trees. The majority of farmers—about 99% used physical labour to run their farms. A large portion of farmers received government subsidies in addition to funds from personal savings to start their plantations. Fruit hauling and harvesting were carefully planned to guarantee fast processing of fresh fruit bunches by the mills to produce palm oil of the necessary quality. The proportion of fresh fruit bunches harvested that was affected by plantation size was observed to be significant at 99.99% level. Furthermore, it was shown that the impact of plantation age on the output of fresh fruit bunches was significant at 99.0% level. The scheme was profitable for the farmers, but some of them had to deal with fruit insect infestation, water stress, and financial difficulties.

Farmers only sell the fruit to the mill to which they were affiliated as per the scheme. As a result, the relevant section of the "Oil Palm Act" was followed. The majority of the plantations were only about 30 km away from the mill, which made it simple for the farmers to carry the fruits there as soon as the fresh fruit bunches were picked. Collection centres were made in strategic locations where the plantations are far from the mill. The vast majority of farmers (94%) were satisfied with the contract-growers scheme and were willing to continue with it. The main issue that farmers had was the threat of birds. Other problems are water stress, financial problem and scarcity of labour in very few cases.

Some researchers discovered intercropping, and successful oil palm and timber tree planting has been documented. However, compared to other crops, oil palm production generated a greater profit for roughly 90% of the farmers. The farmers' increased income and profit were in line with assessments of significant contract farming operations as reported by Glover and Ghee (1992) and Glover and Kusterer (1990). They concluded from their study that farmers should receive continuous training on both novel and proper plantation management approaches. At

the same time, they asserted that the extension workers must work harder to oversee and guide the farmers. It was advised that suitable methods for frightening birds be introduced, and that farmers who are under a lot of water stress be helped with irrigation infrastructure. They believed that the viability of the plan would be assured if all of these issues were appropriately resolved.

Feintrenie et al. (2010) investigated the factors that led the farmers in Indonesia's Bungo district to favour oil palm. They observed that even during the 2008–2009 financial crisis, clonal rubber had the highest average return on land, followed by oil palm and rubber agro forest. Oil palm, rubber agro forests, and clonal rubber all had average return on labour that was significantly higher than that of paddy fields. Farmers logically choose the reversion to the scarcest factor when land is still readily available and labour is in short supply. As a result, they will choose crops that have a higher return on labour than those that have a higher return on land.

Akangbe et al. (2011) used the Afijio Local Government Area of Oyo State, Nigeria as a case study to explore the challenges and training requirements of oil palm fruit processors in Nigeria. The samples were chosen using a two-stage sampling procedure, and the descriptive statistical tools of frequency distribution, percentages, mean, and need analyses were utilised to analyse the data. Task and gap analyses are components of need analyses. Nearly all of the respondents (80%) used head portage to transport their palm fruit from the farm to the locations where palm oil was extracted. Bicycle (1.3 percent) and vehicles (18.7%) make up the other methods. Traditional, ineffective, and unclean methods were employed by all palm oil extractors. The analysis of training needs revealed the need for training in oil palm extraction processes such as mixing, clarifying, skimming, stripping, and sterilising. The average score across all of these activities is 6. The outcome, however, shown that no training is required for processes including chopping, boiling fruits, digesting, and storage. Due to the fact that all tasks had below-average ratings, the gap results demonstrated that all task shortcomings may be remedied by teaching the task's performance. Poor and insufficient transportation was cited as the main obstacle. Water-related issues came in second, then a labour scarcity and a lack

of interaction with extension agents. The report made recommendations for cooperative development, financing, training, and infrastructure repair.

Ibitoye et al. (2011) investigated the factors influencing oil palm output in Ondo State of Nigeria as the civil war and crude oil discovery had a negative impact on the country's oil palm industry. The three main biological zones of the state—rain forest, derived savannah, and mangrove swamp—were used as the three sub-groups or strata. Structured questionnaires were used to gather data for the study. To analyse and summarise the data, basic descriptive statistics such frequency counts, means, standard deviations, and percentages were used. The significance of the association between the selected variables was assessed, and the differences between groups of variables were tested, using inferential statistics like chi-square, Pearson correlation, and t-test. Additionally, regression analysis was utilised to assess the importance of connections between a number of variables thought to affect oil palm yield in the study.

Transporting seedlings proved to be the biggest obstacle for 23.3 percent of oil palm farmers when trying to buy seedlings from MANR/ADP/NIFOR facilities. 53.3 percent of the seedlings transplanted were younger than 10 months old. Only two of the variables—degree of education acquired (0.043) and number of times respondents attended training sessions (0.054)—were predicted by regression analysis to have a significant connection with oil palm yield at the 0.05 probability level. They suggested educating farmers about the advantages of only transplanting established seedlings from the nursery that are at least 10 months old.

According to Huddleston & Huddleston (2012), oil palm out-growers in Ghana benefited directly from contract agricultural, including higher farming revenues, the development of practical skills, and improved business acumen. The knowledge gained from growing oil palms was commonly applied to growing other tree crops, benefiting farmers in their entire farming endeavours. The acquired knowledge and experience of living under contract led to economic benefits including farmers' conversion from subsistence to commercial farming and investment in or owning other non-farming businesses in their local villages.

Damoah (2012) investigated how the Benso Oil Palm Plantation's small-holder farmers' programme affected the decrease of rural poverty in Ghana's Mpohor

Wassa East district. Frequencies, percentages, chi-square values, p-values, and other statistical methods were used. According to the study, there is no statistically significant link between a smallholder's job situation and their ownership of smallholdings. According to a regression analysis, farmer yield (R-Square=0.888) accounted for up to 88.8% of fluctuations in farmer income. Additionally, it was shown that there was a high positive link between farmer income and yield (R=0.942). That supported the claims that there is a relationship between farmer income and crop yield. Another regression analysis revealed that, at an alpha of 0.05, the effects of deductions (t=6.425; p-value=0.00) on changes in smallholders' net income were statistically significant. Deductions from smallholders' gross revenue explained around 82.1 percent of the variability in their incomes. The model also showed that deductions were highly and favourably correlated with farmers' incomes, with a correlation co-efficient of 0.906. The contribution that smallholdings made to the incomes of male and female smallholders was also noted, and statistically significant disparities were found, confirming that females relied more on income from smallholdings than their male counterparts. Farmers expressed a high level of confidence in the programme and had favourable impressions of the programme, according to a multiple response cross-tabulation. Because of the use of technology and contemporary farming expertise, there was a statistically significant change (at alpha of 0.05) in the harvest of FFBs between before and after farmers joined the scheme. The study came to the conclusion that farmers' earnings were increasing as a result of their involvement in the programme, which had increased access to food security, health care, and education for smallholder households. However, the programme faced a number of difficulties, including poor technical detail understanding and low oil palm prices.

Onoh et al. (2012) conducted research on the farmers in Nigeria's Imo State's Aboh Mbaise Local Government Area regarding their use of enhanced oil palm producing technology. Because of its widespread use in the development of oil palm, Aboh Mbaise was purposefully chosen. Data analysis techniques employed included simple percentages and regression analysis. They discovered that male farmers predominated in the cultivation of oil palm (60 percent). The average number of households was 6, and the average age of farmers was 45.87. The size of the typical

farm is 4.66 ha, and the vast majority of farmers (73.75%) acquired their land through inheritance. Only 2.5% of those polled have no formal schooling. Poor adoption of improved oil palm production technology was caused by a number of factors, including a lack of funding (75%) bad extension contact (50%) poor access to land (37%) scarce farm inputs (29%) and ignorance about improved farm technology (15 percent).

The regression analysis revealed that age and household size had detrimental effects on the adoption of new technology, but gender, educational attainment, and overall farm size had favourable relationships. They suggested that the government take steps to improve informal education initiatives, encourage extension agents to work more effectively, organise farmers into cooperatives, and encourage banks to lend more money to the agricultural sector.

Ezealaji (2012) used an adaptation of the linear programming model to study the marketing and distribution patterns for palm oil in Imo State, Nigeria. Random sampling was used to gather data from the list of marketers active in the marketing of palm oil, while purposeful sampling was used to choose the Local Government Areas and the villages. For data analysis, descriptive and linear programming models were used. Frequency counts, percentages, means, and modes were among the descriptive statistical tools used to analyse the respondents' socioeconomic characteristics. The actual incomes of the recommended locations are significantly less than the optimal incomes, according to a comparison between the marketers' actual net income and the optimal income derived from the linear programming model for the activities recommended. It was found that the minimised objective of the overall transportation cost of sending the commodity to the suggested routes was significantly lower than the actual total transportation cost. Based on the results, it was recommended that the government provide a favourable environment for the distribution of goods across regions by developing transportation infrastructure like rail to improve mobility at a reduced cost.

Rao (2013) investigated the challenges and future of oil palm cultivation in the Krishna and Godavari districts of Andhra Pradesh State. He collected information and data from both primary and secondary sources, which he then analysed using statistical procedures like ANOVA, Chi-Square, Grouped

Correlation, etc. According to the findings, fertiliser application and the quantity of splits have a substantial impact on oil palm yield. Age of oil palms and income were positively correlated. In order to effectively transfer production technology, he recommended that companies play a significant role in the growth of oil palm in their respective assigned zones. The harvesting of oil palms gets more challenging as the length of the trees becomes longer with age, according to oil palm growers, who believed that harvesting machinery should be made available. Furthermore, tax exemption for oil palm is advocated.

Beggs et al. (2013) examined the social and economic significance of oil palm in the area and found the incentives and mechanisms promoting its continuous spread in their study, "The Social Landscape of African Oil Palm Production in the Osa and Golfito Region, Costa Rica." Structured interviews were utilised to collect data on households and means of subsistence from families who raised palm trees, as well as information on plantation management techniques and the producers' perspectives on the contribution of oil palm to regional economies, communities, and ecosystems. Interviews with 25 farmers from four cantons, cooperative and association leaders, and one farmer who does not choose to plant oil palm were conducted using the snowball sampling approach. In the absence of reliable markets and economically viable alternatives, oil palm production spread due to the strong economic incentives for independent growers. The high cost of palm oil, the easy access to substantial finance for start-up costs, and the work's lower labour requirements all draw farmers in. Farmers choose oil palm plantations despite the difficulties of agriculture plantations. Because it gave a better financial payoff with a steady income, independent producers were willing to take a risk. Economic stability increases as a plantation matures; oil palm cultivation on seven hectares or less incurs many of the same costs as larger farms without being able to generate the same profits; it was estimated that at least eight hectares of oil palm cultivation were needed for availing luxuries like, pick-up truck, etc. Transportation costs were significant (up to 19 percent of gross income), increasing with the distance from the palm processing plant and the condition of the road. However, small, medium, and big farmers in the area found that growing oil palm was profitable. Farmers in the area had changed the lifestyles and agricultural landscapes by growing oil palms.

The households that produced oil as well as those that contributed labour and transportation raised incomes and enhanced regional economic outputs. Little, if anything, could match the profits from oil palm planting, and certainly none of the traditional Old-Golfito smallholder production mainstays could (cattle, maize, rice, other fruits). Growing the amount of land converted to oil palm production was made possible by Palma Tica's cost-sharing assistance under a 12- to 14-year contract.

Farmers' perceptions of the top areas for oil palm cultivation and processing in Aniocha South Local Government Area (LGA), Delta State, Nigeria, were evaluated by Ajieh et al. in 2013. Utilizing structured interview schedules, researchers looked at respondents' adoption rates for technology used in oil palm cultivation and processing as well as their perceptions of the industry's top priority areas. The study's findings were summarised using descriptive statistics including mean scores, percentages, standard deviations, and frequency counts. Small-scale farming was evident from the average oil palm farm size in the region, which was 2.6 hectares. The overall mean adoption score for respondents' use of oil palm production and processing technologies was 2.41, indicating limited acceptance of these technologies. The study identified nine priority areas that are essential for increasing oil palm production and processing, including credit facilities for oil palm farmers, favourable land tenure policy, establishment of agrochemical and fertiliser companies; construction of mechanised processing mills at strategic locations; provision of ready markets for oil palm product; favourable pricing system for oil palm product; and sponsorship of research on high yielding varieties and low-cost process.

The report suggested that the government's future efforts to revive oil palm production and processing should be guided by the key regions indicated. It also recommended that the agricultural extension agency educate oil palm growers on the need of utilising better production methods.

Ojemade et al. (2013) studied a Policy Interventions and Economic Benefits for a Market Driven Oil Palm Industry. According to the authors, one of the main obstacles to sustainable oil palm development at all levels is the lack of appropriate policies and management systems linked to environmental and social performance. It

was noted that concerns with policy ambiguity were undermining the Nigerian oil palm industry's output market. They also emphasised the different kinds of market failures that emergent economies experienced. They believe that as the palm oil industry transitions to the production of certified sustainable palm oil, smallholders must improve production techniques and adhere to standards defined by the Round Table on Sustainable Palm Oil (RSPO). Government action should focus on resource re-allocation that could benefit some while without harming others in order to achieve the criteria. It is necessary to establish transformative collaborations with businesses in order to advance the development, promotion, and sustainability of sustainable investment. Prices in the current liberalised market are influenced by supply, domestic demand, and international demand. The present 35 percent levy on imported palm oil in Nigeria has given the local economy significant protection. The authors made a number of recommendations for government involvement in the oil palm sector to support the sector. Government involvement seeks to force producers to pay or absorb the spilled over cost in some way, which could be accomplished by legislation, the application of taxes, and the provision of subsidies. The authors recommended switching from command and control policies to those that operate through markets.

Anwar et al. (2014) carried out an experiment on the technical culture and productivity of oil palm in East Kalimantan Province. Evaluation results of key technical culture application at the nursery stage was found not complying the technical standards recommended, resulting in an estimated loss of yields between 15 percent in year 1 and 40 percent in year 4 with an error value of 2.44 percent to 7.58 percent. In the case of immature plants, failure to apply technical culture resulted in error values between 0.05 and 1.61 percent, which resulted in losses of FFB yields between 0.96 and 65 percent in years 1 and 7, respectively. An error value between 0.34 percent and 1.80 percent was caused by improper use of technological culture during harvest and transport of the harvest yields, which could result in yield losses between 3 percent and 15 percent. The study discovered that the plantations' average productivity was 12.66 tonnes per hectare per year, or 78.96 percent of the baseline productivity potential of FFB at the Marginally Suitable Land (MPA) Land Suitability Classification (S3). The CPO productivity was 3.87 tonnes

per hectare per year, or 76.63 percent of the baseline of the CPO production potential. In the research areas, FFB and CPO productivity was still below the potential level of productivity of the land with the same land suitability classification, which was thought to be the result of non-compliance with the advised standards of technical culture.

Madhavi et al. (2015) evaluated the marketing issues and future of the oil palm industry with a focus on Andhra Pradesh's Krishna District. The social and economic foundations of oil palm agriculture were investigated in the study. We used both primary and secondary data. A questionnaire survey of 200 oil palm growers was used to gather primary data. By doing an empirical analysis and cross-tabulation of survey data, it was possible to better understand the social background of farmers and their attitudes about the cultivation of oil palm. A big portion of the district was covered by Ruchhi Soya Industries Ltd., Ampa Puram, and a smaller portion by Godrej Agrovet Ltd. The district was divided into two zones. According to the plan, the minimum support price for 1999–2000 was set at Rs. 2750 per tonne. The corporation contributed Rs. 2300 per tonne, with the remaining cost being covered by the governments of India and Andhra Pradesh. Due to the precipitous decline in the price on the global market in 2008, many farmers began removing their palm gardens. The minimum support price in India was raised by the government in March 2009 to Rs. 5000/tonne.

Farmers faced a variety of difficulties, including the scarcity of competent labour and the perishable nature of FFBs. Periodic collection of FFBs, a zonal system for oil palm bunch processing, a low minimum support price, the imposition of VAT on oil palm FFBs, an inability to handle monthly price fluctuations, high FFB transportation costs, rising cultivation costs, late payments from the company, and non-payment of the government's minimum support price are all issues. They made suggestions for the government's continued and strengthened support price as well as the strict enforcement of quality regulations: Harvesting machines should be made available to oil palm cultivators; import duties should be levied during the busiest seasons to protect the interests of local producers; the VAT imposed on the FFB of oil palm should be eliminated; and the government should take steps to control the price fluctuation of FFBs. According to farmers, the minimum support

price should be Rs. 7000–8000 regardless of output; the zonal system and giving monopolies to business owners should be stopped by the establishment of multiple processing facilities; continuous collection of oil palm bunches was necessary due to the perishable nature of the fruit; and problems with nonpayment and delayed payment must be resolved by the government in order to encourage farmers to cultivate oil palm. According to the authors, by supporting oil palm growers, the gap between the supply and demand for edible oil might be closed.

Rhebegen et al. (2015) examined the effects of climate, soil and oil palm management practices on yield in Ghana. The soil organic matter had been depleted in the plantations, probably due to poor crop residue utilisation and soil erosion, and soil pH had been reduced due to the application of ammonia-based Nitrogen (N) fertiliser. Soil P level is relatively high in plantations while it is very small in smallholder soil. K status is quite high in plantation and is extremely low in smallholders' farm. Smaller amount of magnesium in plantation in comparison to smallholder farms indicated that it had been depleted due to unbalanced fertiliser application. Smallholder productivity was constrained by low soil nutrients status, especially P and K. Yield gaps are examined and the yield gap YG1 (Yw- caused by water stress) is the most relevant benchmark in Ghana. YG 2 (Ymey- deficiencies in plantation establishment), YG3 (Ynd – failure to diagnose nutrients), YG4 (Yam – failure to implement fertiliser), YG5 (Ya – incomplete crop recovery). Best Management Practices (BMP) was implemented since 2012 and due to time-lagged yield response of oil palm, the study focussed only on YG5, caused by incomplete crop recovery. Blocks were selected for BMP treatment and control reference plots. In the first year of implementation, the average yield in smallholder BMP fields was 10.9 t ha FFB as opposed to 8.4 t ha in REF fields, a difference of 2.5 t ha. More bunches and heavier average bunch weight were produced as a result of improved crop recovery brought on by the provision of suitable access (weeded circle and paths, trimming) (mainly due to complete collection of loose fruit). The difference between Yw and Ya was greatest in smallholder farms throughout all stages of production. It was proven that there was a significant opportunity to boost yields in smallholder fields by simply enhancing crop recovery through the installation of suitable in-field access and stringent harvest interval control. The smallholder farms'

suboptimal plantation management suggested that there was a sizable room for yield enhancement.

According to World Growth (2009), there is a significant opportunity for Indonesian smallholders to increase production on their current acreages by utilising new genetic stock. Compared to many other land uses, oil palm has significant land use returns. A study on the economic advantages of palm oil for Indonesia was published by World Growth (2011). According to the research, private plantations controlled about 49% of palm oil plantations in 2008, smallholders controlled another 41%, and government farms controlled the final 10%. A total of 9.4 million tonnes of palm oil were produced by private plantations in Indonesia in 2008, followed by 6.7 million tonnes by smallholder plantations and 2.2 million tonnes by government plantations. Over 14.5 billion dollars' worth of goods involving palm oil were exported by Indonesia in the same year. Small-scale farmers who grow food for their own consumption had an average net income in 1997 that was seven times higher than that of small-scale oil palm growers.

The study "Oil Palm Plantations; Threats and Opportunities for Tropical Ecosystem" by UNEP (2011) highlights the economic significance of oil palm, which produces one of the most important vegetable oils produced globally, accounting for about 25% of global consumption and 60% of vegetable oil trade internationally (World Bank, 2010). Under optimum management, high-yielding oil palm varieties created through breeding programmes can generate more than 20 tonnes of FFB per hectare per year, which is equal to 5 tonnes of oil per hectare per year (excluding palm kernel oil) (FAO 2002). The estimated global consumption of palm oil is 24% for industrial uses and 47% for food items (USDA 2010). The socioeconomic advantages of sustainable oil palm plantations may include prospects for long-term employment and the reduction of poverty.

The extensive use of fertilisers and pesticides in modern oil palm monoculture is contaminating the soil and water, harming the environment and resulting in habitat fragmentation and biodiversity loss. Peat land drainage greatly raises greenhouse gas emissions. Additionally, it was shown that the rapid growth of oil palm plantations is typically correlated with issues with rights to land use and tenure, as well as with the exploitation of local communities and violations of human

rights. It is found to be a significant difficulty to address issues like the disparities between small scale and large transnational oil palm operations. When the palm oil production farms were built by deforestation, bio-diesel made from palm oil emits more greenhouse gases (GHG) into the environment than the gasoline it replaces. Organizations like the Roundtable on Sustainable Palm Oil (RSPO), Reducing Emissions from Deforestation and Forest Degradation (REDD +), and the Palm Oil, Timber, Carbon Offset (POTICO) project were established to protect the environment and vulnerable communities. To accomplish sustainable management of oil palm production, safeguard the remaining tropical forests, preserve biodiversity, and foster economic growth in emerging nations, mapping and monitoring must be backed by an adequate regulatory framework.

Lifianthia and Husina (2012) investigated the "Productivity and Income Performance Comparison of Smallholder Oil Palm Plantation at Dry Land and Wet Land of South Sumatra Indonesia" and found no significant productivity or income differences between the two areas, despite varying fertiliser usage and oil palm tree ages. Although it should be supported with the use of excellent farming methods, it appears that wet land palm oil has a greater commercial potential.

Juyjaeng and Suwanmaneepong (2018) compares the “costs and returns on oil palm production of member and non-member farmers under large agricultural plot scheme in Bang Saphan Noi district, Prachuap Khiri Khan Province, Thailand”. The employed simple statistical tools like frequency, percentage, mean, standard deviation, and cost-benefit analysis. They found that oil palm production cost of member and that of non-member farmers under large agricultural plot scheme (LAPS) were differed in the cost of planting materials namely organic fertilizer with statistical significance at the 0.05 level (P-value = 0.047), whereas the other costs were not statistically differed. Regarding production returns, the product prices were significantly differed at the 0 .05 level (P-value = .000).

Jamaliah (2018) looks into how the contract farming (CF) model may be used and optimised in the welfare-improving initiatives for the palm oil farmers in Meliau District, Sanggau Regency. He uses a qualitative methodology based on input from the relevant stakeholders, including farmers, businessmen, the government, and notable members of society, and then interprets the results to analyse the data. He

concludes that increasing migration causes population growth and the labour force's predominance as palm oil farmers. The contract farming model is adopted through mutual understanding, shared goals regarding production, input management, technology, product quantity and quality, price, and marketing, as well as agreements and understandings between parties. The role of provincial and regional government including that of NGOs and Universities are hugely important.

Jelsma et al. (2019) assessed "implementation of Good Agricultural Practices among different types of independent oil palm smallholders in Riau, Indonesia" and also investigated whether the wealthy farmers implement better agricultural practices. They select samples based on high resolution satellite imagery from Google maps. From the record of the company, the yields are highest in August and lowest in February. Yields were benchmarked against a 20 Mt ha−1 year−1 production curve. Implementation of Good Agricultural Practices (GAP) among seven types of independent smallholders in Rokan Hulu regency, Riau province were studied. The underlying hypothesis is that larger farmers have more capital and therefore implement better agricultural practices than small farmers, who are usually more cash constrained. A wide range of methods was applied, including farmer and farm surveys, remote sensing, tissue analysis and photo interpretation by experts. Results show that yields are poor, implementation of GAP are limited and there is much room for improvement among all farmer types. Poor planting materials, square planting patterns, and limited nutrient applications were particularly prevalent. This implies that farmers across different typologies opt for a low-input low-output system for a myriad of reasons and that under prevailing conditions, initiatives such as improving access to finance or availability of good planting material alone are unlikely to significantly improve the productivity and sustainability of the smallholder oil palm sector.

Hasibuan et al. (2020) investigated the various macroeconomic factors such as land area, investment, infrastructure, total production and inflation that affect the productivity of oil palm plantations in North Sumatra province. Multiple regression method with the error correction model was employed using secondary data. They found that while the area of land, investment, infrastructure and total production partially have a significant and positive effect, inflation has a significant and negative

effect on the productivity of oil palm plantations in the north sumatra province in the short and long term balance.

Tavaresa and Mota (2020) in their study “Good for whom? Reactions to oil palm contract farming in the Amazonian state of Pará, Brazil” analyzes the acceptance of and resistance to contract oil palm cultivation in Irituia, Pará, Brazil based on an analysis of documents and secondary data sources. The proponents of oil palm cultivation saw its potential for enhancing the quality of life for residents of the region while the critics contend that oil palm cultivation is not in keeping with the local reality and were apprehensive toward oil palm cultivation. In general, contract farming responses—both acceptance and opposition—were dynamic and varied across the various stages.

Besar et al. (2020) in their study, "Socio-economic development of palm oil smallholders in Malaysia," employed face-to-face interview techniques and secondary sources to gather the raw data and information that were then qualitatively analysed. They identified ten problems that oil palm smallholders encountered, including poor oil palm cultivation techniques, a lack of knowledge of modern technology, a lack of capital, low wages, transportation issues, insignificant government subsidies, labour issues, inconsistent oil palm prices, pest and disease problems, and low wages. They suggested enhancing the socioeconomic progress of palm oil cultivators by consultation, display, field inspections, and other initiatives.

In analysing the factors of production of oil palm farming, the Multiple Regression Analysis was used. The result of the study indicates, factor affecting oil palm productivity was land area, which has significant effect on the productivity of oil palm farming in Desa Air Hitam.

Ruml and Qaim (2020a) studied the impacts of two different contractual arrangements between large international processing companies and smallholder farmers on agricultural labour use, household labour allocation, and hired labour demand in Ghana's palm oil industry. They take into account unobserved variation between farmers with and without contracts by using cross-sectional survey data and a willingness-to-pay strategy. They discover that contracts significantly lower the amount of labour used in agriculture since contracting in Ghana is linked to the development of labour-saving practises and technologies. While resource-providing

contracts result in a stronger reallocation of labour inside the farming enterprise, simple marketing contracts lead to the reallocation of the saved home labour to off-farm employment. Labour savings have a greater impact on household labour than on hired labour.

Ruml and Qaim (2020b) analysed the effects of marketing contracts and resource-providing contracts among small holders in Ghana in comparison to the groups who cultivate oil palm with and without any contracts. Resources-providing contracts boost farmers' input utilisation and yield, according to regression models that account for selection bias. Contracts for the provision of resources also encourage greater degrees of specialisation and an expansion of production scale. For small and medium-sized farms, these consequences are particularly significant. The utilisation of inputs, productivity, and the size of the output, however, are not significantly impacted by the marketing agreements. The findings imply that while resource-providing contracts helped in market access, marketing contracts do not alleviate market access.

Ruml and Parlasca (2021) investigated the relationships between the provision of in-kind credit and farming households' formal credit demand and capacity to receive formal credit with respect to the resource-providing oil palm contract for farmers in the South of Ghana. The study was titled "In-kind credit provision through contract farming and formal credit markets." According to the study, having an outstanding debt from an in-kind credit scheme significantly reduces the possibility that credit would be approved, but this effect can be completely offset by telling the bank about the contract and the debt's origin. This suggests that farmers may not necessarily face additional credit restrictions as a result of debt incurred through resource-providing contract agreements.

Sari et al. (2021), in their paper "Efficiency of Land Use in Smallholder Palm Oil Plantations in Indonesia: A Stochastic Frontier Approach" assessed the oil palm lands of smallholders who suffer from inefficient land use in Indonesia. Input distance function technique and stochastic frontier analysis tools were used, together with cross-section data from Statistics Indonesia (BPS) to measure land efficiency. They discovered that land inefficiency affects small-holder oil palm plantations on average, which is not proportionate to the harm it has caused. They recommended

intensification of land use through selection of potential sites, oil palm tree rejuvenation programmes, supporting infrastructure development, and plantation technology advancement in order to slow the rate of deforestation and maximise the use of the land that is already accessible.

Utama et al. (2021) in their study in Indonesia analysed the factors of production of oil palm farming using Multiple Regression Analysis. They found that factor affecting oil palm productivity was land area, having very significant effect on the productivity of oil palm farming in Desa Air Hitam, Indonesia.

Brandão and Schoneveld (2021) analysed how successfully the SPOPP-supported oil palm contract farming has met its commitment to inclusive development. It analyses two recurring SPOPP topics, namely (1) equitable participation and (2) labour allocation to plantation management, using cross-section data gathered in Northeast Pará. The analysis shows that patterns of inclusion and exclusion are significantly influenced by household access to land and labour resources. Findings also show that hiring of external labourers, which rises when households are labour and land poor, has an impact on how much time is allocated to labour. These findings raise concerns about the usefulness of labor-oriented contract farming eligibility criteria and highlight significant issues with the creation of inclusive businesses and value chains.

We have come across various literatures on contract farming practices and oil palm cultivation across the globe. Various models and types of contract farming are seen in the literature. Some of the findings are highlighted below:

First, adoption of improved technology under contract farming have positive effect and boost yield or income (Ragasa, et al., 2018; Nhan & Yutaka, 2019; Harish, 2019; Tekalign, 2019; Bezabeh et al., 2020; Rondhi, et al., 2020, Beggs et al., 2013).

Second, Contract farming leads to increase in productivity (Dubbert, 2019; Herdiansyah et al. 2020; Agreheni et al., 2022). Land area has significant effect on productivity (Besar et al. 2020; Utama et al., 2022). No significant difference in productivity among dry land and wet land farms (Lifianthia & Husina, 2012)

Third, formal contract farmers are having more technical efficiency that those of informal or non-contract farmers (Kusnadia & Paramitab, 2019; Alulu et al., 2021).

Fourth, Decline in productivity of the contract farmers was also observed (Hoang, 2021); non-compliance of recommended technical standards caused lower productivity among small holders (Anwar et al. 2014); inefficiency of land use by small holder oil palm plantations do more harm than the benefits accrue from it (Sari et al. 2021); productivity constraint by low soil nutrients (Rhebengen et al., 2015); contract farming is ineffective as a development approach to connect small scale farmers to profitable agriculture market (Musa et al., 2018).

Fifth, Most farmers are risk-averse (Adnan et al., 2019); as long as farmers opt for low-input low-output system for various reasons, initiatives such as improving access to finance or good planting materials are not likely to significantly improve the productivity and sustainability of small holder oil palm sector (Jelsma et al., 2019). Imbalance bargaining power between the small farmers and the company is also identified as one problem (Chingosho et al., 2020)

Sixth, Oil palm contract farming was also found to result in increased farmer's income in many instance (Owolarafe, et al. 2007; Damoah 2012; Beggs, et al. 2013) while intensification of land use was suggested to increase land use efficiency (Sari, et al. 2021).

Seventh, in order to examine the performance of contract farming, most researchers were applying various methodologies and simple random sampling technique was commonly used for selecting samples. Stochastic Frontier production function was used to measure the technical efficiency (Kusnadia & Paramitab, 2019; Alulu et al., 2021; Sari et al., 2021). Tobit model was also employed (Alulu et al. 2021). Regression analysis was also applied by various researchers (Ibitoye et al. 2011; Damoah, 2012; Onoh et al. 2012; Dubbert, c. 2019; Nhan & Yutaka, 2019; Bidzakin et al. 2019; Kisnadia & Paramitab, 2019; Anh et al. 2019; Rondhi, M. et al. 2020; rakahni et al. 2020; Hasibuan et al. 2020; Besar et al. 2020; Ruml & Qaim, 2020; Utama et al. 2021).

From the above literatures, it can be seen that contract farming, though without criticism, is an important tool for the development of small farmers. With the rapid growth of population and fast depletion of natural resources, contract farming with implementation of Good Agriculture Practice could be an effective tool to attain the Sustainable Development Goals (SDGs). As seen in the literature, intensification of land use could prevent further deforestation by providing more oil from the same area of land and by more efficient use of labour. From the experience of contract farming in various parts of the globe, the status of contract farming in the state of Mizoram would be analysed and it is expected to identify areas for developing the implementation.

From the literatures on contract farming, comparison of the services given by the contracting firms and its impact on the performance of the farmers was not seen. Comparative study of the services offered by the various firms or companies would be of academic interest area of research. The present study tries to fill this gap.

CHAPTER – 3

OVERVIEW OF CONTRACT FARMING IN INDIA

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3.1 Introduction

Contract farming is the practise of producing agricultural goods in accordance with an agreement between a buyer and farmers that specifies the terms for the production and sale of a particular farm product or products. The farmer often commits to deliver certain amounts of a particular agricultural commodity. These must be provided at the time the buyer specifies and must fulfil their quality criteria. The buyer agrees to buy the product in return and, in certain situations, to help with production for example, supplying farm inputs, preparing the land, and giving technical guidance.

3.2 History of Contract Farming in India

The history of contract farming in India dates back to the introduction of opium and indigo production by Europeans in the Bengal Region under the East India Company Regulation (Ray et al. 2020). The East India Company, which was founded in 1612, was the first British establishment in India. The objectives of the Company was to trade with India in various commodities like silk, indigo, cotton, spices, etc. (Victorian Era, n.d.).

Biswas (2019) quoted Bauer (2019) where the latter claimed that opium business was incredibly exploitative and causing impoverishment of Indian peasants. Bauer claimed that poppy cultivation led to a great loss for the farmers and it would have been much better for them without poppy cultivation. He also found that opium was the most important source of revenue, next to the land tax, for the colonial state during the large part of the nineteenth century. Opium production was the largest industry in the Indian subcontinent which produced large quantity of drugs every year. According to Bauer, the peasants were coerced to cultivate poppy for the production of opium and at the same time, they were in loss as the income from opium could not meet the cost of cultivation which entrapped them to the vicious circle of contractual obligations from which it was difficult to escape. The British continued to monopolise the Indian opium trade till the Indian Independence in 1947.

Indigo had been cultivated in India under the British East India Company. The peasants were given cash advance for cultivation of indigo and they are forced to cultivate indigo on at least 25% of their land holdings. The price of the indigo was very low and they need to take fresh loan for the next cultivation. British import of indigo from India accounts for 30 % of its indigo import in 1788 which rapidly increased to 95% in 1810. Forced cultivation of Indigo in Bengal region was stopped in around 1859 after the "Blue Rebellion" and the planters were shifted to Bihar and the Champaran Movement was the result of the plight of the indigo farmers of Bihar. (NCERT, 2018.).

Agriculture had been the source of livelihood for about 58 % of the population of India and around 70% of the rural population still depends on agriculture as their main source of income. The share of agriculture and allied sector in the Gross Value Added (GVA) has been increased from 17.6% in 2018-19 to 20.2% in 2020-21 and the share in Gross Capital Formation (GCF) has also been increased from Rs. 3,62,706 crore in 2017-18 to Rs. 4,46,044 crore 2019-20 (NSO, May, 2021).

Imperial Tobacco Company of India Limited started growing Virginia tobacco in the 1920's and it was later renamed India Tobacco Company Limited in 1970 and the, renamed ITC Ltd. in 1974. Potatoes and tomatoes were cultivated in Hoshiarpur *taluk* of Rajasthan under contract farming with Pepsico, a US-based company.

Established in 1963, the National Seeds Corporation (NSC) served as the primary agency in charge of the manufacture and distribution of commercial seeds for nearly 13 years. The Rockefeller Foundation and USAID supported NSC in its aim of seed production training and quality control. The States Farms Corporation of India Limited (SFCL), a second national agency, was established in 1969 with the goal of providing breeder, foundation, and certified seeds of high yielding varieties. The SFCL continues to be the largest seed-producing agency in the country with its 12 large mechanised farms spread across 8 different states (Pionetti, 1997; Ray, R.K. et al. 2020). The Green Revolution of 1965 in India was launched with the help of a seed geneticist, Dr. M.S. Swaminathan, the father of green revolution, which increased agricultural output, particularly in Haryana, Punjab, and Uttar Pradesh. The

creation of a high-yielding wheat seed variety and rust-resistant wheat strains were significant achievements in this project.

The principle of contract farming was used in India during the British colonial era, and it is still used today, but new models and types of contractual agreements have evolved following independence, (Ghosh, 2003). The Central Government of India initiated formalisation of contract farming system since the green revolution in the country and through which the government provided subsidised fertilisers, pesticides, high yielding variety seeds and skill training. The state government were also involved in procurement of the contracted farm produce for market assurance. The Model Agricultural Produce Marketing Committee (APMC) Development & Regulation Act was circulated to the states by the central government which has a provision for contract farming (Ray et al. 2020). APMC was implemented in few states and it opens the gate for the involvement of the private companies and cooperatives to establish market and do contract farming (Chand, 2012).

After India's independence from the British, various firms were involved in contract farming and expand their area in different states. The cultivated area under contract farming system with some firms and the crops were given in Table 3.1

The performance of contract farming in various states had been studied by various researchers and some of the findings are highlighted in this section. Contract farming has been used for the production of seeds in India since the 1960s and currently, utilised for the production of poultry, dairy products, potatoes, rice, and spinach, among other things (Rehber, 2007). It is a continually evolving process.

Despite having many advantages, contract farmers in India have been found to have a variety of problems, including delays in payments and the delivery of inputs. These must be managed by the companies in order to preserve long-term synergistic relationships between the company and farmers. The government should also pass relevant bylaws to make contract farming a more transparent and equitable business (Nagaraj et al. 2008).

Contract farming has several negative effects on producers' livelihoods, community organisations and institutions, the environment, and gender in Asian,

Latin American, and African countries. Most studies that focus on less developed nations reveal that contracts are prejudiced, short-lived and unclear (Singh, 2000).

Swain (2012) observed that the main challenges contract farmers encounter are late payments, lack of credit, water shortages, and the inability to achieve quality standards. The contract could be in written or oral and it was not secure for the contract farmers. Whenever productivity declines the concerned contracting firm typically shifts production to other farmers and to other regions.

Table 3.1: State-wise cultivated area under contract farming in India

States	Corporates	Crops	Area (ha)
Punjab	NIJJER Agro Foods Ltd.	Tomato and Chilli	250
	United Breweries Ltd.	Barley	2270
	PepsiCo India Ltd.	Basmati, Groundnut, Potato and Chilli	6000
	Satnam Oversease, Sukhjit Starch	Basmati and Maiz	4000
	Satnam Oversease, Amira Indian Foods Ltd.	Basmati	14700
Madhya Pradesh	Cargil India Ltd.	Wheat, Maize and Soybean	17000
	Hindustan Lever Ltd.	Wheat	15000
	Ion Exchange Enviro Farms Ltd.	Several Fruits, Vegetables, Cereals and Pulses	12098
	ITC	Soybean	1200
Maharashtra	Tinna Oil and Chemicals	Soybean	154.800
	Ion Exchange Enviro Farms Ltd. (IEEFL)	Several Fruits, Vegetables, Cereals and Pulses	19
Karnataka	Himalaya Healthcare Ltd.	Ashwagandha	700
	Mysore S N C Oil Co.	Dhavana	400-500
	AVT Naturals Products Ltd.	Marigold and Caprica Chilli	4000
	Natural Remedies Pvt. Ltd.	Coleus	150
	20 Pvt. Co.	Gherkins	8000
Tamil Nadu	Super Spinning 570 Mills	Cotton	570
	Appachi Co.	Cotton	260
	Bhuvi Care Pvt. Ltd.	Maize and Paddy	1000

Source: Harish & Kadrolkar (2016), Satish (2012)

Mishra et al. (2018) found that the key forces behind the adoption of CF are the perception of weather and pest risk, accessibility to irrigation facilities, extension visits, and availability of institutional funding. At the same time, CF adoption boosts food security and risk-takers typically benefiting from greater food security.

Sharma (2016) finds that small farmers, by and large, are not participating in contract farming due to existence of selective bias in contract farming. She suggested increased participation of small farmers through improved institutional frameworks, group contracts and financial incentives for contracting agencies to encourage working with the small holders.

Singh (2002) found that agribusiness firms work with comparatively large producer and their contracts are prejudiced against the small farmer, perpetuating the issues of social segregation and a high chemical input intensity. However, contracting has increased farm revenues and labour employment. The goals of the contracting parties and those of the local economy appear to be inherently at odds with one another.

Dileep et al. (2002) found that processing firms favoured large farmers while selecting for contract. Management cost and return of the contract farmers are almost double that of non-contract farmers. Large contract farmers obtained higher net returns, followed by small and medium ones. They observed substantial scope to increase the production of tomato through making judicious use of critical inputs particularly fertiliser, irrigation and plant protection chemicals. The contract farming gave yield and price assurance whereas the market price was higher than the contract price. Transportation charges formed considerable portion of the marketing cost. In addition, cut in weight, rejection of the produce, lack of adequate number of processing units were the major problems.

Kumar et al. (2008) found that the production of income and employment was found to be almost twice as high on contract farms as opposed to non-contract farms. Both types of farms have a predominance of female labour, according to the study. The main challenges contract farmers face are late payment for crop products, a shortage of credit for crop production, a lack of water for irrigation, inconsistent power supplies, and trouble reaching quality standards. At the same time, the main barriers to increasing contract farming, according to contracting firms, include

farmers who violate the terms and conditions, poor management on the part of the company, frequent price changes on global markets, and a lack of transport vehicles during peak periods.

Behera and Swain (2021) observed that contract farmers are able to produce higher output on an average when compared to non-contract farmers. Land and seed prices were the main determinants of contract farmers' increased productivity. He suggested better institutional mechanism to make it more inclusive for promotion of contract farming and to extract its benefits.

Narayanan (2014) finds that contract farming schemes in developing countries shows high mortality rates as well as high farmer exit or attrition rates, indicating that farmer experiences might be variable.

From the above literatures, advantages and disadvantages of contract farming in respect of Indian agriculture could be seen, which may be summarised as follows:

a) In most cases, contract farming results in higher productivity and higher income.

b) Contract farmers used more inputs than the non-contract farmers.

c) Input support from the sponsor or from the government is required as the contract crops needs more inputs.

d) Contract farmers are having more security in terms of input and marketing of output.

e) Many contracting firms are bias toward large farmers and small farmers are left behind in many cases.

f) Contracting firms are also observed to be shifting from one farmer to another farmer or to other region when productivity declines.

g) Side-selling were also practiced by some farmers when the market price was higher than the contract price.

h) Contract farming was practised in the country where there exist written and oral agreement side by side.

i) Legal backup is required to avoid exploitation of the farmers as well as contract breach by the farmers.

3.3 Legalities of Contract Farming in India

The above observation shows clearly that the contract farming system in the country needs to be regulated with legal back up. After thorough studies and consultation, the Central Government came up with three (3) bills related to agriculture and were passed in the Parliament.

The bills — The Farmers Produce Trade and Commerce (Promotion and Facilitation) Bill, 2020 (FPTC); The Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Bill, 2020 (FAPAFS); and The Essential Commodities (Amendment) Bill, 2020 (ECA) were passed in the Parliament and became Acts after the assent of the President of India. Due to the farmers' protest against the Acts, the Supreme Court of India ordered the Acts to be put on hold and appointed a panel to submit a report on the Acts (Barik, 2021).

The Act is expected to attract more business firms to participate in contract farming thereby, eliminate monopolistic exploitation of farmers. Some of the drawback of the Contract Farming Act, 2020 as highlighted by Barik (2021) are as follows:

i. The method of price determination is not given in the Act.
ii. Provision of required inputs to maintain quality harvest is not specified in the Act, which may lead the farmers to rely more on the sponsor and infrastructural support from the government is also absent.
iii. No provision of support to production loss due to low soil productivity and poor management are not made.
iv. The Act does not made provision for ensuring full participation of the resource-poor farmers (prevention of the sponsors of bias selection).
v. Concentration on high value crop production may in the long run deteriorate the food security of the country and may have adverse environmental impact, for which provisions may be made.

Contract farming has been in practice in India for more than a century. A number of studies on various practices in different states could be found and some of

the findings are highlighted in this chapter. It has been found that contract farming has significant contribution in the development of agriculture in the country. However, there are various points where improvement is required. Various researchers have made suggestions for improvement and Central Government, on realising the requirement for legal back up, passed Contract Farming Act, 2020 in the Parliament.

CHAPTER – 4

INSTITUTIONAL SETTINGS OF CONTRACT FARMING IN MIZORAM

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INSTITUTIONAL SETTINGS OF CONTRACT FARMING IN MIZORAM

Contract farming had never been practiced in a true sense in the state of Mizoram earlier and no literature is found on the topic of contract farming in Mizoram before the introduction of oil palm in the state. The present chapter deals with how contract farming is being introduced through oil palm development programme and corresponding institutional settings for the implementation of oil palm cultivation and marketing. A brief general information about the state, edible oil requirement of India, palm oil import from other countries, the oil palm development programme initiated by the Central Government, implementation of the oil palm development programme in the state and institutional setting for contract farming in the state of Mizoram are given here.

4.1 General Information about the State

Mizoram is one of the states in the Northeast India. Mizoram attained statehood on 20th February, 1987 to be the 23rd state in the Indian union. It covers an area of 21087 square kilometres. Total population as per 2011 census is 1,097,206, out of which male are 555,339 and female are d 541,867. Literacy rate (census 2011) of 91.33% is higher than the national average and it has a sex ratio of 976.

Agriculture is the main source of occupation and about 60% of the population are engaged in agriculture and allied activities. Rice is the staple food of Mizoram. Agriculture census 2015-16 showed total operated area at 112464.71 hectare and about 32% of agriculture workers are engaged in shifting (jhum) cultivation.

As per the Forest Survey report 2021, Mizoram is having the largest percentage of forest cover in the country with 84.53% of its geographical area, followed by Arunachal Pradesh (79.33%), Meghalaya (76.00%), Manipur (74.34%) and Nagaland (73.90%).

The Gross State Domestic Product (GSDP)/ Gross State Value Added (GSVA) of Mizoram has been continuously growing over the years with impressive rate. The share of agriculture & allied activities was also very much higher than

other activities as shown in Table 4.1. At the same time, the share of Mining & Quarrying has been fluctuating.

Table 4.1: GSVA at Factor Cost by Economic Activity: Mizoram

(At Current Prices) (Rs. in lakh)

Sl. No.	INDUSTRY	2014-2015	2015-2016	2016-2017	2017-2018 (Prov.)	2018-2019 (Proj.)	2019-2020 (Adv.)
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*
1	Agriculture, Forestry & Fishing	420218	465297	515112	562783	615323	773501
2	Mining & Quarrying	8718	8247	4983	6665	8788	9506
3	Manufacturing	8111	10460	11155	11208	12249	13386
4	Electricity, Gas, Water Supply & Other Utility Services	136540	147465	194817	256585	335847	439593
5	Construction	125175	141137	151505	178064	199759	224098
6	Trade & Repair, Hotels & Restaurants, Transport, Storage, Communication & Services related to Broadcasting	169459	197984	239340	277325	325944	383992
7	Financial Services, Real Estate, Ownership of Dwellings & Professional Services	76418	88072	85373	89691	95519	101730
8	Public Administration, Defence & Other Services	389751	422760	466596	501727	567094	630275
9	**TOTAL GSVA at Basic Prices**	**1334390**	**1481422**	**1668880**	**1884047**	**2160523**	**2576081**
10	**Gross State Domestic Product atConstant Market Prices**	**1350940**	**1513886**	**1719191**	**1932864**	**2224057**	**2656378**

Source: Mizoram Economic Survey 2019-20

The Primary Sector (Agriculture and allied) contributed 28.48% to the GSVA, the Industry Sector which comprises of (i) Mining & Quarrying, (ii) Manufacturing, (iii) Construction and (iv) Electricity, Gas, Water Supply and Other Utility Services contributed 25.76% and Service Sector comprising (i) Transport, Storage, Communication & Services Related to Broadcasting, (ii) Trade, Hotels & Restaurants, (iii) Finance Services, (iv) Real Estate, Other Professional Services etc. (v) PublicAdministration and (vi) Other Services continues to have the highest contribution to the GSVA, with its share hovering around 51% during the past 8 years.

Rapid land degradation due to shifting cultivation has to be tackled effectively in order to avoid environmental and ecological loss. Therefore, encouraging permanent cultivation is the need of the hour.

4.2 Edible Oil Requirement in India

The growing population of India further increased the demand for edible oil and the domestic production is far behind the domestic consumption. The continuous rise in edible oil import could be seen from Table 4.2, whereas, the improvement in domestic production is negligible which clearly shows the requirement for increase in the domestic production. India's edible oil import bill increased by 34.18% to Rs 1.57 trillion in the oil year ending in October 2022, while the volume increased by 6.85 percent to 140.3 lakh tonnes, according to the Solvent Extractor Association of India (Business Standard, November 14, 2022).

Table 4.2: India's edible oil demand 2010-11 to 2020-21 (in lakh tonnes)

Oil Year (Nov.- Oct.)	Production of Oilseeds*	Net availability of edible oils from all domestic sources	Imports**	Total Availability of Edible Oils
2010-11	324.79	97.82	72.42	170.24
2011-12	297.98	89.57	99.43	189.00
2012-13	309.43	92.19	106.05	198.24
2013-14	328.79	100.80	109.76	210.56
2014-15	266.75	89.78	127.31	217.09
2015-16	252.50	86.30	148.50	234.80
2016-17	312.76	100.99	153.17	254.16
2017-18	*314.59*	*103.80*	*145.92*	*249.72*
2018-19	*315.22*	*103.52*	*155.70*	*259.22*
2019-20	332.19	106.55	134.16	240.71
2020-21#	365.65	113.09	74.40 (Nov-May 21)	

* Ministry of Agriculture
** Directorate General of Commercial Intelligence & Statistics (Ministry of Commerce)
# Based on 3rd Advance Estimates (declared by Ministry of Agriculture on 25.05.2021).
Source: Department of Food & Public Distribution (February 17, 2023)

4.3 Rising Palm Oil Import

As depicted in fig. 4.1, the palm oil import of the country grows drastically due to its demand for domestic and industrial purposes. India's palm oil import was 2696 thousand metric tonnes in 2001 which grew to 7201 thousand metric tonnes

after ten years in 2011, i.e. by 167% during 10-year period. The import during 2021 was 7800 thousand metric tonnes, which was almost 189.32% of the demand in 2001, twenty years ago. Maximum import was witnessed in 2018 with an amount of 9710 thousand metric tonnes, which slumped to 7398 thousand metric tonnes in 2019 due to the import restrictions imposed on import by the central government.

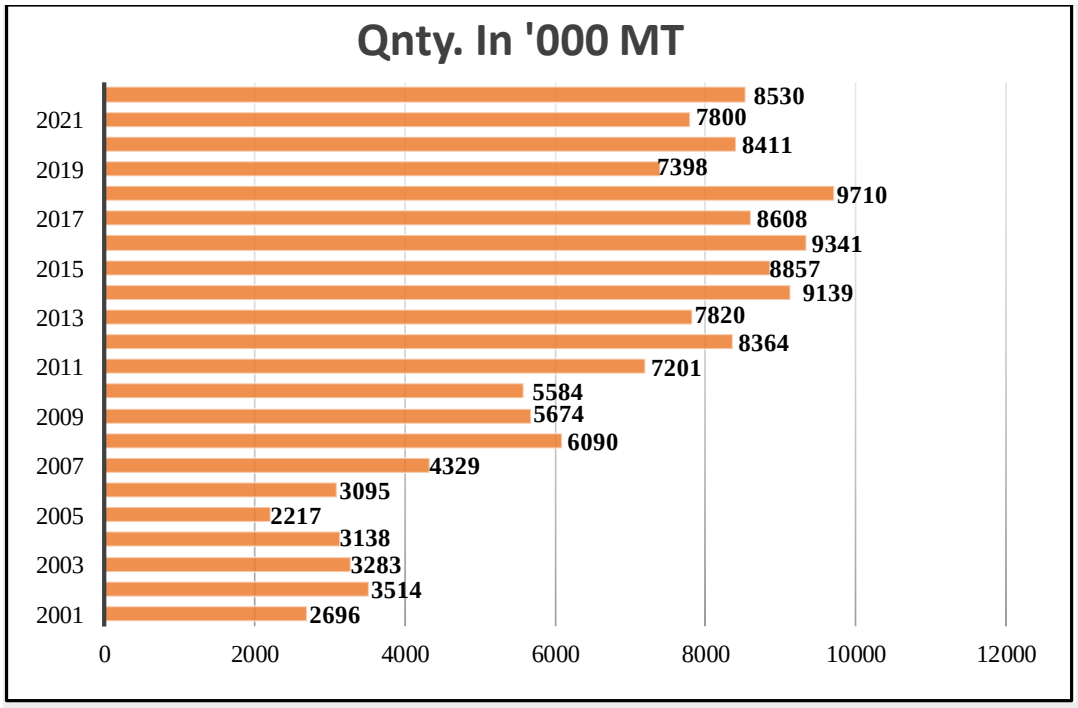

Figure 4.1: Palm oil import of India from 1999 to 2022

Source: USDA, Year of Estimate 2022

4.4 Oil Palm Development Programmes of India

The Indian government decided to encourage oil palm production in order to meet the nation's rising demand for edible oil. 19.3 lakh hectares of potential oil palm land are available over 19 states of the nation, including 2.18 lakh ha in the North Eastern States. (MoAFW, n.d.). Oil palm development and expansion programmes in India are summarised in this section.

The production of Crude Palm Oil in the country is also increasing from 210219 metric tonnes in 2016-17 to 288056 metric tonnes in 2020-21. Andhra Pradesh is the largest producer of Crude Palm Oil an annual average production of 22,14,01,600 metric tonnes and the average share of Andhra Pradesh from the total

CPO produced is 84.91%. Telangana is the second largest producer of CPO with an annual average production of 3,01,64,600 metric tonnes. Kerala came in the thirs position in terms of average annual CPO production of 50,28,600 metric tonnes during the last five years. However, the picture is not encouraging as three states, viz. Tamil Nadu, Goa and Kerala are drastically reducing their production. Mizoram with an average annual CPO production of 6,17,200 metric tonnes came in the sixth position in India and the only state in the North East to produce CPO. Appreciable improvement is found in Telangana followed by Karnataka.

Table 4.3: State-wise and year-wise details of Crude Palm Oil production during last five years from 2016-17 to 2020-21 *(Quantity in Metric Tonnes)*

Sl. No	State	2016-17	2017-18	2018-19	2019-20	2020-21	5-Year Average
1	Andhra Pradesh (AP)	190999	234696	232938	208359	240016	**221401.6**
2	Goa	436	379	411	309	305	**368**
3	Karnataka	2051	2224	2280	2184	2734	**2294.6**
4	Kerala	5989	5191	4857	4825	4281	**5028.6**
5	Mizoram	603	648	625	535	675	**617.2**
6	Tamil Nadu	1194	938	1017	532	698	**875.8**
7	Telangana	8947	27274	37205	38050	39347	**30164.6**
All India		**210219**	**271349**	**279332**	**254794**	**288056**	**260750**
% share of AP		**90.86**	**86.49**	**83.39**	**81.77**	**83.32**	**84.91**

***Source**: This information given by Union Minister of Agriculture and Farmers Welfare Shri Narendra Singh Tomar in a written reply in Rajya Sabha 10.12.2021.*

According to ICAR-IIOPR, oil palm consumes less water than crops like rice, bananas, and sugarcane. For effective water management and judicious water use, the National Mission on Edible Oil-Oil Palm (NMEO-OP) has placed a strong emphasis on promoting micro irrigation and water conservation in oil palm.

Oil palm Development Programme is implemented by Oilseeds Division, Department of Agriculture, Co-operation and Farmers Welfare at the national level

and Joint Secretary (Oilseeds) is the Mission Director of the programme. The Principal Secretary (Agriculture/Horticulture) of the respective state is in charge of the scheme at state level.

The National Oil Palm Development Program is implemented by the Oilseeds Division, Department of Agriculture, Co-operation and Farmers Welfare and its mission director is Joint Secretary (Oilseeds). The state-level administration of the programme is headed by the state's Principal Secretary (Agriculture/Horticulture). Some of the programmes which have been implemented for the development of oil palm are highlighted in this section.

First, the programme on Oilseeds and launched in 1986 as Technology Mission on Oilseeds (TMO), to make the country self-reliant in edible oil production.

Second, Oil Palm Development Programme was launched as a part of the Technology Mission on Oilseeds and Pulses (TMOP) in 1991-92.

Third, Oilseeds Production Programme, Oil Palm Development Programme, National Pulses Development Projects and Accelerated Maize Development Programme of the IXth Five Year Plan were included in the restructured Technology Mission on Oilseeds in 2004-2005 as Integrated Scheme of Oilseeds, Pulses, Oil Palm & Maize (ISOPOM) implemented from 1st April, 2004 during the Xth Five Year Plan.

Fourth, Oil Palm Area Expansion (OPAE) has been implemented from 2011-2012. The budget will be used for providing subsidies to the farmers towards seedling costs, chemical inputs, drip irrigation systems, pump sets, bore-wells and setting up of processing units, implemented under RKVY since 2011-2012.

Fifth, The National Mission on Oilseeds and Oil Palm (NMOOP) was implemented during the XIIth Five Year Plan, from 2014-2015.

Sixth, the National Food Security Mission- Oil Palm was implementd during the period 2018-19 to 2020-21.

Seventh, The National Mission on Edible Oils - Oil Palm (NMEO-OP) was approved with the goal of improving the production of edible oilseeds and the availability of oils in the nation by utilising the growth of the oil palm area, raising CPO output, and lowering the burden of edible oils imports. It will concentrate on raising oil palm production of edible oil. According to NMEO-Oil palm, the

following goal has been set for oil palm area expansion by 2025–2026: To grow the area of oil palm to 10 lakh hectares from 3.5 lakh ha during 2019–20 by 2025–26 (an additional 6.50 lakh ha), of which 3.22 lakh hectares are projected for general state and 3.28 lakh ha in North Eastern states with a targeted FFBs production of 66.00 lakh tonnes. The goal is to expand the production of crude palm oil from 0.27 lakh tonnes in 2019–20 to 11.20 lakh tonnes in 2025–26. Raising consumer awareness will help keep consumption at the current 19 kg per person per year level through 2025–2026.

4.5 Potential Area for Oil Palm Cultivation in Mizoram

Oil Palm has to be grown in areas below 900 meter (MSL) and the District wise Oil Palm potential area as assessed in the year 2020 is given below. Kolasib district is having the largest potential area followed by Mamit district. Siaha district is having the smallest potential area followed by Lawngtlai district. Champhai district has no potential area for cultivation of oil palm.

Table 4.4: Oil Palm Potential Area (Assessment 2020)

Sl. No	District	Geographical Area(ha)	Oil Palm Potential area as assessed in 2020 (ha)	% from Geographical area
1	Aizawl	3,57,631	11,150	3.11
2	Serchhip	1,42,160	9,000	6.33
3	Siaha	1,39,990	2,000	1.43
4	Kolasib	1,38,251	14,141	10.23
5	Mamit	3,02,575	13,500	4.46
6	Lunglei	4,53,800	10,000	2.20
7	Lawngtlai	2,55,710	7,000	2.74
TOTAL		**21,08,700**	**66,791**	**3.17**

Source: Department of Agriculture, Government of Mizoram.

4.6 Oil Palm Cultivation under Contract Farming System in Mizoram

The Mizoram Oil Palm (Regulation of Production and Processing) Act, 2004 (Act No. 10 of 2004) was passed by the Mizoram Legislative Assembly and obtained the Governor's assent on December 2, 2004. (*Oil Palm Act, 2004 in Appendix II*).

The Integrated Scheme of Oil Seeds, Pulses, Oil Palm & Maize (ISOPOM) programme has been in place in Mizoram since 2004-2005 after receiving administrative approval from the Ministry of Agriculture and Cooperation. Government of India. Since then, all the subsequent programmes for oil palm development introduced by the Central Government have been implemented in the state. Among the States of North East India, Mizoram is regarded as the pioneer of Oil Palm cultivation.

Table 4.5: Oil Palm Development Programmes Implemented in Mizoram

Scheme	Period of Implementation	Duration	Achievement	
			Physical (in ha.)	Financial (Rs. in lakh)
ISOPOM	2004–05 to 2010–11	7 years	7,379	3,799.49
OPAE (RKVY)	2011–12 to 2013–14	3 years	10,209	4,792.00
NMOOP (MM-II)	2014–15 to 2017–18	4 years	8,335	3,106.15
NFSM-OIL PALM	2018–19 to 2020-21	3 year	756.70	1982.47
NMEO-OP*	2021-22 to 2025-26	5 years	Being Started	

** For the year 2022-23, only the 1st instalment of the fund was received in the 3rd quarters. Delay in release of fund from the Central Government also hampers the progress.*
Source: Department of Agriculture, Government of Mizoram.

4.6.1 Flow Chart of Contract Farming in Mizoram

Oil palm contract farming has been implemented in Mizoram with the introduction of The Mizoram Oil Palm (Regulation of Production and Processing) Act, 2004. Tripartite agreement between the State Government, the Companies and the farmers were arranged. Memorandum of Understanding (MoU) was signed between the Satte Government and the three companies, viz., Godrej Agrovet Ltd.; 3F Oil Palm Agrotech Pvt. Ltd. and Ruchi Soya Ltd. However, 3F Oil Palm Agrotech Pvt. Ltd. have withdrawn from the contract and Ruchi Soya Ltd. had been taken over by Pantanjali Foods Ltd. since 24th June, 2022. Under the contract farming act, the Government have to provide lumpsum establishment cost of Rs. 25 crore to the company for establishment of Palm Oil Mill and the oil palm seedlings

were purchased from the companies for distribution to the farmers. Famers will be provided with the various required inputs and seedlings. Assistance is given to the farmers till the plants attain the age of maturity, i.e. 4 years. The company have to establish their own nurseries to ensure supply of quality seedling to the farmers. The farmers will supply the fresh fruit bunches to the company. The tripartite relations between the contracting parties was represented in Figure 4.2.

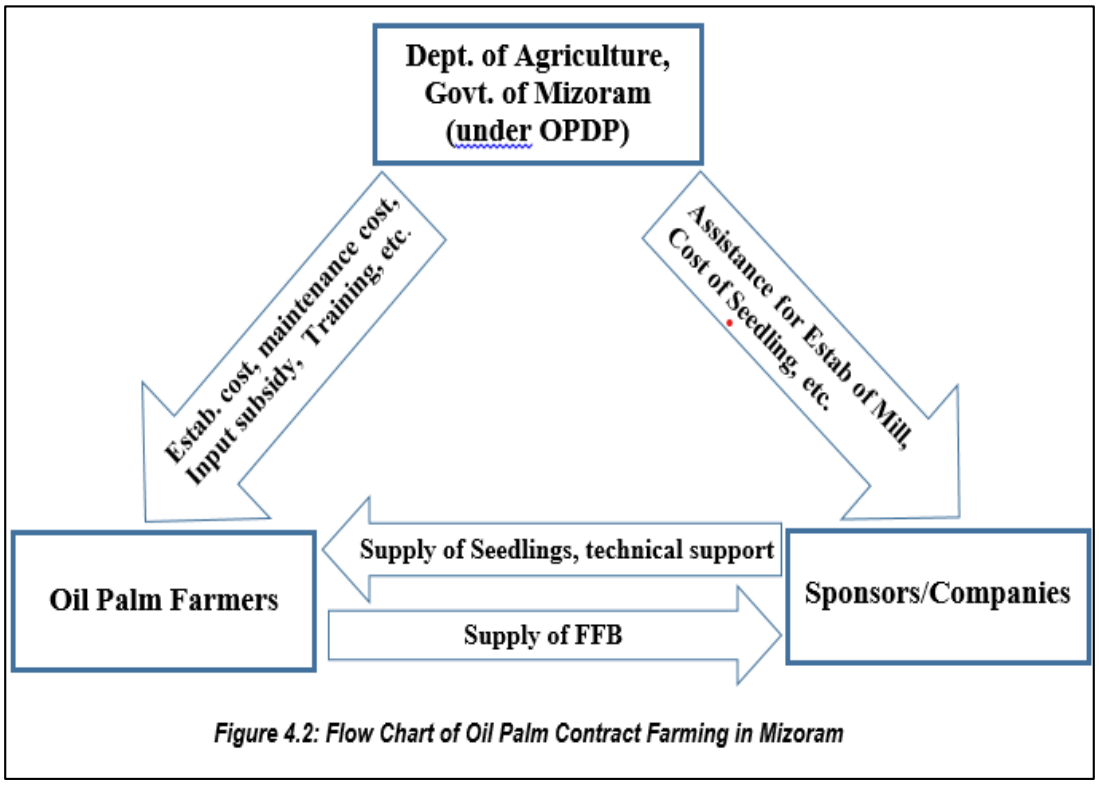

Figure 4.2: Flow Chart of Oil Palm Contract Farming in Mizoram

Source: Own compilation

4.7 Institutional Setting for Contract Farming in Mizoram

With the introduction of the Oil Palm Development Programme (OPDP) by the Central Government, the state government of Mizoram also started implementation of the OPDP and The Mizoram Oil Palm (Regulation of Production and Processing) Act, 2004 (Act No.10 of 2004) had been passed in the Mizoram State Legislative Assembly and obtained the assent of the Governor of Mizoram on the 8th December, 2004. Mizoram started oil palm under contract farming system in a Public Private Partnership (PPP) mode involving the state government, companies (sponsor) and the farmers (oil palm growers).

Secretary, Agriculture Department, Government of Mizoram was appointed as Oil Palm Officer to exercise the power and perform the function for implementation of Oil Palm Act. The concerned District Agriculture Officers were appointed by the Government of Mizoram as Oil Palm Inspector in their respective jurisdiction as required under Oil Palm Act, 2004.

As per the provision in the Oil Palm Act, various committees at at different levels have been constituted for the development of Oil Palm cultivation in Mizoram, which includes:

1. State Level Oil Palm Advisory Committee
2. Project Management Committee
3. Price fixation Committee on Oil Palm FFBs
4. District Level Oil Palm Zonal Committee
5. Village Level Oil Palm Growers Association

4.7.1. The Mizoram Oil Palm Advisory Committee

The Government of Mizoram reconstituted the Mizoram Oil Palm Advisory Committee on 20th March, 2019 for a term of 3 years, under the chairmanship of the Minister, Agriculture Department, Government of Mizoram with a total number of 27 consisting of three MLAs, Secretaries of Agriculture Department, Commerce & Industries Department, Horticulture Department and Fisheries Department; heads of various Line Departments, representative of Govt. of India, Ministry of Agriculture; Representatives of the Contracting Firms; representatives of All Mizoram Famers' Union and representatives of various Oil Palm Growers of the seven oil palm growing districts. Director of Agriculture (Crop Husbandry) is the Member Secretary of the Mizoram Oil Palm Advisory Committee (Appendix III).

4.7.1.1 Functions of Advisory Committee

The Advisory Committee may advise the Government on the following matters:

1. Extension of areas under oil palm cultivation.
2. Problems relating to the cultivation of oil palm.
3. Problems faced by the oil palm processing industries.
4. Coordination between the oil pam growers and industry and sorting out all

matters which may arise.

5. To bring to the notice of the Government any measures that will suit the orderly development of oil palm cultivation and industries.
6. It will make recommendations to the Government on any issue relating to policy matters, administration and implementation of programme for consideration of the State Government.
7. It will hold review meeting at least once in a quarter of the term.

4.7.2 Project Management Committee

Government of Mizoram notified the Project Management Committee (PCM) on Oil Palm on 19th February, 2014 headed by Principal Secretary/ Commissioner/Secretary, Agriculture Department with Director of Agriculture (Crop Husbandry) as Member Secretary. The other members includes Comissioner/Secretary of Finance Department, Industries Department, Public Works Department, Environment & Forest Department; Directors of Agriculture Department, Rural Development Department, Chief Engineer of Minor Irrigation Department; Joint Director and Deputy Direcrtor of Agriculture Department; representatives of the three contracting firms; District Agriculture Officers of the seven oil palm growing districts and Chairmen of all the Oil Palm Zonal Committees of the seven districts (Appendix IV).

4.7.2.1 Powers & Functions of Project Management Committee

The Project Management Committee (PMC) will have full financial and administrative power including those of sanctioning expenditure including assistance, laying guidelines for appointment of staff, accepting tender, etc.

4.7.3 Price Fixation Committee:

Consequent upon the amalgamation of Directorate of Agriculture (CH) and Directorate of Agriculture (R&E), the Government of Mizoram reconstituted Price Fixation Committee of oil palm FFBs (Fresh Fruit Bunch) on the 6th September, 2022, with Secretary, Agriculture Department, Govt. of Mizoram as Chairman and Director of Agriculture Department as Member Secretary. The other members include Joint Secretary, Agriculture Department, Jt. Secretary (Estab.) Finance Department, Joint Director, Agriculture Department, Deputy Director (Planning & Monitoring),

Agri. Department, District Agriculture Officer & Member Secretary of District Oil Palm Zonal Committee of the seven districts, Dy. Director (Oil Palm), Directorate of Agriculture, Chairman, District Oil Palm Zonal Committee of seven district, representatives of Godrej Agrovet Ltd. and Patanjali Foods Ltd. (Appendix V).

4.7.3.1 Powers & Functions of Price Fixation Committee

The Price Fixation Committee headed by Oil Palm Office/Oil Palm Commissioner is authorised to fix the prices of oil palm fresh fruit bunches (FFBs) to be purchased by the factory as directed by the Government.

The price of oil palm fresh fruit bunch was fixed at Rs. 5.50 per kg with effect from 1st June, 2014 which was revised at Rs. 10 per kg with effect from 1st April, 2022. Further, the Price Fixation Committee is preparing to adopt Central Price Formula, which depends on the International Crude palm Oil Price. The price of FFB would no longer be fixed and will vary according to the international market price. This will be a much relief for the oil palm contract farmers.

4.7.4 District Level Oil Palm Zonal Committee

The Government of Mizoram re-constituted the Mizoram Oil Palm Zonal Committee for various districts under the provision of section 5(1) & (2) of the Oil Palm (Regulation of Production & Processing) Act, 2004 on 21st October, 2020 (Appendix VI).

4.7.4.1 Powers & Functions of Zonal Committee

The powers and functions of the Zonal Committee are as follows:

i) to consider the programme of development of Oil Palm Cultivation in the factory zone;

ii) to deliberate on the problems faced by the factory or the growers in cultivation and transport of oil palm;

iii) to devise plans for removal of such problems with the funds as may be available with the Committee and to recommend to the Government such actions asw is necessary for solving the problems;

iv) to recommend to the local bodies, Public Works Department of the

Government for proper improvement and upkeep of roads leading to the factory zone from the cultivating centres including feeder roads;

v) to take steps for prevention and control of oil palm diseases and pests affecting oil palm and render all possible help for the development of oil palm cultivation;

vi) to draw up, plans for training of the cultivators and for extension work in respect of oil palm with the funds as may be available with the Committee;

vii) to consider complaints of the grower regarding transportation, purchase of oil palm fresh fruit bunches and payment of price by the factory to the oil palm cultivators;

viii) to administer the funds as may be available.

4.7.5 Village Level Oil Palm Growers Association

As envisaged in the Oil Palm Act section 10(1), Oil Palm Growers Associations were formed in all the oil palm cultivating villages and the companies are also maintaining registers of oil palm growers in their respective zones. The register has to be updated every year and shall always be available for inspection by the Oil Palm Inspector or any other authority, authorized by the Government or Oil Palm Growers Cooperative Societies in the concerned zone. The Oil Palm Officer is competent to order corrections in the registers based on the report submitted by the inspecting authority.

CHAPTER – 5

ANALYSIS OF OIL PALM PRODUCTION AND SUPPLY CHAINS STATUS

CHAPTER 5

ANALYSIS OF OIL PALM PRODUCTION AND SUPPLY CHAIN STATUS

5.1 Introduction

The nodal department for implementation of Oil Palm Development Programme in Mizoram is Agriculture Department, Government of Mizoram. As per the Report on "*Oil Palm Cultivation in Mizoram*" published by the department in its website, Mizoram is having a total oil palm potential area of 66,791 ha as per the re-assessment made in the year 2020, out of which 26,680 ha (40%) have been cultivated as on July, 2021.

The present study covers four districts, viz., Kolasib district with cultivated area of 6,965 ha; Mamit district with cultivated area of 5,780 ha; Serchhip district with cultivated area of 2,130 ha and Lunglei district with cultivated area of 6,396 ha whereas the total cultivated area of the four study districts is 21,271 ha. The cultivated area of the study districts covers 79.73% of the total cultivated area in the state. As on July, 2021, there were 8,390 farmers (77.38% of oil palm farmers in the whole state) cultivating oil palm from 135 villages (68.53% of oil palm cultivating villages) in the four study districts. The four study districts accounts for 34,962.48 metric tonnes of fresh fruit bunches (FFBs) sold to the partner companies/sponsors, which is 93.80% of the total FFBs sold in the state. Mamit district is the largest producer with a total sale of 18,028.95 metric tonnes which accounts for 48.37% of the total FFBs sold in the state till July, 2021. The district-wise oil palm cultivation and FFB production are given in Table 5.1.

Table 5.1: Status of District-wise oil palm cultivation (As on July, 2021)

Sl. No.	District	No. of farmers	No. of Villages Covered	Area covered (ha.)	FFB sold to partner companies (Metric tonne)
1	Kolasib	2,155	29	6,965	14,459.784
2	Mamit	3,042	42	5,780	18,028.951
3	Aizawl	403	6	859	53.504
4	Serchhip	1,390	15	2,130	547.385
5	Siaha	43	10	86	NA

6	Lunglei	1,803	49	6,396	1,926.358
7	Lawngtlai	2,007	46	4,464	2,239.415
8	Seed Garden, W.Serzawl	NA	NA	NA	17.425
TOTAL		10843	197	26,680	37,272.822

Source: Department of Agriculture, Government of Mizoram (https://agriculturemizoram.nic.in/pages/oilpalm.html)

For the present study, 19 villages from 135 oil palm cultivating villages in the four districts were purposively selected based on the predominant production of oil palm FFBs and 20 farmers from each village were randomly selected to make a total sample of 380 farmers. Field survey was conducted during the months of March to December, 2019. Data were collected from the sample respondents through well-structured interview schedule. However, it was found that only 285 farmers were producing oil palm FFBs and the data were analysed using SPSS software and Microsoft Excel.

Information on oil palm cultivation and the institutional settings for contract farming in the state were collected from the Department of Agriculture, Government of Mizoram. In addition, information were collected from Godrej Agrovet Ltd. and Patanjali Foods Ltd. (known earlier as Ruchi Soya Industries Ltd. having purchased by Patanjali Foods Ltd.). Another company, 3F Oil Palm Agrotech Pvt. Ltd. was involved in contract farming. However, it had withdrawn from the contract agreement and could not be contacted and no data had been collected from the company.

The rate of oil palm fresh fruit bunch (FFB) was fixed by the Price Fixation Committee set up by the state government. The 4th Meeting of the Price Fixation Committee fixed the rate at Rs. 5.50 per kg with effect from 1st June, 2014 and the companies have to collect the FFBs from the collection centres. The Price Fixation Committee further revised the rate of FFBs at Rs.10.00 per kg out of which the company will pay Rs. 5.50 per kg while the Government is paying price support of Rs. 4.50 per kg with effect from 1st April, 2022. Recently, the Government is proposing implementation of the Central Price Formula based on the International

Market Price of Crude Palm Oil and accordingly, the rate of FFB was Rs.10.81 per kg during December, 2022.

Though the companies have to establish Oil Palm Mill in their respective areas under the assistance from the Oil Palm Development Programmes, Mizoram is having only one palm oil mill at Bukvannei village of Kolasib district, established by Godrej Agrovet Ltd. in 2014. The mill produced Crude Palm Oil (CPO) which was further sold to Kolkata through brokers. There is no refinery in the state for CPO and all the CPO produced are sold outside the state.

Oil Palm Seed Garden have been established in 2013 as a joint venture project between the ICAR – Indian Institute of Oil Palm Research, Pedavegi, Andhra Pradesh and the Department of Agriculture, Government of Mizoram at West Serzawl, Mamit District. The Seed Garden covers an area of 60 ha (2 Units). The purpose of the Seed Garden is to cater the need of quality seed sprouts for the N.E States and to earn revenue to the Government of Mizoram from sale of harvested FFBs from the plantation. Parental palms in Oil Palm Seed Garden includes 1,833 no. of Dura (as female parents and 141 no. of Pisifera (as male parents). A total of 1,974 parent plants are available. Oil Palm Seed Sprouts for dissemination is expected to be produced from the year 2025-26 to cater the need of Mizoram as well as other North Eastern States.

According to the *Oil Palm Development Programme In Mizoram (Why Oil Palm in Mizoram)* published by the Department of Agriculture, Government of Mizoram in its web page (*https://agriculturemizoram.nic.in/pages/Oilpalm/Oil%20Palm%20data.pdf*), there was 1,01,000 ha of oil palm potential area in the state with a total number of villages covered under oil palm was 225 and an area of 17,588 ha have been covered under oil palm till 2013-14. However, the potential area was re-assessed in 2020 as 66,791 ha. The reduction of potential area was 34,209 ha and the villages under oil palm cultivation was also reduced from 225 to 197, a reduction by 28 villages.

5.2 Palm Oil Supply Chain in Mizoram

The Government of Mizoram has signed Memorandum of Understanding (MoU) with three companies, viz. Godrej Agrovet Ltd., for Kolasib and Mamit districts, Ruchi Soya Industries Ltd., (to be known as Patanjali Foods Ltd. with effect

from 24th June, 2022) for Lunglei and Lawngtlai districts and 3F Oil Palm Agrotech Pvt. Ltd., for Aizawl, Serchhip and Siaha districts. The companies have established their own nurseries from which they supply oil palm seedlings to the farmers and buy back the produce from the farmers of their allotted districts. Oil palm seedlings were procured by the Government from the companies at Rs. 85.00 per seedling for exotic seedling whereas the indigenous seedling were procured at Rs. 65.00 per seedling and distributed to the farmers as per their requirement.

Due to some technical problems, 3F Oil Palm Agrotech Pvt. Ltd. had withdrawn from the contract and the districts under the company were taken care by the Department of Agriculture, Government of Mizoram. The FFBs produced by Serchhip and Aizawl districts are sold to the Godrej Company through the Department of Agriculture for processing in the Mill. Siaha district has no supply of FFBs at present and was not included in the palm oil supply chain. FFBs produced by farmers of Lunglei and Lawngtlai districts are sold to Patanjali Foods Ltd., which are further sold to Godrej Agrovet for production of Crude palm Oil. A total quantity of 700 metric tonnes of FFBs have been procured from Patanjali Foods Ltd. by Godrej Agrovet Ltd. during the period April to November, 2022. The Crude Palm Oil (CPO) produced by Godrej Agrovet Ltd. is sold to the Brokers who further transport it and sold it to the refineries in Kolkata. The palm oil supply chain in Mizoram is as depicted in Fig. 5.1.

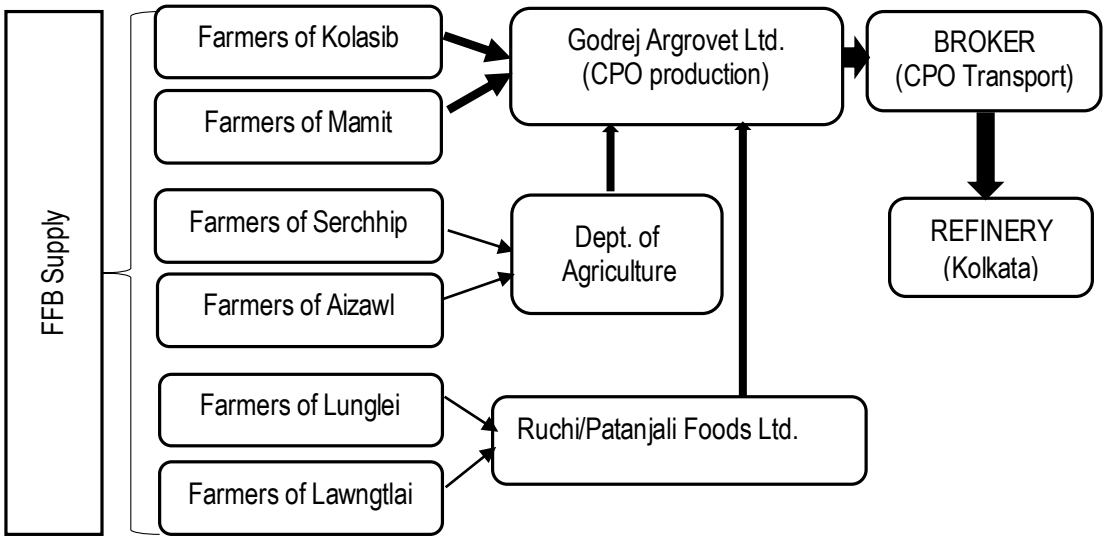

Figure 5.1: Palm Oil Supply Chain in Mizoram

Source: Own compilation

5.3 Performance of the Sponsor/Contracting Firms

As already mentioned, 3F Oil Palm Agrotech Pvt. Ltd. had withdrawn from the contract agreement, therefore, only two companies/sponsors, viz. Godrej Agrovet Ltd. (Kolasib & Mamit districts) and Patanjali Food Ltd. (Lunglei & Lawngtlai districts) are functioning in the state for oil palm development. Questionnaires were sent to the officials of the two companies and reply was received from Godrej in September, 2021 while it was received from Ruchi Soya/Patanjali Foods Ltd. in November, 2021. The responses from the companies were as follows:

(i) No. of villages and farmers

A total number of 44 villages with 1,300 farmers were covered by Godrej Agrovet Ltd. while Ruchi Soya Industries Ltd./Patanjali Food Ltd. covered 95 villages with 3,810 farmers. Godrej Agrovet Ltd. furnished the number of farmers who FFBs to them as 605 in 2018-19; 584 in 2019-20; 540 in 2020-21 and 515 in 2021-22 (till August, 2021). However, Ruchi Soya Industries Ltd./Patanjali Food Ltd. did not respond to the questions. At the same time, year-wise number of farmers selling FFB to the company were dwindling as could be seen from the data.

(ii) FFBs purchased by the sponsors

The FFBs purchased by the sponsors were decreasing as shown in Table 5.2 which may be due to the various problems encountered by the farmers added by Covid-19 pandemic. The quantity of FFB purchased by Godrej Agrovet Ltd. was significantly more than the purchase by Ruchi Soya/Patanjali Foods Ltd. during the period under analysis.

Table 5.2: Fresh Fruit Bunch (FFB) procured by the Sponsors in recent years

Sponsor	Year (*Quantity in Metric Tonnes*)			
	2018-19	2019-20	2020-21	2021-22 (till August 2021)
Godrej Agrovet	4,540	4,300	3,700	2,800
Ruchi/Patanjali Foods	869.79	884.33	850.30	543

Source: Field Survey

(iii) Farmers with mature plants but not selling FFBs

Both the sponsor admitted that there were farmers with mature plants but not selling FFBs due to low price of FFBs and poor infrastructure such as, poor link road or absence of link road.

(iv) Farmers uprooting oil palm plants

Godrej Agrovet Ltd. noticed that some of the farmers have uprooted their oil palm plants due to the poor infrastructure leading to uneconomical harvest while Ruchi/Patanjali Foods Ltd. did not notice uprooting of plants.

(v) Purchase of FFBs by the companies

Godrej Agrovet Ltd. said that they have purchased all the FFBs reaching their collection centres while Ruchi/Patanjali Foods Ltd. claimed that they purchased all the harvested FFBs.

(vi) Collection Centre and installation of weighbridge

Godrej Agrovet Ltd. said that most of the villages have their own collection centres and in some cases, it is shared with the nearby villages. Ruchi/Patanjali Foods Ltd. claimed that collection centres were established in villages having all-weather roads and in some villages, FFBs have been collected during the dry season when the villages were accessible by vehicles. Both the companies/sponsors claimed that it was not feasible to install weighbridge in all the villages due to low volume of FFB production and in some cases, manual weighing was done with weighing scale.

(vii) Provision of receipt on purchase of FFBs by the companies

Both the sponsors said that they provided receipts to the farmers for every purchase of FFBs. Godrej Agrovet Ltd. claimed that there were previously complaints about delayed payment and non-credit of the price of FFBs in the accounts of the farmers, but was resolved now. Ruchi/Patanjali Foods Ltd. claimed that there was no complaint.

(viii) Farm visit by the companies

Godrej Agrovet Ltd. claimed that they have visited 80% of the farmers' plantations while Ruchi/Patanjali Foods Ltd. claimed that they have visited 95% of the farmers' plantation.

(ix) Support provided to the farmers by the companies

Godrej Agrovet Ltd. said that they have provided technical support to the farmers for maintenance of their gardens and in some cases provided fertilisers as a demonstration purpose. Ruchi/Patanjali Foods Ltd. said that they provided technical support to the farmers but not materials.

(x) Improvement in service delivery of the company and success of farmers

Godrej Agrovet Ltd. accepted that the improvement in service delivery of the company/sponsor have positive impact on the success of the farmers while Ruchi/Patanjali Foods Ltd. claimed that the company was doing its level best for its oil palm farmer.

(xi) Seasonality of oil palm seedling supply & age of seedling

Godrej Agrovet Ltd. said that they could not provide oil palm seedlings in the right season due to unavailability of quality seedlings in the country. They also admitted that seedling older than 18 months of age were also distributed to the farmers due to unachievable targets of the Government which spills over to the next year. Ruchi/Patanjali Foods Ltd. claimed that they could provide the seedlings in the right season and did not distribute seedlings older than 18 months of age.

(xii) Practical training

Godrej Agrovet Ltd. said that they could not give practical training to the farmers due to insufficiency of manpower while Ruchi/Patanjali Foods Ltd. claimed that they provided practical training to the farmers.

(xiii) Self-grading of performance

The two companies graded their own performance themselves using Likert 5 point scale of very poor, poor, good, very good and excellent. Both the companies grades themselves ‘very good’.

(xiv) Production & Productivity depends more on farmers

Godrej Agrovet Ltd. agree that palm oil production and productivity depends more on the farmers rather than on the company while Ruchi/Patanjali Foods Ltd. do not agree.

(xv) Performance depends on suitability of farmlands

Godrej Agrovet Ltd. strongly agree that performance depends on the suitability of farm land (topography and soil structure) while Ruchi/Patanjali Foods Ltd. agree with the claim.

(xvi) Performance depends on location/accessibility by vehicle

Both the companies/sponsors strongly agree with the claim that performance depends on the location/accessibility by vehicle.

(xvii) Performance depends on price of FFB

Godrej Agrovet Ltd. strongly agree with the claim that performance depends on price of the FFB while Ruchi/Patanjali Foods Ltd. do agree with the claim.

(xviii) Operational problems

Unavailable support price and topographical conditions are the operational problems faced by Godrej Agrovet Ltd. while Ruchi/Patanjali Foods Ltd. mentioned poor infrastructure like road connectivity, etc.

(xix) Effects of Covid-19 Pandemic

Godrej Agrovet Ltd. claimed that production and procurement of FFBs were affected by Covid-19 whereas Ruchi/Patanjali Foods Ltd. claimed that Covid-19 did not affect the same. Both the companies claimed that Covid-19 encouraged the oil palm farmers, to some extent, as they could sell FFBs while some other crops could not be sold.

(xx) New farmers in 2021-22

Godrej Agrovet Ltd. claimed that they have 40 new farmers in 2021-22 while Ruchi/Patanjali Foods Ltd. has no new farmers.

(xxi) Oil palm cultivation and deforestation

Both the companies/sponsors claimed that oil palm cultivation does not lead to deforestation as it had been done only on already deforested areas of the past jhum lands and barren lands. They also claimed it definitely contributed for the reduction in the practice of jhum (slash & burn or shifting cultivation) cultivation.

(xxii) Management of waste and effluents

With regards to management of waste and effluents, Godrej Agrovet Ltd. said that they have Government's verification and permission certificate while no response was received from Ruchi/Patanjali Foods Ltd.

(xxiii) Supply of FFBs

According to Godrej Agrovet Ltd., farmers had to supply their oil palm fruits from their garden to collection centre mainly located at the National Highway. After this, weighment and loading with transport to factory had been done by the concerned companies. Payment had been done through bank account after 14 days of sale. Patanjali Foods Ltd. claimed that whenever ripened FFB was there, farmers were asked to harvest and after that weighment was taken by the company staff.

(xxiv) Actions to ensure sustainable oil palm cultivation

To ensure sustainable oil palm cultivation, Godrej Agrovet Ltd. said that they were motivating and visited farmers' fields for increase in area and productivity. No response was received from Ruchi/Patanjali Foods Ltd.

(xxv) Institutional constraint faced by the companies

They claimed that they were not facing institutional constraints.

(xxvi) Problems in dealing with the farmers

Low adoption of technology, poor care of gardens by the farmers and poor road connectivity were the problems being faced by Godrej Agrovet Ltd. in dealing with the oil palm farmers while Ruchi/Patanjali Foods Ltd. mentioned poor road connectivity as the problem faced by them.

(xxvii) Actions taken to reach the remote farmers

Godrej Agrovet Ltd. claimed that they have taken up measures to reach the remote villages to meet the factory's demand. Ruchi/Patanjali claimed that collection points were set up to the nearest village and advised farmers to bring their FFB to the collection centre.

(xxviii) Role of Growers' Association

The sponsors agree that the oil palm growers association help in improvement of the performance of the growers in their respective villages. However, they suggest that they have to be linked properly and to be looked after properly by the department.

(xxix) Problems with MoU signed

Both the companies had no problems regarding the MoU. However, Godrej Agrovet Ltd. mentioned that the FFB production could not meet the factory demand till today.

(xxx) Suggestions and Comments

They suggested that government should issue cultivation subsidies in time with 100% coverage of farmers. They were of the opinion that infrastructure facilities, especially, road connectivity should be given priority. They opined that oil palm cultivation is having good prospects in the North East India as the climate and soil fertility are suitable for the development of oil palm. They suggest correct and timely release of Central Assistance to the farmers. Support price need to be implemented with immediate payment till such time when processors' capacity demand were met.

5.4 Source of Information about Contract Farming

Contract farming system is new to the state of Mizoram and it has been formally introduced with the passing of the Mizoram Oil Palm (Regulation of Production & Processing) Act, 2004 on the 2nd December, 2004. There were apprehensions amongst the people, especially those environmentalists, while the government was promoting contract farming system. While contract farming system has been in practice in the state for almost two decades, it is of interest to learn the source of information from where the farmers came to know about the system.

Farmers were asked the source of their information about contract farming and the results were as shown in Table 5.3. The most important source of information was Agriculture Department from which 42.8% came to know about contract farming. The second source of information about contract farming was Company from which 30.5% of the farmers learnt about contract farming. Other important sources includes friends (14.7%), Television (8.4%) and from Newspaper (3.5%). The role of social media in dissemination of information could be enhanced through advertisement and display of success stories, etc.

Table 5.3: Source of Information about Contract Farming

Source of Information about Contract Farming	Frequency	Percent
Agriculture Department	122	42.8
Company	87	30.5
Friends	42	14.7
TV	24	8.4
Newspaper	10	3.5
Total	285	100.0

Source: Field Survey

5.5 Source of Financing Oil Palm Cultivation

Oil palm cultivation have been practiced by the farmers using various sources of fund such as private savings (77.9%), Subsidy (9.1%), NLUP/NEDP (7.7%), MGNREGS (3.9%), Other Sources (1.1%) and Bank Loans (0.4%). It could be seen that the main source of financing oil palm cultivation remains private savings even though the Government is committed to the development of oil palm cultivation in the country. Bank loan was availed by only 0.4% of the farmers and this shows that there was very less chance for the poor farmers to succeed. The government may arrange soft loan facilities to meet the cultivation costs which may be recovered from the sale of FFBs in a fixed quantity which could be handled by the small and marginal farmers. The sources of financing oil palm cultivation were as shown in Figure 5.2.

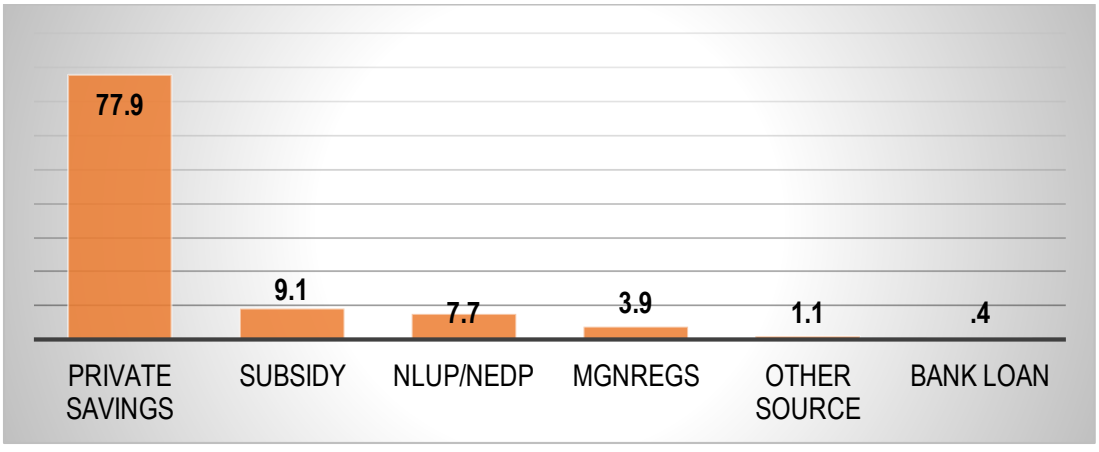

Figure 5.2: Main Sources of Financing Oil Palm Cultivation

Source: Field Survey

5.6 Socio-Economic Conditions of the Oil Palm Farmers

The present study collected data from 380 respondents across four districts of Mizoram. However, only 285 farmers were producing FFBs. As the income and expenditure of the oil palm contract farmers has to be studied, data from 285 farmers were analysed to see the viability of oil palm farming in the state. This section deals with the socio-economic conditions of the oil palm farmers, such as, age, work force, gender, educational qualification, marital status, family economic status, housing status, land ownership status, suitability of land and the impacts of the socio-economic factors on the production of FFBs.

5.6.1 Age of the respondents

The study found that the mean age of 285 farmers was 59 years with a minimum age of 24 years and a maximum age of 99 years. The mean age of the present study was higher than 52.9 years in North-West Selangor, Malaysia found by Alam et al. (2010) and 46 years in Aniocha South local Government Area (LGA) of Delta State, Nigeria found by Ajieh (2013). The result shows that most of the oil palm farmers were relatively old and beyond active economic age. Maximum number of farmers were in the age group of 50-59 years (27.7%) followed by the age group of 60-69 years (27%). Those aged below 50 years comprised only 20.7% of the whole group. In order to develop oil palm cultivation in the state, young generation should be involved by making the programme more attractive. Table 5.4 shows the age structure of the oil palm farmers.

Table 5.4: Age of the Oil Palm Contract Farmers

Age	Frequency	Percent	
<30	2	0.7	
30-39	9	3.2	
40-49	55	19.3	Average Age = 59 years
50-59	79	27.7	
60-69	77	27.0	
70-79	52	18.2	
80 and above	11	3.9	
Total	**285**	**100.0**	

Source: Field Survey, 2018

5.6.2 Available Workforce

Workforce in the present scenario is meant for those people in the family who are physically able to do any kind of job for earning livelihoods and are available for work. Table 5.5 shows the total available work force was 877 comprising 54.70% of the total population with an average number of 3 workers per household. Female work force comprised 44% of the total work force while male comprised 56% of the total work force. The dependent population comprised 45.30% of the whole population.

Table 5.5: Descriptive Statistics on availability of Work Force

	Family Member	Workers	Female workers	Male workers	Dependent
N	285	285	285	285	285
Mean	5.62	3.08	1.35	1.72	2.55
Std. Deviation	2.246	1.400	.887	.918	1.936
Minimum	1	1	0	0	0
Maximum	13	12	6	6	9
Sum	1603	877	386	491	726
Percent	**100**	**54.71**	***44*** *of Workers*	***56*** *of Workers*	**45.29**

Source: Field Survey

5.6.3 Gender of the Respondents

Among the respondents, 91.2% were male and female respondents comprised only 8.8%. The percentage of female respondents was highest in Kolasib district with 15% while it was lowest in Lunglei district with 5.1% only.

Table 5.6: District-wise Gender Distribution of oil palm farmers

District		Gender		Total
		Male	Female	
Kolasib	Count	68	12	80
	% within District	85.0%	15.0%	100.0%
Mamit	Count	101	8	109
	% within District	92.7%	7.3%	100.0%
Lunglei	Count	74	4	78
	% within District	94.9%	5.1%	100.0%
Serchhip	Count	17	1	18
	% within District	94.4%	5.6%	100.0%
Total	**Count**	260	25	285
	% within District	91.2%	8.8%	100.0%

Source: Field Survey

5.6.4 Educational Qualification of the Respondents

Out of the 285 respondents, 3.9% were illiterate and illiteracy rate was highest in Mamit district with 6.4%. There were no illiterate respondents in Serchhip district. A large portion of the respondents comprising 38.9% were having middle education; 28.4% were having primary education; 21.8% were having high school education, 5.3% were having higher secondary education and only 1.8% were having educational degree of graduate and above. Serchhip district had the highest percentage of graduate and above with 11.1% of the respondents while it was lowest in Mamit district with 0.9% only. However, Mamit district had the highest percentage of farmers with higher secondary education at 8.3% and high school at 22.9%. Kolasib district had 36.2% of the respondents with primary school education. The data shows that educational qualification does not correlate with the production of FFBs as the most illiterate district i.e. Mamit was having the largest production of FFBs while the most educated district, i.e. Serchhip district produced the least. More than half (55.6%) of the respondents from Serchhip district were having middle level education as shown in Table 5.7.

Table 5.7: District-wise educational attainment of the respondents

District		Education						Total
		Illiterate	Primary	Middle	High School	Higher Sec.	Graduate & above	
Kolasib	Count	1	29	28	18	3	1	80
	% within Dist	1.2%	36.2%	35.0%	22.5%	3.8%	1.2%	100.0%
Mamit	Count	7	29	38	25	9	1	109
	% within Dist	6.4%	26.6%	34.9%	22.9%	8.3%	0.9%	100.0%
Lunglei	Count	3	20	35	16	3	1	78
	% within Dist	3.8%	25.6%	44.9%	20.5%	3.8%	1.3%	100.0%
Serc-hhip	Count	0	3	10	3	0	2	18
	% within Dist	0.0%	16.7%	55.6%	16.7%	0.0%	11.1%	100.0%
Total	Count	11	81	111	62	15	5	285
	% within Dist	3.9%	28.4%	38.9%	21.8%	5.3%	1.8%	100.0%

Source: Field Survey

5.6.5 Marital Status of the Respondents

Majority of the respondents comprising 81.8% were married, 4.6% were single or unmarried and 4.9% were divorcee while 8.7% were widow or widower. Highest divorce rate (9%) was found amongst the respondents from Lunglei district and highest widow/widower (12.5%) was found in Kolasib district.

Table 5.8: District-Wise Marital Status of oil palm farmers

District		Marital Status				Total
		Married	Single	Divorcee	Widow/ Widower	
Kolasib	Count	65	2	3	10	80
	% within Dist	81.3%	2.5%	3.8%	12.5%	100.0%
Mamit	Count	90	8	4	7	109
	% within Dist	82.6%	7.3%	3.7%	6.4%	100.0%
Lunglei	Count	62	2	7	7	78
	% within Dist	79.5%	2.6%	9.0%	9.0%	100.0%
Serchhip	Count	16	1	0	1	18
	% within Dist	88.9%	5.6%	0.0%	5.6%	100.0%
Total	**Count**	233	13	14	25	285
	% within Dist	81.8%	4.6%	4.9%	8.7%	100.0%

Source: Field Survey

5.6.6 Economic Status of the Respondents' Families

The economic status of the respondents' families were shown in Table 5.9, where it could be seen that 60.7% were Above Poverty Line (APL)[1] while 30.9% were Below Poverty Line (BPL)[2] and 8.4% were Antyodaya Anna Yojana (AAY)[3] families. Serchhip district had the highest percentage of APL families with 77.8% followed by Kolasib district with 70%. Lunglei district was having the highest percentage of BPL families with 34.6% followed by Mamit district with 32.1%. Mamit district was having maximum number of AAY families with 15.6%.

Table 5.9: District-Wise Economic Status of the Families

District		Economic Status of the Families			Total
		AAY	BPL	APL	
Kolasib	Count	1	23	56	80
	% within Dist	1.3%	28.8%	70.0%	100.0%
Mamit	Count	17	35	57	109
	% within Dist	15.6%	32.1%	52.3%	100.0%
Lunglei	Count	5	27	46	78
	% within Dist	6.4%	34.6%	59.0%	100.0%
Serchhip	Count	1	3	14	18
	% within Dist	5.6%	16.7%	77.8%	100.0%
Total	**Count**	24	88	173	285
	% within Dist	8.4%	30.9%	60.7%	100.0%

Source: Field Survey

5.6.7 Housing Status of the Respondents

In the study area, 16.1% of the houses were pucca houses, 82.1% were semi-pucca houses and 1.8% were kutcha houses. Maximum percentage of kutcha houses (5.1%) were found in Lunglei district while there were no kutcha house in Kolasib and Serchhip districts. Mamit district had the highest percentage of Semi-

[1] Above Poverty Line is meant to those families who are having white ration cards issued by the State Govt. for issue of food grains under the Public Distribution System with less subsidy.

[2] Economically disadvantaged households who are given blue coloured ration cards by the State Government for procurement of food grains from the PDS at a subsidised rate.

[3] In order to make Targeted Public Distribution System more focused and targeted towards the poorest of the poor families, "Antyodaya Anna Yojana" (AAY) was launched in December, 2000

Pucca house, where 89.9% were semi-pucca houses. Maximum percentage of pucca houses (28.8%) were found in Kolasib district. Table 5.10 shows the district-wise housing status of the 285 respondents.

Table 5.10: District-Wise Housing Status of oil palm farmers

District		Housing Status			Total
		Kutcha	Semi-Pucca	Pucca	
Kolasib	Count	0	57	23	80
	% within Dist.	0.0%	71.3%	28.8%	100.0%
Mamit	Count	1	98	10	109
	% within Dist.	.9%	89.9%	9.2%	100.0%
Lunglei	Count	4	64	10	78
	% within Dist.	5.1%	82.1%	12.8%	100.0%
Serchhip	Count	0	15	3	18
	% within Dist.	0.0%	83.3%	16.7%	100.0%
Total	**Count**	5	234	46	285
	% within Dist.	1.8%	82.1%	16.1%	100.0%

Source: Field Survey

5.6.8 Ownership of Farm Lands

The status of landholdings is shown in table 5.11 which shows that only 6.7% of the respondents were having Land Settlement Certificate (LSC)[4], 33.7% were having Periodic Patta (P.Patta)[5] whereas majority of the respondents (59.3%) were holding Village Council Pass (VC Pass)[6] issued by the Village Councils. There was only 1 person or 0.4% of the farmers of Mamit district having leased

[4] Land Settlement Certificate (LSC), which is permanent, heritable and transferable, could be issued exactly to the area covered in the Periodic Patta, if the land is reclaimed or developed for the intended purpose.

[5] Periodic Patta could be issued by the Revenue Officer for agriculture and allied purposes, valid only for initial 5 years, which shall automatically lapse unless reclaimed, prepared or developed.

[6] The Lushai Hills District (Village Council) Act 1953 authorised the Village Council to allot a particular region within the boundaries of each village for *jhums/shifting cultivation* each particular year. However, the Village Council used to issue VC Pass for allotment of site for plantations, which has no legal back up, but yet commonly practiced. The Mizoram (Land Revenue) Act, 2013 (Act 5 of 2013), however, does not render the power to allot land for plantation to the Village Councils.

land from others for cultivation of oil palm. Serchhip district was having maximum percentage of VC Pass making up 83.3% of landholdings, followed by Mamit district with 75.2% of landholdings as VC Pass. It is found that 48.8% of the landholdings by the respondents of Kolasib district was in the form of Periodic Patta followed by 46.2% in Lunglei district. 7.7% of the respondents from Lunglei district were having LSC followed by 6.4% of Mamit district, 6.3% in Kolasib district and a 5.6% in Serchhip district.

Table 5.11: District-Wise Landholding Status of oil palm farmers

District		Land Ownership Status				Total
		LSC	Periodic Patta	VC Pass	Leased from others	
Kolasib	Count	5	39	36	0	80
	% within District	6.3%	48.8%	45.0%	0.0%	100.0%
Mamit	Count	7	19	82	1	109
	% within District	6.4%	17.4%	75.2%	.9%	100.0%
Lunglei	Count	6	36	36	0	78
	% within District	7.7%	46.2%	46.2%	0.0%	100.0%
Serchhip	Count	1	2	15	0	18
	% within District	5.6%	11.1%	83.3%	0.0%	100.0%
Total	**Count**	19	96	169	1	285
	% within Dist.	6.7%	33.6%	59.3%	0.4%	100.0%

Source: Field Survey

5.6.9 Suitability of Farm Land

Farmers were asked to grade their lands on its suitability for cultivation of oil palm in terms of slope, fertility and soil structure as per their own perceptions as *Very Much Suitable, Suitable, Moderately Suitable* and *Not Suitable*. Amongst the 285 farmers, 19.3% claimed it moderately suitable; 66.7% perceived it suitable and 14% think that their land were very much suitable for cultivation of oil palm. The study observes that there were not much problem with the suitability of the land for cultivation of oil palm.

Table 5.12: Land suitability as perceived by the owner of oil palm farms

District		Land Suitability			Total
		Very much Suitable	Suitable	Moderately Suitable	
Kolasib	Count	4	56	20	80
	% within Dist	5.0%	70.0%	25.0%	100.0%
Mamit	Count	21	65	23	109
	% within Dist	19.3%	59.6%	21.1%	100.0%
Lunglei	Count	11	60	7	78
	% within Dist	14.1%	76.9%	9.0%	100.0%
Serchhip	Count	4	9	5	18
	% within Dist	22.2%	50.0%	27.8%	100.0%
Total	**Count**	40	190	55	285
	% within Dist	14.0%	66.7%	19.3%	100.0%

Source: Field Survey

5.6.10 Impact of Socio-Economic factors on the Production of FFBs

Table 5.13 depicts the multiple regression analysis results showing a very small impact of the socio-economic factors, viz. age, gender, educational qualification, marital status and economic status of the family, on the quantity of fresh fruit bunch (FFBs) harvest of the farmers. The ANOVA table exhibit [$F(5,279) = 2.043$, $p = .073 > .05$] with an R^2 of .035, which implies that the socio-economic factors are not good predictors of the quantity of FFB harvest.

Amongst the socio-economic factors under analysis, there is no significant predictor of the quantity of FFBs harvest. This may imply that there could be some serious hindrances in the development of the oil palm cultivation.

Table 5.13: Impact of Socio-economic Factors on FFB harvest

Coefficients[a]					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-10.428	83.587		-.125	.901
Age	.192	.877	.013	.219	.827
Gender	-5.914	39.584	-.010	-.149	.881
Education	19.927	10.859	.117	1.835	.068
Marital Status	-9.638	12.346	-.052	-.781	.436
Family Economic Status	24.910	16.739	.093	1.488	.138
[a] Dependent Variable: Total FFB Harvest in Quintals					
R^2 = .035	F = 2.043		p = .073		

Source: Field Survey

5.7 Performance of Contract Farmers

The performance of the oil palm farmers were studied and this section deals with the occupations of the farmers, source of income, land use, conditions of oil palm, irrigation practice, use of agricultural inputs, training attendance, visits by the officials of the government or the companies, use of labour in oil palm cultivation, etc.

5.7.1 Occupations of the Oil Palm Contract Farmers

As shown in Table 5.14, oil palm farmers were taking up multiple occupations besides the oil palm cultivation. Many farmers were having more than two occupations as an income source. The number of farmers involved in 'other plantation' accounts for 36.1% which was the biggest occupation next to 'oil palm cultivation'. The study observed high percentage of the farmers still involved in 'wage labour' (26.3%) and 'shifting cultivation' (20.4%) showing that oil palm cultivation has not been successful enough in mitigating environmental degradation caused by the shifting cultivation (slash and burn) as envisaged in the Oil Palm Development Programme in Mizoram.

Table 5.14: Occupations of the Oil Palm Contract Farmers

Occupation	Frequency	Percent
Oil Palm	285	100
Other plantation	103	36.1
Wage labour	75	26.3
Livestock Farming	58	20.4
Shifting Cultivation	57	20
Seasonal Farming	36	12.6
Petty Trade	29	10.2
Govt. Service	28	9.8
Pension	21	7.4
Fish Farming	16	5.6
Quarrying	12	4.2
Driving	8	2.8
Others	7	2.5
WRC	3	1.1

Source: Field Survey

5.7.2 Main Source of Income of the Oil Palm Contract Farmers

The present study analyses the main source of income of the oil palm contract farmer. The study finds that oil palm farmers were also involved in various other activities for their source of income. Only 37.5% of the farmers used oil palm as their main source of income. It is surprising to see that 20% of the farmers were still engaged in shifting cultivation and 12.6% were still using it as their main source of income whereas the oil palm development programme in the state intends to decrease the practice of shifting cultivation for environmental conservation. More than 10.9% of the respondents were still depending on wage labour as their main source of income.

Table 5.15: Main Source of Income of Oil Palm Contract Farmers

Income Source	Frequency	Percent
Oil Palm Farming	107	37.5
Shifting Cultivation	36	12.6
Wage labour	31	10.9
Govt. Service	24	8.4
Seasonal Farming	19	6.7
Other Plantations	17	6.0
Pensions	16	5.6
Petty Trade	10	3.5
Quarrying	7	2.5
Fish Farming	5	1.8
Livestock Farming	4	1.4
Blacksmithy/Mistiri	2	.7
Handloom	2	.7
WRC	2	.7
Driving	1	.4
Tailoring	1	.4
Contractor	1	.4
Total	285	100

Source: Filed Survey

5.7.3 Land Use Diversification

Oil palm cultivation in the state of Mizoram has been undertaken under contract farming. The contract farming practice in the state took a form of multipartite model involving partnership between government, private companies and farmers. Contract agreement was signed between the government and the companies/sponsors, while there was no written agreement between the farmers and the government or the sponsor. Farmers who were interested in the contract submit their names, bank details, etc., to the department and were recorded. Growers Associations were also formed at the village level who have correspondence with the department and the companies and assist in implementation of the oil palm development programmes in their respective villages.

Oil palm farmers were engaged in various activities for income generation and the present section deals with the land utilisation of the oil palm contract farmers in Mizoram. As depicted in Table 5.16, the average area of land holdings by the farmer amongst the 285 sample farmers was 4.91 ha with the total landholdings of 1399.14 ha. More than half of the land area covering 740.27 ha (52.91%) was utilised for oil palm cultivation and the average area for oil palm cultivation was 2.60 ha per farmer. Only 22.16% of the land area was utilised for cultivation of other crops with the per capita area of 1.1 ha only. This clearly shows that farmers utilised a large portion of their lands and efforts for cultivation of oil palm. Forest area of the farmers' land comprised 24.88% of the total land holdings with per capita forest area of 1.22 ha as shown in Table 5.16.

Table 5.16: Land Utilisation by the Oil Palm Farmers

Land Utilisation	Average	Minimum	Maximum	Total	% to total
Total Landholdings (Ha)	4.91	.50	50	1399.14	100
Oil Palm Area(Ha)	2.60	.50	30	740.27	52.91
Other Cropped Are (Ha)	1.1	.0	23.00	310.10	22.16
Forest Area (Ha)	1.22	.0	30.00	348.17	24.88

Source: Compiled from Field Survey Data

5.7.3.1 Land Utilisation for Oil Palm Cultivation

Average of oil palm cultivation by the 285 contract farmers was 2.60 ha per farmer with a total area of 740.27 ha. There were 10.9% farmers who cultivated in less than 2 ha whereas 9.1% of them cultivated an area larger than 10 ha. Maximum number of farmers comprising 54.7% were cultivating an area between 2 to 4 ha.

Table 5.17: Oil Palm Cultivation Areas

Area (ha)	Frequency	Percent
<2	31	10.9
2-4	156	54.7
4-6	40	14.0
6-8	22	7.7
8-10	10	3.5
>10	26	9.1
Total	**285**	**100.0**
Total cultivated Area (ha)	**740.27**	
Average cultivated area per farmer (ha)	**2.6**	

Source: Field Survey

5.7.4 Year of Planting of Oil Palm

The study covers farmer with different years of experience. The earliest planters planted their oil palm in 1997 whereas some of them planted in 2015. The survey was conducted in the year 2018 and the age of the oil palm trees varies from 3 years to 21 years at the time of survey. The average age of oil palm plantations was 9.73 years. The productivity of oil palm tree at the age of 9 years as per the "Oil Palm Development Programme in Mizoram" issued by the Department of Agriculture, Govt. of Mizoram (n.d.) was 18 metric tonnes of FFBs per ha per year. The average production at age 4 is also 5 metric tonnes per ha per year which have not been achieved with the present production of 4.00 metric tonnes/ha/year. Amongst the farmers, maximum number of farmers planted their oil palm trees in 2007 and the years 2008 and 2009 were also witnessing good number of new farmers. However, the number of new farmers diminished in the following years as shown in Figure 5.3.

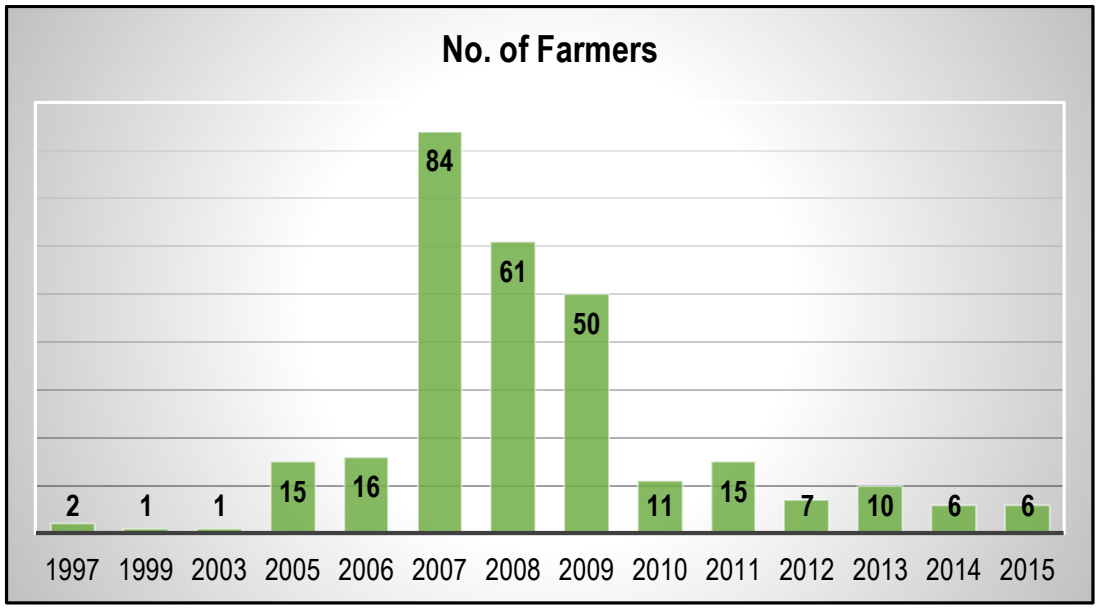

Figure 5.3: Oil Palm cultivators by year of planting

Source: Field Survey

5.7.5 Stage of Oil Palm Plant

The total number of oil palm seedling planted by the 285 sample farmers was 138079 as shown in Figure 5.4 out of which 80136 (58%) are already matured and 24,724 (18%) are still not mature. At the same time, 33,219 (24%) died due to various reasons. The high mortality also need special attention for the development of the oil palm cultivation.

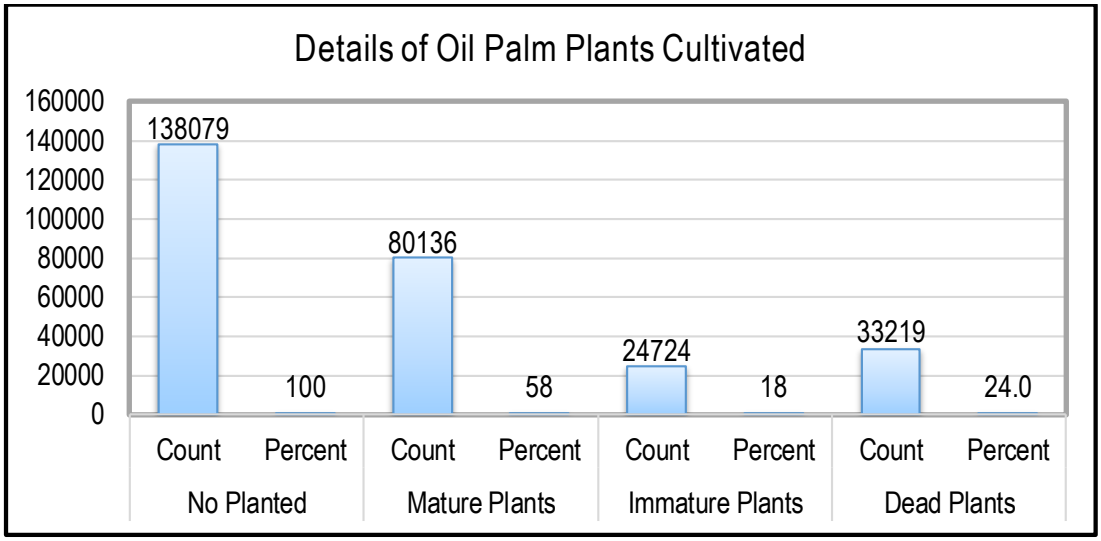

Figure 5.4: Conditions of Oil Palm Plants

Source: Field Survey

5.7.6 Condition & Seasonality of the Oil Palm Seedlings Supplied

Good quality seedling crucial for the success of farming. Therefore, farmers were asked whether the quality seedling they received was good or not. 88.8% responded 'Good' while 10.2% said it was 'Not Good' and the rest 1.1% had 'No Idea'. It may be inferred that the seedlings were mostly of good quality.

Table 5.18: Quality of Oil Palm Seedlings distributed

Response	Frequency	Percent
Good	253	88.8
Not Good	29	10.2
No idea	3	1.1
Total	**285**	**100.0**

Source: Filed Survey

The season of supplying the oil palm seedlings was asked to the farmers and only 35.8% said that they received the seedlings at the right season while 61.8% said that they received the seedlings before the planting season while 1.1% claimed that they received the seedlings in the late season. At the same time, 1.4% said that "they had no idea". Godrej Agrovet Ltd. said that could not provide oil palm seedlings in the right season due to unavailability of quality seedlings in the country. They admitted that seedling older than 18 months of age were also distributed to the farmers due to unachievable targets of the Government which spills over to the next year. Careful survey and record needs to be maintained by the Government Officials in this respect to avoid circumstances which could hamper the development of the programme.

Table 5.19: Seasonality of Oil Palm Seedlings Supply

Response	Frequency	Percent
At the right Season	102	35.8
Before Season	176	61.8
Late Season	3	1.1
No idea	4	1.4
Total	**285**	**100.0**

Source: Filed Survey

5.7.7 Oil Palm Spacing

Oil palm has to be planted at a triangular spacing of 9m x 9m x 9m distance and the farmers were asked whether they follow the instruction. Some of the farmers said that they have planted the oil palm seedlings before attending the training and 35.1% planted at a distance less than the recommended spacing. Majority comprising 60.4% planted at the recommended spacing while 4.6% said that they planted at a spacing more than the recommended.

Table 5.20: Spacing of Oil Palm Plants

Spacing	Frequency	Percent
Less than 9m x 9m x 9m	100	35.1
At 9m x 9m x 9m	172	60.4
More than 9m x 9m x 9m	13	4.6
Total	**285**	**100.0**

Source: Field Survey

5.7.8 Practice of Inter-cropping

More than half (57.2%) practiced inter-cropping whereas the remaining 42.8% did not practice inter-cropping (Tab. 5.21). The important intercrops are mostly perennial crops such as areca nut, pineapple, banana, mango, nibu, hatkora, orange, stink bean, lemon, ginger, climbing wattle, rubber, etc.

Table 5.21: Intercropping Practiced by Oil Palm Farmers

Response	Frequency	Percent
Yes	163	57.2
No	122	42.8
Total	**285**	**100.0**

Source: Field Survey

5.7.9 Irrigation Practice

Farmers were asked whether they practise irrigation for their oil palm plantation and only 7.7% practised irrigation while 92.3% did not practise irrigation as shown in Figure 5.5. Though some farmers verbally said that the plantation does not need irrigation, as most of the harvest are during the rainy

season in the state, it is more likely that sufficient water will increase the fresh fruit bunch production and promotion of irrigation is expected to increase the production of FFBs.

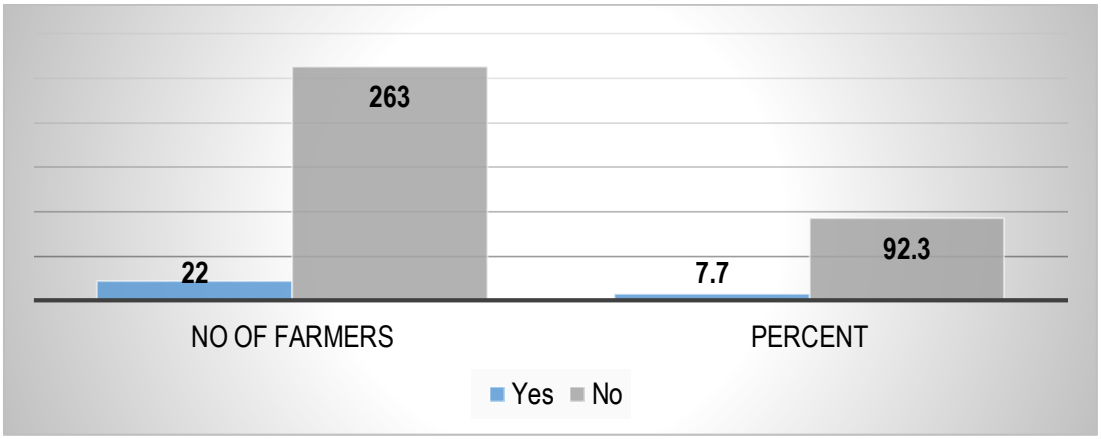

Figure 5.5: Irrigation Practice by the Oil Palm Farmers

Source: Field Survey

5.7.10 Use of Agriculture Inputs and Expenditure

The use of agricultural inputs is one of the factors for success of oil palm production. However, the farmers in the state are not using enough inputs for the increase in production of FFBs. The data relating to application of agriculture inputs are shown in Table 5.22. Herbicide is applied by 57.19% for clearing weeds and only 4.21% applied insecticides. Fertiliser in applied by 54.33% and 46.7% did not apply fertilisers. In some villages, the farmers verbally told that they need fertilisers and there was no supply and there were no shop selling fertiliser.

The per capita (average) application of various inputs were very less to have an effect on the overall production of FFBs. The per capita application of herbicide was 5.37 litres per year per 2.59 ha (average area of oil palm plantation), 0.19 litres of pesticides per year and 1.47 quintals of fertilisers per capita per year.

The percentage share of all items of expenditure could be calculated and majority of the expenditure was incurred on labour comprising 72.82% of the total cost. It may be noted that 31% of the labour cost or 16.80% of the total cost had been utilised for manual transportation of the FFBs to the collection centres, indicating the problems of transportation. The share of insecticide was 0.07%, the share of herbicide was 3.74%, the share of fertiliser was 5.39%, the share of

vehicle hiring for transportation of FFB was 7.71% showing very less investment in agricultural inputs and the share of miscellaneous expenditure including all other expenditures for management of oil palm plantations comprised 10.27% of the total expenditure.

The total annual expenditure for oil palm cultivation incurred by 285 oil palm farmers was Rs. 1,52,12,379 which includes expenditures on labour (Rs.1,10,77,150), herbicides (Rs. 5,68,210), insecticides (Rs. 11,250) fertiliser (Rs. 8,20,100), vehicle hiring (Rs. 11,73,250) and miscellaneous costs (Rs. 41,35,229).

Table 5.22: Input Application and Expenditure of Oil Palm Farmer

Response	Herbicide		Insecticide		Fertiliser	
	No.	**Percent**	**No.**	**Percent**	**No.**	**Percent**
Yes	163	57.19	12	4.21	152	53.3
No	122	42.81	273	96.49	133	46.7
Total	**285**	**100**	**285**	**100**	**285**	**100**
	Qnty.	**Cost (Rs.)**	**Qnty.**	**Cost (Rs.)**	**Qnty (Q)**	**Cost (Rs.)**
Quantity Applied	1531 L	568210	53 L	11250	418	820100
Per Capita Inputs	5.37 L	1994	0.19 L	39.41	1.47	2877.54
Per Ha Inputs	2.07	767.57	0.072	15.20	0.56	1107.84
L= Litre, Q= Quintals		Cost of Vehicle hiring		1173250		
Other Miscellaneous Cost =		Rs. 1562384			Labour Costs =	Rs. 11077150.00
Total Annual Costs = Rs. 1,52,12,379						

Source: Field Survey

Regression analysis was employed to observe the effects of agricultural inputs on the FFBs harvest, From the ANOVA table, regression equation may be written as [F94,280) = 11.880, p = .000 < .01] with an R^2 of .145 implying that about 14.5% of the variation in the dependent variable (FFB harvest) is explained by the independent variables.

The amount of agricultural inputs such as fertilisers and herbicides were having significant impact on the quantity of FFB harvested at .01 level, while irrigation had positive but not significant impact and the impact of insecticide

application was not significant. The result implies that more application of herbicides and fertilizers could lead to increased production of FFBs. However, care should be taken to avoid ecological deterioration for sustainable production.

Table 5.23: Effects of Agricultural Inputs on the FFB Harvest

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	51.915	12.393		4.189	.000
Fertiliser in Quintals	4.501	1.350	.187	3.333	.001**
Herbicide in Litres	7.110	1.303	.308	5.456	.000**
Insecticide in Litres	-1.306	8.850	-.008	-.148	.883
Irrigation	27.990	35.914	-.043	.779	.436

R2 = .145; ** statistically significant at .01 level

a. Dependent Variable: Total FFB Harvest in Quintals

Source: Field Survey

5.7.11 Training Attendance by the Farmers

Training for the farmers had been conducted by the Department of Agriculture, Government of Mizoram for better management of oil palm plantations. However, there were some farmers who have not attended the trainings. Among the 285 farmers, 88.8% attended trainings on oil pal management and 11.2% had not attended trainings. The training periods, according to the farmers were Half Day by 18.9%, One Day by 65.3% and Two Days by 4.6%.

Table 5.24: Training Attendance by the Farmers

Length of Training	Frequency	Percent
Not Attended	32	11.2
Half day	54	18.9
One day	186	65.3
Two days	13	4.6
Total	**285**	**100.0**

Source: Field Survey

An independent samples t-test shows that there was significant difference in average production of oil palm FFBs between those who attended trainings (M = 51.84, SD = 28.322) and those who did not attend trainings (M = 37.09, SD =

26.126) conditions, t (282) = 2.799, p = .005. At the same time, it was found that there was also significant difference in the average productivity of those who had attended the trainings (M = 51.63, SD = 28.538) and those who did not attend the trainings (M = 39.00, SD = 24.553) conditions, t (282) = 2.393, p = .017.

5.7.12 Materials and Other Supports received by the Farmers

Farmers were asked the materials and support received from the Government and the companies. All the farmers received oil palm seedlings. The other support received by farmers were cultivation cost, maintenance cost, cost for half-moon terrace, water pipe and drip irrigation, cost for water tank, harvesting tools, gloves, guide book, etc. The materials and other assistance received by all the farmers were not the same and some of the farmers stated their requirement as in their comments (section 5.12). Shortage of fertiliser supply was mentioned by 10% of the farmers, water problem was mentioned by 6% and requested for irrigation facility and water storage tank, while 3% said that they required harvesting tools. The observation is that field verification and proper monitoring is required to see the reality and for improving the performance of the farmers.

5.7.13 Farm Visits by Officials

Farmers were asked the number of visits by officials of the Government or the Company. Table 5.25 shows that 56.5% of the farms had never been visited by officials. This is against the claim by the Companies that they visited more than 80% of the plantations [section 5.3(*viii*)]. While 16.8% of the farms were visited by officials only once, 1.4% were visited as often as 10 times. The officials of the company and the Agriculture Department may arrange joint verification and monitoring so that no farmers were left behind.

Table 5.25: Farm Visit by Government or Company Officials

No. of Visits	Frequency	Percent
0	161	56.5
1	48	16.8
2	27	9.5
3	27	9.5
4	3	1.1

5	8	2.8
6	4	1.4
7	3	1.1
10	4	1.4
Total	**285**	**100.0**

Source: Field Survey

5.7.14 Farmers' Satisfaction with the Company's Performance

Farmers were asked whether they were satisfied with the performance of their respective companies and only 33% replied positive while 63.5% said that they were not satisfied. At the same time, 3.5% replied "No idea" as shown in Table 5.26. It could be clearly seen that the companies need to improve their performance to boost the interests of the farmers in oil palm cultivation.

Table 5.26: Satisfaction of the Farmers on the Performance of the Companies

Response	Frequency	Percent
Yes	94	33.0
No	181	63.5
No idea	10	3.5
Total	**285**	**100.0**

Source: Field Survey

5.7.15 Use of Labour in Oil Palm Cultivation

Farmers were asked the amount of labours spent (man-days) on their oil palm cultivation and the total annual labour man-days spent were 31,649 man-days, out of which 9,954 (31.45%) were hired labour and 21,695 (68.55%) were family labour. The activities includes weeding, harvesting FFBs and transporting the FFBs. The total annual maintenance cost was estimated at Rs. 1,52,12,379 out of which expenditure on labour including family labour and hired labour was Rs. 1,10,77,150 comprising 72.82% while other expenditure including agricultural inputs and other miscellaneous expenditure was estimated at Rs. 41,35,194 which was 27.18% only. Labour for transporting FFBs comprised 23.1% of the total labour force employed which reveals the genuineness of transportation problems faced by the farmers.

Table 5.27: Annual Labour Usage in Oil Palm Cultivation

Source of Labour	Weeding		Harvesting		Transporting		Grand Total	
	Mandays	Amt Rs.)	Mandays	Amt Rs.)	Mandays	Amt (Rs.)	Mandays	Amt (Rs.)
Family Labour	12995	4548250	4484	1569400	4216	1475600	21695	7593250
Hired Labour	4812	1684200	2057	719950	3085	1079750	9954	3483900
Total	**17807**	**6232450**	**6541**	**2289350**	**7301**	**2555350**	**31649**	**11077150**

Source: Field Survey

5.7.16 Perceived Profitability by the Farmers

Table 5.28 shows that 46% of the sample farmers perceived oil palm cultivation as "profitable" whereas 52.6% said that it was "not profitable" and 1.4% had "no idea" about its profitability. From the data, it can be seen that majority of the oil palm contract farmers perceived oil palm cultivation as not profitable.

Table 5.28: Perceived Profitability of Oil Palm Production

Response	Frequency	Percent
Yes	131	46.0
No	150	52.6
No idea	4	1.4
Total	**285**	**100.0**

Source: Field Survey

5.7.17 Farmers' Intension for More Planting of Oil Palm

Among the 285 farmers, 25.3% intends to plant more while the rest 74.7% were not intending to plant more oil palm as shown in Table 5.29. Farmers cited various reasons for their decision not to plant more oil palm. The top five most common reasons cited by the farmers are Low Rate of FFB (17.9%), Non-availability of vacant land (10.9%), Non-profitability (10.9%), Transportation problems (6%) and Labour-intensive nature of works (4.2%).

Non-profitability could be tackled through upward price revision. Price of FFB has been revised with effect from 1st April, 2022 and this is expected make it a profitable venture. The Agriculture Department said that there was no provision for construction of roads under the scheme. The Ministry may give special

consideration due to the topographical problems being faced in the state. Government schemes like Mahatma Gandhi National Rural Employment Guarantee Scheme, etc. may also be utilised for construction of link roads to the oil palm farms. The labour intensiveness has been added by the problems in transportation and better access to the farm lands will relieve much of the problems and make it less labour-intensive.

The other reasons non-extension of oil palm farms cited by the farmers such as marketing problems, non-collection of FFBs, irregular transfer of FFB cost and no supervision from the company may be addressed by the companies in their concerned districts.

Table 5.29: Reasons for Non-Extension of Oil Palm Farms

Conditions	Frequency	Percent
Interested to Plant More Oil Palm	72	25.3
Low Rate of FFB	51	17.9
No Vacant Land	31	10.9
Not Profitable	31	10.9
Transportation Problems	17	6.0
Labour Intensive	12	4.2
Land not Suitable	11	3.9
Enough plants	10	3.5
Old age of the farmer	9	3.2
Other Works	9	3.2
Marketing Problem	6	2.1
No Collection of FFB	6	2.1
Irregular Transfer of FFB Cost	5	1.8
Long Trunk and Harvesting Problem	4	1.4
Financial Problems	3	1.1
Animal Attack	3	1.1
Will Plant other Crop	2	.7
Time constraint	1	.4
No Longer Production of FFB	1	.4
No Supervision from the Company	1	.4
Total	**285**	**100**

Source: Field Survey

5.7.18 Uprooting of Oil Palm Tree & Reasons

Among the 285 oil palm FFB-producing farmers, 36 farmers (12.6%) have uprooted some of the oil palm trees due to various reasons as cited in Table 5.30. A total of 716 oil palm trees were uprooted by 15 farmers due to less spacing of oil palm trees, 9 farmers uprooted 554 tree as they opt for more profitable crops, 3 farmers uprooted 16 trees due to location problems, 13 trees were uprooted by 3 farmers due to construction of power line, another 3 farmers uprooted 10 trees due to construction of roads, 2 farmers uprooted 155 trees due to tall trunk and 1 farmer uprooted 203 trees due to low price of FFBs. A total number of 1667 tree had been uprooted by 36 farmers with an average number of trees uprooted per farmer amongst the 36 farmers was 40 trees. Minimum uprooted by the farmer was 2 and the maximum uprooted by the farmer was 350 trees. Most of the reasons for uprooting of oil palm trees might have been avoided with good planning and management. However, the current problems being faced by the farmers need to be settled as far as practicable.

Table 5.30: Reasons for Uprooting Oil Palm Trees

Uprooting of Oil Palm Tree		No. of Farmers	Percent	No. uprooted
Uprooting	Yes	36	12.6	1667
	No	249	87.4	-
	Total	285	100.0	-
Reasons for Uprooting	*Not Uprooted*	*249*	*87.4*	-
	Due to less spacing/thinning	15	5.3	716
	Opt for other more profitable crops	9	3.2	554
	Location problem	3	1.1	16
	Construction of power-line	3	1.1	13
	Construction of road	3	1.1	10
	Tall trunk	2	0.7	155
	Low price of FFB	1	0.4	203
	Total	285	100.0	1667
Minimum uprooted by a farmer				2
Maximum uprooted by a farmer				350
Average uprooted by 36 farmers				40

Source: Calculation based on Field Survey Data

5.8 Marketing Fresh Fruit Bunches (FFBs) of Oil Palm

Under the Mizoram Oil Palm (Regulation of Production & Processing) Act, 2014, the Government of Mizoram signed agreements with the three companies, viz. Godrej Agrovet Ltd.., Ruchi Soya Industries Ltd. (presently Patanjali Foods Ltd.) and 3F Oil Palm Agrotech Pvt. Ltd. (withdrawn). Oil palm FFBs were purchased by the companies from the designated Collection Centres on the road-side in various villages. Godrej Agrovet Ltd. have established Palm Oil Mill at Bukvannei, Kolasib district and the FFBs purchased were processed for oil extraction. After the withdrawal of 3F Oil Palm Agrotech Pvt. Ltd., Department of Agriculture, Government of Mizoram shoulders the responsibility and purchased the FFBs from the farmers and which were further sold to the Godrej Agrovet Ltd. for processing. As Patanjali Foods Ltd. have not establish Palm Oil Mill, Godrej Agrovet Ltd. started procuring FFBs from them and the purchase from Patanjali Foods Ltd. amounts to 700 metric tonnes since April, 2022 up to November, 2022.

5.8.1 Company-wise distance of Collection Centres from Plantations

Farmers were asked the distance in kilometres from of the Collection Centre from their plantations and the overall average distance of the Collection Centre from the plantation was 3.23 kilometers. Maximum distance of Collection Centres from the plantations was observed under Patanjali Foods Ltd. at 79 kilometres with an average distance was 5.45 kilometers. From Table 5.31, it could be observed that the farmers had to carry their FFBs covering an average distance of 3.23 kilometers while 53 nos., or 18.6% were at a distance of 3.5 kilometres or more. From the distance to be covered by the farmers, it could be observed that transportation would involve significant portion of expenditures. In order to reduce farmers' expenditure on transportation cost, the Companies should establish more Collection Centres near the plantations of the farmers.

Table 5.31: Distance of Collection Centres from Plantations

Distance (in km.)	Godrej Agrovet Ltd. (189 farmers)	Patanjali Foods Ltd (78 farmers).	3 F Oil Palm Ltd. (18 farmers)	Total (285 farmers)
Minimum	0	0	0.2	0
Maximum	28	79	8	79
Average	2.46	5.45	1.69	3.23

Source: Field Survey

5.8.2 Importance of Farms' Accessibility

In addition to the distance of the farm from the collection centre, the accessibility of the farm by vehicle is very important for transporting the material inputs to the farms and for transporting the FFBs from the plantations to the collection centre. Figure 5.6 shows that 51.6% were accessible by vehicles while 48.4% were not accessible by vehicles. Farms' accessibility is important for not only transporting the inputs to the farms and produces from the farms, but also the labour to work on the farms. It is important to have easy access to farms for better management and for collection of the farms' produces.

The impact of farms' accessibility on the quantity of FFBs harvest was tested using independent samples t-test. The results shows that the FFBs harvested by those farms accessible by vehicles (M = 53.66, SD = 30.30) was significantly higher than those farms which were not accessible by vehicles (M = 46.50, SD = 25.90) conditions; t (282) = 2.136, p = .034, where equal variances are assumed. It can be said that accessibility of the farm land/plantation by vehicle has significant impact on the production of FFBs.

From the above findings, it could be clearly seen that transportation/ accessibility of farms by vehicle is an important factor in the production of FFBs of oil palm. Therefore, accessibility of farm lands should be given priority.

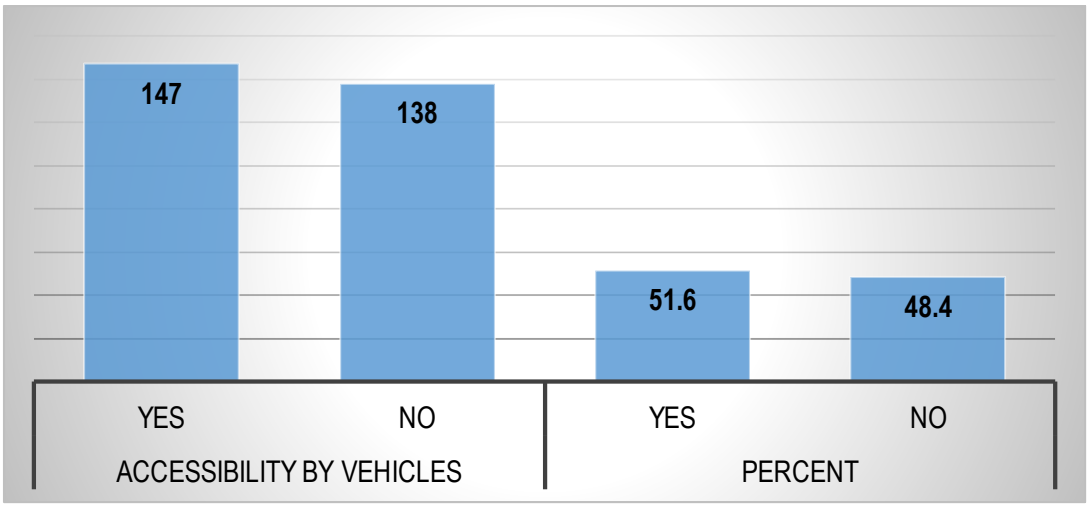

Figure 5.6: Accessibility of Farms by Vehicles

Source: Field Survey

5.8.3 Income from Oil Palm & Other Sources

Table 5.32 shows the annual income range of oil palm farmers from oil palm cultivation. The total annual income of 285 farmers was Rs. 1,98,05,445 with an average annual income of Rs. 69,493 per farmer. It has been found that 7% of the farmers extracted palm oil from their FFBs which they sold it in the local market as against the provision in the Oil Palm Act. However, this could not be avoided in areas where transportation is very difficult and could not reach the collection centre. It could be seen that about 84% had an income of less than Rs. 1,00,000 and 14.9% were having an income ranging from Rs. 1,00,000 to Rs. 4,99,999 while 1.1% were having an income of more than Rs. 5,00,000 Famers' income from all sources other than oil palm were also collected during the survey, having a total income of Rs. 3,31,77,800 with an annual average income from other sources of Rs.1,16,413 per farmer. About 74.2% had an income of less than Rs. 1,00,000 and 25% had an income ranging from Rs. 1,00,000 to Rs. 4,99,999 while only 3.9% were having an income of more than Rs. 5,00,000. The data shows that income from other sources was much more than income from oil palm.

Table 5.32: Income Range of Oil Palm Farmers

Income Range	Income from Oil Palm (Rs.)			Income from all Other Sources (Rs.)		
	Frequency	Percent	C. Percent	Frequency	Percent	C. Percent
Below 50000	160	56.1	56.1	134	47.0	47.0
50000-99999	*80*	*28.1*	*84.2*	69	24.2	71.2
100000-149999	20	7.0	91.2	23	8.1	79.3
150000-199999	8	2.8	94.0	16	5.6	84.9
200000-250000	4	1.4	95.4	10	3.5	88.4
250000-299999	4	1.4	96.8	12	4.2	92.6
300000-349999	3	1.1	97.9	4	1.4	94.0
350000-399999	1	.4	98.2	4	1.4	95.4
400000-449999	1	.4	98.6	1	.4	95.8
450000-499999	1	.4	98.9	1	.4	96.1
500000 and above	3	1.1	100.0	11	3.9	100.0
Total	**285**	**100.0**		**285**	**100.0**	

Income from Oil Palm (Rs.)		Income from all other sources (Rs.)	
Average	69493	Average	116413
Minimum	330	Minimum	10000
Maximum	1223300	Maximum	3600000
Total	**19805445**	**Total**	**33177800**

Source: Field Survey

5.8.4 Production of FFB under Different Companies

The production and productivity of FFBs by the farmers under the three companies in Mizoram, viz., Godrej Agrovet Ltd., Patanjali Foods Ltd. and 3F Oil Palm Agrotech Ltd. were compared using One-Way ANOVA and Games-Howell Post-Hoc Test was employed for comparing each company's performance.

ANOVA table shows that there was significant difference in the amount of FFBs produced by farmers under the three companies at the p = .01 level for the three conditions [F(2,281) = 28.411, p = .0001]. Post hoc comparison using Games-Howell test indicated that the mean score for the farmers under Godrej Agrovet Ltd. (M = 58.48, SD = 26.468) was significantly higher than Patanjali Foods Ltd. (M = 34.54, SD = 23.114) and 3F Oil Palm Agrotech Pvt. Ltd. (M = 31.26, SD =32.60). However, there had been no significant difference between the

mean level of FFB production by the farmers under Patanjali Foods Ltd. and 3F Oil Palm Agrotech Ltd. (presently taken over by the Department of Agriculture, Govt. of Mizoram due to withdrawal of the company). Farmers under Godrej Agrovet Ltd. had produced significantly more than the farmers under Patanjali and 3 F Oil Palm Agrotech Ltd.

Table 5.33: Games Howell test on Production of FFB under the Select 3 Companies

Dependent Variable: Total FFB Harvest in Quintals						
(I) Company	(J) Company	Mean Difference (I-J)	Std. Error	Sig.	99% Confidence Interval	
					Lower Bound	Upper Bound
Godrej Agroovet Ltd.	Patanjali Foods Ltd (Ruchi Soya)	23.936*	3.252	.000	16.24	31.63
	3F Oil Palm Agrotech Pvt. Ltd.	27.217*	7.923	.007	07.11	47.33
Patanjali Foods Ltd (Ruchi Soya)	Godrej Agroovet Ltd.	-23.936*	3.252	.000	-31.63	-16.24
	3F Oil Palm Agrotech Pvt. Ltd.	3.280	8.118	.914	-17.17	23.73
3F Oil Palm Agrotech Pvt. Ltd.	Godrej Agroovet Ltd.	-27.217*	7.923	.007	-47.33	-7.11
	Patanjali Foods Ltd (Ruchi Soya)	-3.280	8.118	.914	-23.73	17.17
*. The mean difference is significant at the 0.01 level.						

Source: Field Survey

5.8.5 Productivity of Farms under Different Companies

A one-way ANOVA shows that there was significant difference in the productivity of the farmers under the three companies at the p = .01 level for the three conditions [F(2,281) = 20.521, p = .000001]. Post hoc comparison using Games-Howell test indicated that the mean productivity of the farmers under Godrej Agrovet Ltd. (M = 57.19, SD = 26.483) was significantly higher than Patanjali Foods Ltd. (M = 34.41, SD = 23.762) but no significant difference was found with 3F Oil Palm Agrotech Pvt. Ltd. (M = 45.70, SD = 35.579) though with more productivity. There had been no significant difference between the mean level of productivity by the farmers under Patanjali Foods Ltd. and 3F Oil Palm Agrotech Ltd. (presently taken over by the Department of Agriculture, Govt. of Mizoram due to withdrawal of the company).

Table 5.34: Games Howell test on Productivity of Farmers under the Select 3 Companies

Multiple Comparisons						
Dependent Variable: Productivity in MT/Ha Games-Howell						
(I) Company	(J) Company	Mean Difference (I-J)	Std. Error	Sig.	99% Confidence Interval	
					Lower Bound	Upper Bound
Godrej Agroovet Ltd.	Patanjali Foods Ltd (Ruchi Soya)	22.785*	3.312	.000	14.95	30.62
	3F Oil Palm Agrotech Pvt. Ltd.	11.496	9.066	.430	-11.57	34.56
Patanjali Foods Ltd (Ruchi Soya)	Godrej Agroovet Ltd.	-22.785*	3.312	.000	-30.62	-14.95
	3F Oil Palm Agrotech Pvt. Ltd.	-11.289	9.257	.456	-34.69	12.11
3F Oil Palm Agrotech Pvt. Ltd.	Godrej Agroovet Ltd.	-11.496	9.066	.430	-34.56	11.57
	Patanjali Foods Ltd (Ruchi Soya)	11.289	9.257	.456	-12.11	34.69
*. The mean difference is significant at the 0.01 level.						

Source: Field Survey

5.9 Cost-Benefit Analysis

For the Cost Benefit Analysis, annual income from sale of FFBs and self-extracted oil were taken as benefit and an annual expenditures on maintenance including weeding, harvesting, transportation (manual labour & vehicle hiring costs), agricultural inputs (herbicides, pesticides, fertiliser) and other miscellaneous expenditures were taken as costs. The analysis is based on the data provided in Table 5.16, 5.22, 5.27, 5.32 and Figure 5.4. The initial cost of establishment such as cost of seedlings, cultivation cost, maintenance cost, etc., were provided under the scheme until the oil palm plants attained a productive age of 4 years. Therefore, the cost of establishment was not considered while calculating the cost-benefit ratio. At the same time, all the expenditures and income data were as provided by the farmers. It may be kept in mind that all the estimates were averages.

Labour costs includes the family labours and hired labours at a daily wage rate of Rs. 350.00 per day. Costs of hiring vehicle, herbicides, pesticides, fertilisers and other miscellaneous costs were added in the expenditure side. The total income (benefit) from oil palm was Rs. 1,98,05,445 while the total expenditure (cost) was Rs. 1,52,12,379 making a net income of Rs. 45,93,066 for the whole samples. The Cost-Benefit Ratio was calculated to be 1.3, which implies that for every Rs.100.00 expenditure, there was a benefit of Rs. 30.00 only.

Table 5.35: Cost-Benefit Analysis of Oil palm Cultivation

Sl. No.	Particulars	Value
1	Total Oil Palm Cultivation Area (in Ha)	740.27
2	Average Per Capita cultivated (in Ha)	2.60
3	Oil Palm Seedlings Planted	138079
4	Mature plants (Yielding)	80136 (58%)
5	Immature Plants (Non-yielding)	24724 (18%)
6	Mortality	33219 (24%)
7	Annual Fresh Fruit Bunches Production (MT)	2957.97
8	Production per Ha (Productivity=MT/Ha)	4.00
9	Annual Maintenance Cost	15212344.00
10	Annual Maintenance Cost per Ha	20550.00
11	Annual Income	19805445.00
12	Annual Income per Ha	26754.35
13	Cost-Benefit Ratio (CBR)	1.30

Source: Calculated based on the field survey data of 285 samples.

5.9.1 Profit and Loss Statement of the Sample Farmers

The study found the Benefit Cost Ratio of 1.3 implying an investment in oil palm cultivation is having a net profit of 30%. However, the expenditure incurred and the income accrued from oil palm cultivation of each and every farmer was studied in detail. Table 5.36 shows that 118 farmers or 41.4% were profiting from oil palm cultivation while majority of the sampled farmers comprising 167 farmers or 58.6% were incurring losses due to the oil palm cultivation. Amongst the profit-making farmers, the average profit or net income was Rs. 72,652; the minimum net income was Rs. 500.00 and the maximum net income was Rs. 10,66,415 whereas the total net profit was Rs. 85,72,926 only. At the same time the average amount of loss by 167 farmers was Rs. 23,832, the

minimum loss incurred was Rs. 500.00 and the maximum loss was Rs. 2,10,250 only. The total loss incurred by 167 farmers amounts to Rs. 39,79,860 only. The overall net profit from oil palm cultivation was Rs. 45,93,066 only.

The study finds that the average age of oil palm plantations was 9.73 years and considering the low productivity at 4.00 metric tonnes per ha with almost 60% of the farmers still incurring losses, the economic viability of the oil palm cultivation in the state is doubtful under the prevailing condition. Therefore, the State Government is advised to take necessary steps to find the solution.

Table 5.36: Profit and Loss Statement of the farmers

Indicator	Profit	Loss
No. of Farmers	118 (41.4%)	167 (58.6%)
Average (Rs.)	72652.00	-23,832.00
Minimum (Rs.)	500.00	-500.00
Maximum (Rs.)	10,66,415.00	-2,10,250.00
Total	**85,72,926.00**	**-39,79,860.00**
Net Income (Profit-Loss)	**4593066**	
Sample Size = 285 farmers who have produced Fresh Fruit Bunches		

Source: Calculated from Field Survey Data

5.10 Contribution of Government Schemes

In this section, the contribution of Government Schemes, viz., New Land Use Policy (NLUP) and the Mahatma Gandhi National Rural Employment Guarantee Scheme (Mahatma Gandhi NREGS) were highlighted.

5.10.1 New Land Use Policy (NLUP)

Among the sample farmers, 101 (35.44%) were beneficiaries of New Land Use Policy (NLUP), the erstwhile State Government Flagship Programme. The total financial assistance received by the farmers was Rs. 90,63,700 only and the average amount of assistance received was Rs. 89,740 only.

The assistance received from the NLUP were utilised by the farmers for hiring labour for weeding, construction of half-moon terrace, etc. The beneficiaries claimed that assistance has relieved much of the financial problems and it helped in better management of the farms. The area cultivated under NLUP

was 35.76% of the total cultivated area of the 285 sample farmers while the mature plants under NLUP comprised 38.9% of the total area and immature plants comprised 41.89% of the area under immature plants. However, the fresh fruit bunch production was just 34.65% of the total production of the sample farmers and gross income from oil palm by the beneficiaries comprised 33.1% of the gross income of the sample farmers. However, the contribution of the NLUP is substantial and is expected to increase with the maturity of the presently immature plants which comprised almost 25% of the live plants cultivated by the beneficiaries.

Table 5.37: Contribution of NLUP in Oil Palm Development

Particulars	NLUP	Figure for whole sample	% Share of NLUP
No. of Beneficiaries	101	285	35.44
Area of oil palm (ha)	264.7	740.27	35.76
Average area (ha)	2.62	2.6	-
Mature Plants	31176	80136	38.9
Immature Plants	10358	24724	41.89
Total Live Plants	41534	104860	39.61
FFB Harvest (MT)	1025	2957.97	34.65
Gross Income from oil palm (Rs.)	6555035	19805445	33.1

Source: Field Survey

5.10.2 Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)

Out of 285 respondents, 122 (42.81%) have benefited from Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) for management of their oil palm plantations in terms of cash or man-days. The total area of oil palm cultivation assisted under MGNREGS was 296.66 ha or 40.06 ha. The average oil palm area of the MGNREGS beneficiaries was 2.43 which was slightly lower than the average of the whole samples. Mature plants comprised only 34.44% of the total mature plants of the sample farmers and the fresh fruit bunch harvest was still lower at 31.38% with the gross income of the MGNREGs

beneficiaries being 31.66% of the total gross income of the total samples indicating less production by the MGNREGS beneficiaries. The lower production may be due to the reason that most of the beneficiaries of the MGNREGS were from the poorer sections of the society resulting in poor management of the plantation. However, the production is expected to increase on maturity of the immature plants which comprised 17.54% of the live plants or 21.27% of the live plants. At the present rate of production, on maturity of the immature plant could results in an increase of at least 21% of fresh fruit bunch production. At the same time, it is worthwhile to note that a large portion of the farmers comprising 42.81% have benefited from the MGNREGS.

Table 5.38: Contribution of MGNREGS in Oil Palm Development

Particulars	MGNREGS	Figure for whole sample	% Share of MGNREGS Beneficiaries
No. of Beneficiaries	122	285	42.81
Area of oil palm (ha)	296.55	740.27	40.06
Average area (ha)	2.43	2.6	-
Mature Plants	27597	80136	34.44
Immature Plants	5870	24724	23.14
Live Plants	33467	104860	31.92
FFB Harvest (MT)	9281.46	2957.97	31.38
Gross Income from oil palm (Rs.)	6269759	19805445	31.66

Source: Field Survey

5.10.3 Comparative Analysis of Beneficiaries by Schemes

In order to specify the number of dual beneficiaries, cross-tabulation was applied between the beneficiaries of NLUP and MGNREGS. Table 5.39 shows that 59 farmers (20.7%) have benefited from both the programmes while 122 farmers benefitted from MGNREGS, 101 farmers benefited from NLUP. There were 121 farmers (42.46%), who were neither the beneficiaries of MGNREGS nor NLUP.

Table 5.39: Crosstabulation of NLUP & MGNREGS Beneficiaries

Count		Assistance from MGNREGS		Total
		Yes	No	
Assistance from NLUP	Yes	59	42	101
	No	63	121	184
Total		**122**	**163**	**285**

Source: Field Survey

Field survey data were analysed to see the income level of the farmers by the schemes they availed. From Table 5.40, it could be seen that dual beneficiaries of MGNREGS & NLUP had lowest annual average income followed by beneficiaries of MGNREGS alone. Beneficiaries of NLUP had higher income than that of dual beneficiaries and that of MGNREGS. Those non-beneficiaries, i.e. those who depends on the Oil Palm Development Programmes alone fared much better in terms of gross annual income. The results indicate that government schemes alone does not guarantee success. However, those who availed the government scheme are generally poorer section of the society who need not only financial assistance but also guidance and supervision. At the same time, poor people need financial assistance not only for meeting their investment requirement but also for meeting their consumption needs.

Table 5.40: Comparison of Income by Assistance Received

Beneficiaries by Schemes	Frequency	Gross Annual Income (Rs.)	Gross Annual Average Income (Rs.)
Dual beneficiaries of MGNREGS & NLUP	59	3135987	53152
Beneficiaries of MGNREGS	122	6269759	51391
Beneficiaries of NLUP	101	6555035	64901
Non-Beneficiaries (only OPDP)	121	10116638	83609
OPDP = Oil Palm Development Programme			

Source: Calculated from Survey Data

5.11 Problems Faced by Oil Palm Contract Farmers

Mizoram state is a mountainous region with high rainfall during summer/monsoon season. Due to the topographic features, farmers encountered with various problems in management of their oil palm plantations. Oil palm cultivations were in small pockets in a sporadic manner, not following cluster system. The oil palm contract farmers cultivated oil palm in their pre-owned lands, many of which were not accessible by vehicles. Due to the sporadic pattern of the cultivation, various problems were faced by the farmers and they could not avail the benefits of backward and forward linkages in many parts. The main problems faced by the farmers were given in Table 5.41. The top five amongst the main problems cited by the farmers were Low rate of FFB (54.04%), Transportation Problem (22.11%), Financial Problems (14.39%), Wild Animal Attack (3.86%) and Lack of Technical Support (2.46%). The other problems cited by the farmers include Irregular Cash Transfer, Requirement of Harvesting Tools, Irregular Collection of FFB by the Company, Lack of Proper Training, Problems due to Long Trunk of the Oil Palm Trees, Negligence by the Department and Lack of Fertiliser.

Table 5.41: Main problems faced by the farmers

Main Problems	Frequency	Percent
Low rate	154	54.04
Transportation	63	22.11
Financial problems	41	14.39
Animal attack	11	3.86
Lack of technical support	7	2.46
Irregular cash transfer	3	1.05
Harvesting tools	1	0.35
Irregular collection of FFB	1	0.35
Lack of proper training	1	0.35
Long trunk	1	0.35
Negligence by the department	1	0.35
Lack of fertiliser	1	0.35
Total	**285**	**100.00**

Source: Field Survey

5.12 Comments from the Farmers

Comments of the farmers were collected and summarised in the following paragraph.

1. Almost half (44.56%) said that the procurement rate of oil palm fresh fruit bunch was very low and they could not meet the expenditure and asked for upward revision. In line with this, the rate of FFB had been increased to Rs. 10.00 per Kg. with effect from 1st April, 2022.
2. More than 30% of the farmers commented that they were facing transportation problem and demand all-weather road to collect their FFBs during the rainy season which is the peak season for harvesting the FFBs.
3. About 10% said that they were facing shortage or absence of fertiliser supply. They believed that sufficient fertiliser supply, even without subsidy, will help in increasing their production.
4. About 6% mentioned water problem and request provision of irrigation facility including water storage tank.
5. More than 5% of the farmers commented that they need regular and prompt transfer of funds for sale of their FFBs.
6. More than 3% mentioned the problems of animal attack on their plants and required plan protection equipment.
7. About 3% said that they were facing with problems in harvesting due to the tall tree for which they requested harvesting equipment.
8. Regular collection of FFBs and establishment of more collection centres for the convenience of the farmers.
9. Some farmers requested that FFBs should be collected from the fields where accessible by vehicle.
10. Construction of bridge to cross the river as many of the farmers cultivated in a land on the other side of the river banks.
11. Provision of soft loan for meeting the management expenditure which could be repaid from the sale of FFBs.
12. Oil Palm Census may be done through actual field verification by the officials or the leaders of the branch or Village Level Growers Society.
13. Some farmers mentioned the requirement of field supervision and training.

14. Some suggested that for fresh cultivation of oil palm, location should be carefully selected for easy access.

5.13 Summary

The present chapter deals with the various aspects of oil palm cultivation under the contract farming system in the state of Mizoram with the implementation of Oil Palm Act, 2004. The study analysed palm oil supply chain in Mizoram, performance of the sponsor, source of information about contract farming, source of financing oil palm cultivation, socio-economic conditions of the farmers, performance of contract farmers, cost-benefit analysis, contribution of Government schemes, problems faced by the oil palm contract farmers and comments from the farmers. Some of the major points may be highlighted from the above analysis:

First, Godrej Agrovet Ltd. remains the sole company having established Palm Oil Mill in the state and the Crude Palm Oil (CPO) produced was sold to the refineries in Kolkata through brokers as there is no refinery in Mizoram.

Second, 3F Oil Palm Agrotech Pvt. Ltd. had withdrawn from the contract and Ruchi Soya Ltd. had been taken over by Patanjali Foods Ltd. with effect from 24th June, 2022. The total FFBs sold to the partner companies was 37,272.822 metric tonnes as on July, 2022. The study finds that Patanjali Foods Ltd. was having the largest number of farmers among the companies. However, the FFBs purchased by Godrej Agrovet Ltd. was significantly higher than that of Patanjali Foods during the three-year period (2018-19 to 2020-21).

Third, the Price Fixation Committee fixed the price of FFB at Rs.10.00 per kg with effect from 1st April, 2022. However, the price formula of the Central Government was proposed to be adopted for calculation of the price of FFB and the price was Rs.10.81 per kg in December, 2022. This is expected to be encouraging the farmers to take up oil palm cultivation with enthusiasm which in turn will increase the production of FFBs.

Fourth, the main source of information about contract farming was Agriculture Department of the state while private savings was the main source of

financing oil palm cultivation for 77.9% of the farmers followed by subsidy given by the government.

Fifth, the oil palm contract farmers were rather old with an average age of 58.84 years and 91.2% were male. Among the respondents, 3.9% were illiterate and those who were having primary and middle education formed 67.3% of the respondents. Most of the farmers (81.8%) were married and 60.7% were from above poverty line families. Only 1.85% were having kutcha house while 82.1% were having semi-pucca house. Majority of the farmers comprising 59.3 were having the Village Council Pass (which was allotted by the Village Councils) while only 0.4% was leasing the land from others. The socio-economic factors does not have significant impact on the quantity of FFB produced.

Sixth, the oil palm farmers were found to have multiple sources of income and oil palm farming was used as main source of income by 37.5% only while 12.6% were still practicing shifting cultivation as their main source of income and 10.9% were still depending on wage labour as their main source of livelihood.

Seventh, out of the total landholdings of the respondents, 52.91% was utilised for cultivation of oil palm and the average oil palm cultivated area was 2.60 ha per farmer. Out of the total number of oil palm seedlings planted, 58% were mature and the mortality rate was very high at 24%.

Eight, irrigation was practised by 7.7% only while the input quantities of herbicides, insecticides and fertilisers were also very low resulting in low productivity. However, fertilisers and herbicides were having positive significant impact on the quantity of FFB harvested. Training was attended by 88.8% of the farmers and training have significant impact on the productivity.

Ninth, it is striking to find that 56.5% of the plantations had never been visited by officials of the Agriculture Department or the Company and only 33% of the farmers were satisfied with the performance of the company.

Tenth, the average distance of the collection centres from the oil palm plantation was 2.46 kilometres which posed problems for the farmers while 48.4% of the farms were not accessible by vehicles.

Eleventh, Production of FFBs by the farmers under Godrej Agrovet Ltd. was significantly higher than the production by farmers under Patanjali Foods Ltd.

and 3F Oil Palm Agrotech Pvt. Ltd. However, in terms of productivity, significant difference is found between the farmers under Godrej Agrovet Ltd. and farmers under Patanjali Foods Ltd. but not with farmers under 3F Oil Palm Agrotech Pvt. Ltd.

Twelfth, the overall cost-benefit ratio was found to be 1.3, implying the oil palm cultivation was profitable. However, in depth study shows that 58.6% of the farmers were incurring loss.

Thirteenth, the State Government schemes like New Land Use Policy (NLUP) and the Mahatma Gandhi National Rural Employment Guarantee Schemes of the Central Government were contributing to the extension of the oil palm area and the number of farmers. However, there were no significant impact on the production of the FFBs.

Fourteenth, the top five amongst the problems faced by oil palm farmers were low price of FFB, transportation problem, financial problems, animal attack and lack of technical support. With the adoption of the Price formula of the Ministry based on the international Crude Palm Oil price, the first problem is likely to be solved. Transportation needs to be addressed to ensure that farmers are reaping the benefits of oil palm cultivation. Much of the financial problems will be solved with the price revision and in addition, soft loans may be provided to the farmers in need. In order to ward off wild animals, equipment need to be provided for protection of the young plants. Besides training, farmers have to be visited by officials in their fields for technical guidance.

CHAPTER – 6

FINDINGS, CONCLUSIONS AND SUGGESTIONS

CHAPTER 6
FINDINGS, CONCLUSION AND SUGGESTIONS

Contract farming has been practiced in various parts of the world with mixed results. Some researchers found that adoption of improved technology under contract farming have positive effect and boost yield or income (Harish, 2019; Rondhi et al., 2020, Beggs et al., 2013). Contract farming leads to increase in productivity (Dubbert, 2019; Herdiansyah et al., 2020). Formal contract farmers are having more technical efficiency that those of informal or non-contract farmers (Kusnadia & Paramitab, 2019; Alulu et al., 2021). Oil palm contract farming was also found to result in increased farmer's income in many instances (Owolarafe et al., 2007; Damoah, 2012; Beggs et al., 2013) while intensification of land use was suggested to increase land use efficiency (Sari et al., 2021). Non-compliance of recommended technical standards caused lower productivity among small holders (Anwar et al., 2014); inefficiency of land use by small holder oil palm plantations do more harm than the benefits accrue from it (Sari et al., 2021); productivity constraint by low soil nutrients was also observed (Rhebengen et al., 2016); contract farming is ineffective as a development approach to connect small scale farmers to profitable agriculture market (Musa et al., 2018).

From the above literatures, it can be seen that contract farming, though without criticism, is an important tool for the development of small farmers. In the light of the above studies, oil palm contract farming practice in the state is studied and the findings, conclusions and suggestions are presented in this chapter.

6.1 FINDINGS

The findings of the research is further divided into two sections, viz., findings in relation to the study objectives and findings to prove the research hypotheses.

6.1.1 Findings in Relation to Study Objectives

Objective 1: *To examine the socio-economic profile of the oil palm contract growers*

1. The mean age of the oil palm farmers in the state was 59 years which shows that the farmers were rather old and beyond active economic age.

2. The respondents' families were having 54.71% of their members as working population.
3. Among the respondents, 91.2% were male and female comprised only 8.8%.
4. The highest number of respondents (38.9%) were having middle level education followed by Primary education (28.4%), high school education (21.8%), higher secondary education (5.3%), illiterate (3.9%) and graduate and above (1.8%).
5. Only 4.6% of the respondents were single or unmarried, majority of the farmers (81.8%) were married, 4.9% were divorcees and 8.8% were widows or widowers.
6. The highest number of respondents (60.7%) were from Above Poverty Line (APL) families while 30.9% were from Below Poverty Line (BPL) families and 8.4% were from Antyodaya Anna Yojana (AAY) families.
7. Most of the respondents were having semi-pucca houses, 16.1% were having pucca houses while 1.8% were having kutcha houses.
8. Most of the land ownership (59.3%) were under Village Council (VC) Pass, Periodic Patta (33.7%) and only 6.7% were having Land Settlement Certificate (LSC), which was permanent ownership. Only 0.4% were leasing land from others.
9. Regarding the suitability of their lands for cultivation, 19.3% of the farmers graded their lands as moderately suitable, 66.7% graded suitable and only 14% graded it as very suitable.
10. Besides oil palm cultivation, the other top 5 important occupations of the farmers were other plantations (36.1%), wage labour (26.3%), livestock farming (20.4%), shifting cultivation (20%) and seasonal farming (12.6%).
11. Main source of income of the oil palm farmers was asked and only 37.5% were using oil palm cultivation as their main source of income while 12.6% were having shifting cultivation as their main source of income, 10.9% were using wage labour as their main source of income, 8.4% used government service as their main source of income and 6.7% were having seasonal farming as their main source of income.

12. The average area of total landholdings of the oil palm farmers was 4.91 ha, average oil palm cultivated area was 2.6 ha, other copped area was 1.1 ha, while area kept as forest was 1.22 ha per farmer. Here, it could be observed that about 52.95% of the total landholdings was utilised for cultivation of oil palm.
13. The total oil palm cultivated area of all the respondents was 740.27 ha with an average cultivated area per farmer was 2.6 ha.
14. Oil palm cultivation in Mizoram was started on experimental basis in 1997 at Rotlang, Lunglei district and Thingdawl, Kolasib district. Commercial cultivation was started since 2005. Among the respondents, the highest number of respondents were those who started oil palm cultivation in the year 2007. There were large number of farmers who joined the oil palm contract farming in 2008 and 2009. However, the numbers of new farmers who joined in remained low afterwards.
15. Among oil palm plants of the respondents, 58% were mature, i.e. bearing fruits, 18% were immature, i.e. not yet bearing fruits, while the mortality rate was surprisingly high at 24% of the oil palm seedling planted. The various reasons of the death of plants include animal attack, uprooting of the plants, etc.

Objective 2: *To identify the inputs (materials and technical) provided to the farmers*

1) Godrej Agrovet Ltd. and Patanjali Foods Ltd. did not provide material inputs, however, they claimed that they have provided technical inputs by visiting the farms or though trainings. Godrej Agrovet Ltd. claimed that they provided fertilisers on demonstration purposes in some cases.
2) The Department of Agriculture, Government of Mizoram provided various kinds of assistance to the farmers including oil palm seedlings purchased from the companies, cultivation cost, maintenance cost, cost for half-moon terrace, water pipe and drip irrigation, cost for water tank, harvesting tools, gloves, guide book, etc. The distribution of assistance to the farmers appears to be uneven as some of the farmers have stated that they did not receive assistance as per their performance.

3) Among the farmers, 11.2% have not attended trainings and 56.5% of the oil palm farmers stated that their plantations had never been visited by the officials from the company or the Agriculture Department.
4) The oil palm seedlings received were graded 'Good' by 88.8% of the farmers.
5) Oil palm seedling were received by 35.8% in the 'planting season', 61.8% received 'before the planting season' and 1.1% received 'late' while 1.4% had 'no idea'.

From the above findings, it could be seen that there is room for improvement in relation to the provision of the inputs (materials and technical), for the development of oil palm cultivation under the contract farming system.

Objective 3: *To analyse the performance of contract farmers to comply with contract requirements.*

1) While all the contract farmers were supposed to attend the training on oil palm management conducted by the Agriculture Department or by the company, 11.2% did not attend the training as mentioned above.
2) Only about 60% of the farmers planted at the recommended triangular spacing of 9m X 9m X 9m distance, which could affect the production of FFB. Some of the farmers claimed that they have already planted the oil palm seedlings before attending the training.
3) Inter-cropping was practised by 57.2% of the farmers. while this could generate additional income to the farmers, most of the inter-crops were perennial crops, which could compete with the oil palm trees when they grow big.
4) Almost 13% of the farmers have uprooted a total number of 1,667 oil palm trees due to reasons like less spacing, opted for another crop, location problem, for construction of power-line, construction of road, tall trunk and low price of FFBs without consent from the company or the Department of Agriculture.
5) Irrigation was practised by 7.7% only and minimal quantities of agricultural inputs were applied by the farmers. Herbicides was applied by 57.19% of the farmers with the inputs per ha was 2.07 litres only; insecticide was applied by

4.21% of the farmers with 0.072 litres per ha and fertiliser was applied by 53.3% of the farmers with 0.56 quintals per ha. Out of the total annual expenditure on oil palm cultivation, the share of fertilisers was very less at 5.39% only.

6) Palm oil was extracted by 7% of the farmers by themselves and sold the oil from which they claimed that they could get more money than selling the FFB to the company. This is against the contract terms which impels that all the FFBs should be sold to the concerned company only. However, the low rate of FFB and problems in transporting the FFBs were said to be the causes behind the self-extraction of palm oil by the farmers.

From the above observations, it is could be seen that the performance of the farmers also need improvement through technical guidance, proper monitoring and addressing the problems encountered by them.

Objective 4: *To assess the performance of contracting firms in the delivery of materials and services.*

1) As mentioned under *objective 2*, contracting firms/companies provided technical support to the farmers and did not provide materials to the farmers, except for fertilisers provided by Godrej Agrovet Ltd. to some farmers on demonstration purposes.
2) Seedlings were supplied to the farmers through the Department of Agriculture and some of the seedlings provided were older than 18 months of age due to spill over from the previous years. In some cases, oil palm seedling were supplied to the farmers before or after planting season, affecting the growth and survival of the oil palm plants.
3) While the companies were expected to establish collection centres in each village, due problems in accessibility, collection centres were not established in some villages and in that case the farmers shared the collection centres with the nearby villages. The average distance of collection centre from the plantation was 2.46 kilometres implying that farmers had to incur large amount of money on transportation making harvesting of FFBs uneconomical.

4) Weighbridge were not installed in most of the collection centres which was creating doubts in the minds of the farmers. However, the companies claimed that they could not install weighbridge due to the low volume of the FFBs.
5) Some farmers complained about rejection of the FFBs by the companies while the officials from the companies said that only unripe FFBs were rejected. Some farmers complained of non-collection of FFBs by the companies and there were cases where farmers complained about delayed payments from the company.
6) Only 33% of the farmers were satisfied with the performance of the companies.

It could be seen that the contracting companies also have good scope for improving their performance which would further boost the performance of the farmers.

Objective 5: *To evaluate the operational and institutional constraints for the success of contract farming*

1) The companies claimed that they were not facing an institutional constraints while they mentioned that unavailable support price, topographical conditions along with poor infrastructure like road connectivity, etc. were amongst the operational constraints. An official from Godrej Agrovet Ltd. said that around 20% of the farmers' produce could not reach the factory due to poor accessibility (DIPR, 2022). At the same time, low adoption of technology and poor care of plantations by the farmers were also posing problems in production of oil palm fresh fruit bunches.
2) Many farmers were having problems of transportation due to poor roads or absence of roads connecting to the plantations. In addition, the average distance of collection centres of FFBs from the plantations was 2.46 km which increase expenditures of the farmers. Barely more than half (51.6%) of the plantations were accessible by vehicles while 48.4% were not accessible. Out of an annual labour force spent on management of oil palm farms, 23.1% was used for transportation of the FFBs, which shows the

genuineness of transportation problem faced by the oil palm farmers and the requirement for improvement of roads.

3) During the time of field survey, the low rate of FFB was the main problem resulting in discouragement of the farmers from giving their best effort and subsequently leading to financial problems. After, revision of the price with effect from the 1st April, 2022 and subsequent adoption of the Central Price Formula, farmers are now working on their farms with new zeal and it is expected to result in much higher production of fresh fruit bunches.

6.1.2 Findings in relation to Research Hypotheses

The study tested 7 null hypotheses and the results are given in this section.

Hypothesis 1: *Socio-economic conditions of the oil palm contract farmers do not have significant impact on the quantity of the fresh fruit bunch (FFB) production.*

The impact of the socio-economic parameters like age, gender, educational level, marital status and economic status of the family on the quantity of FFB harvested were tested using multiple regression analysis. The ANOVA table exhibit [F (5,279) = 2.043, p = .073 > .05] with an R^2 of .035, which implies that the socio-economic factors are not good predictors of the quantity of FFB harvest or in other words, the socio-economic factors under analysis do not have significant impact on the quantity of FFB harvest.

Therefore, we failed to reject hypothesis 1, which states that "*Socio-economic conditions of the oil palm contract farmers do not have significant impact on the quantity of the fresh fruit bunch (FFB) production"*.

Hypothesis 2: *Trainings provided to the farmers does not have significant impact on the production of FFB.*

An independent samples t-test result shows that the average production of those who attended trainings (M = 51.84, SD = 28.322) was significantly higher than those who did not attend trainings (M = 37.09, SD = 26.126) conditions, t (282) = 2.799, p = .005.

Therefore, hypothesis 2, which states that the "*trainings provided to the farmers does not have significant impact on the production of FFB"* is rejected.

Hypothesis 3: *Trainings provided to the farmers does not have significant impact on the productivity of FFB.*

The average productivity of those who attended the training and those who did not attend the training was tested using an independent samples t-test, which shows that the average productivity of those who had attended the trainings (M = 51.63, SD = 28.538) was much higher than that of those who did not attend the trainings (M = 39.00, SD = 24.553) conditions, t (282) = 2.393, p = .017.

Therefore, hypothesis 3, which states that *"trainings provided to the farmers does not have significant impact on the productivity of FFB"* is rejected.

Hypothesis 4: *There is no significant difference in production of FFB among the contract farmers under the selected 3 companies.*

A one-way ANOVA was conducted to compare the effect of the companies' performance viz., Godrej Agrovet Ltd., Patanjali Foods Ltd. and 3F Oil Palm Agrotech Ltd. on the quantity of FFB produced by the farmers. There was significant difference in the amount of FFBs produced by farmers under the three companies at the p = .01 level for the three conditions [F(2,281) = 28.411, p = .0001]. Post hoc comparison using Games-Howell test indicated that the mean score for the farmers under Godrej Agrovet Ltd. (M = 58.48, SD = 26.468) was significantly higher than Patanjali Foods Ltd. . (M = 34.54, SD = 23.114) and 3F Oil Palm Agrotech Pvt. Ltd. (M = 31.26, SD =32.60). However, there had been no significant difference between the mean level of FFB production by the farmers under Patanjali Foods Ltd. and 3F Oil Palm Agrotech Ltd. (presently taken over by the Department of Agriculture, Govt. of Mizoram due to withdrawal of the company). Farmers under Godrej Agrovet Ltd. had produced significantly more than the farmers under Patanjali and 3 F Oil Palm Agrotech Ltd.

Therefore, hypothesis 4 stating that *"there is no significant difference in production of FFB among the contract farmers under the selected companies"* is rejected.

Hypothesis 5: *There is no significant difference in productivity of FFB among the contract farmers under the selected 3 companies*.

A one-way ANOVA shows that there was significant difference in the productivity of the farmers under the three companies at the p = .01 level for the three conditions [F(2,281) = 20.521, p = .000001]. However, post hoc comparison using Games-Howell test indicated that the mean productivity of the farmers under Godrej Agrovet Ltd. (M = 57.19, SD = 26.483) was significantly higher than Patanjali Foods Ltd. (M = 34.41, SD = 23.762) but no significant difference with 3F Oil Palm Agrotech Pvt. Ltd. (M = 45.70, SD = 35.579) though with more productivity. There had been no significant difference between the mean level of productivity by the farmers under Patanjali Foods Ltd. and 3F Oil Palm Agrotech Ltd.

From the ANOVA results, hypothesis 5, which states that *"there is no significant difference in productivity of FFB among the contract farmers under the selected 3 companies"* is rejected and it may be said that there is significant difference in the productivity of FFB among the contract farmers under the selected 3 companies.

Hypothesis 6: *Contract farming does not result in significant improvement in the productivity of the contract farmers.*

The average age of oil palm plantations was 9.73 years. According to the "*Oil Palm Development Programme in Mizoram*" issued by the Department of Agriculture, Govt. of Mizoram on its website (n.d.), the productivity of oil palm tree at the age of 9 years was 18 metric tonnes of FFBs per ha per year. The average production at age 4 is also 5 metric tonnes per ha per year which have not been achieved with the present production of 4.00 metric tonnes per ha per year. The achievement was 22.22% of the target productivity and the Z-statistics was not significant in case of improvement in productivity (Ho: P=0.50 & H_1 : P>.50). Therefore, we failed to reject the hypothesis stating that *"contract farming does not result in significant improvement in the productivity of the contract farmers"*.

Hypothesis 7: *There is no significant effect of the farm's accessibility to the FFB production of the contract farmers.*

The impact of farms' accessibility on the quantity of FFBs harvest was tested using independent samples t-test. The results shows that the FFBs harvested by those farms accessible by vehicles (M = 53.66, SD = 30.30) was significantly higher than those farms which were not accessible by vehicles (M = 46.50, SD = 25.90) conditions; t (282) = 2.136, p = .034, where equal variances are assumed. It can be said that accessibility of the farm land/plantation by vehicle has significant impact on the production of FFBs at .05 level.

Therefore, hypothesis no 7, which states that *"there is no significant effect of the farm's accessibility on the FFB production of the contract farmers"* is rejected.

6.2 CONCLUSION

The present study reveals that the pace of oil palm cultivation under contract farming has been decelerated due to the problems encountered by the farmers and only around 25% of the farmers intended to plant more oil palm trees. At the same time, only about 37.5% utilised oil palm as their main source of income. While the cost-benefit ratio was found to be 1.30, an in-depth study found that more than 50% of the farmers have been incurring losses. At the same time, the revision of price of FFB with effect from 1st April, 2022 and subsequent adoption of Central Price Formula is showing positive results in the minds of the farmers. The average productivity of 4 metric tonnes per ha was only 22.22% of the anticipated productivity (18mt/ha/yr.) in the state. This indicates that the low agricultural inputs application and the problems of transportation need prior attention. The study finds that the performance of Godrej Agrovet Ltd., having established palm oil mill, was better in terms of production and productivity than Patanjali Foods Ltd. and 3F Oil Palm Agrotech Pvt. Ltd. who have not yet establish palm oil mill. This indicates that the establishment of mill gives assurance of the market to the farmers which enhanced production and productivity. Area expansion or intensification of oil palm cultivation requires developed transportation system which could be achieved only if cluster approach is followed, where forward and backward linkages could be assured.

6.3 SUGGESTIONS

6.3.1 General

Palm oil mill has to be established by every contracting firms for extraction of palm oil purchased from their farmers, for which Rs. 2.5 crore for each had been allocated from the Oil Palm Development Programme. However, only Godrej Agrovet Ltd. had established the mill and Patanjali Foods Ltd. should also take necessary action for establishment of the same to give assurance to the farmers. In order to reduce the burden of transportation for the farmers, the present average distance of the collection centre has to be reduced by establishing collection centres by the companies in all the oil palm growing villages so that all the oil palm farmers will have an equal chance to sell their FFBs. For wide dissemination of information about oil palm cultivation and best management practices to achieve higher production and productivity, social media should be utilised through advertisement and broadcasting of success stories, best management practices, etc. under the National Mission on Edible Oils - Oil Palm (NMEO-OP) and other schemes of the government.

6.3.2 Socio-economic Factors

The mean age of the oil palm contract farmers in the state was 59 years which was beyond the active economic age. In order to give vigour to the sector, more involvement of the youth and women should be encouraged.

6.3.3 Performance of the contract farmers

Oil palm cultivation has been used as main source of occupation by 37.5% only and the reason behind this slow pace of development need to be studied and rectified for the success of the programme. The average cultivated area of 2.6 ha need to be enhanced to make it an economic activity to attract prospective farmers. The high mortality rate of oil palm plants at 24% is of serious concern and immediate action need to be taken. Inter-crop plants of annual or seasonal varieties may be promoted which could give immediate returns to the farmers on the one hand and which would not compete for space with the oil palm plants in the long run.

6.3.4 Performance of the Contracting Firms

It has also been learnt that some of the oil palm seedlings given to the farmers were older than the recommended age of 18 months and some farmers received the

seedlings during the off season. In order to avoid all these complications, the Department of Agriculture and the companies should conduct joint monitoring and census of oil palm trees should be done in the fields of the farmers by spot verification and new demand for the seedling for gap filling and fresh plantation should also be checked properly.

Farmers should be taught the importance and correct use of agricultural inputs. The company or the department should run an agricultural store at least in a district headquarters or headquarters of Agricultural Circle to ensure that farmers were not devoid of important inputs. It should be ensured that the assistance provided by the Department reach the target farmers. Trainings should not be taken lightly, not as a one-day programme, but as a continuous process in the form of visiting farms or exposure tour for farmers within or outside state to learn from the best performers.

6.3.5 Opportunity

With the implementation of the National Mission on Edible Oils- Oil Palm, with its special package for the North Eastern States, it is expected much of the problems previously faced by the farmers will be settled. Due to the difficult terrain in the region with high rainfall, there are lots of area-specific problems being faced. The Ministry may consider special package for the north eastern hill states for provision of agricultural link roads connecting the oil palm farms with all-weather roads, as earthen roads alone cannot cater the need as it could not be used during the monsoon season during which most of the FFBs were produced. Cluster approach have to be followed for achieving backward and forward linkages. Direct fund flow to the implementing department will also hasten the works and this will help in addressing the problems of the farmers in less time.

With implementation of the new price of the FFB and the adoption of the Central Price Formula, based on the International Crude Palm Oil price, many farmers are coming back with new zeal and vigour. The production of FFB is expected to increase considerably within few years-time. The cultivated area of Mamit and Kolasib put together as on July 2021 was 12,745 ha, taking an average productivity of 4 year-old plantations at 5 metric tonnes of FFB per ha per year, the total annual FFB production could be 63,725 metric tonnes, which will be beyond the

capacity of palm oil mill established by Godrej Agrovet Ltd. Therefore, it is clear that addressing the problems being encountered by the farmers should be given priority before area expansion.

6.4 LIMITATIONS OF THE STUDY

The study present study is not free from limitations and some of them are highlighted in this section. There are no non-contract growers of oil palm in the state. Therefore, productivity of the oil palm farmers in the state was compared with the productivity as per the chart provided by the Department of Agriculture, Government of Mizoram, which could show the existing gap in the present practice in the state. Detailed information regarding the materials and services could not be provided by the department nor the companies. Therefore, the responses from the farmers are considered in this case. Lack of records by the farmers makes it difficult to get accurate data. However, the sale of FFB was recorded by most of the society at the village level while the equipment and services offered by the department or the company were not properly recorded. Many of the responses were given by them as per their memories. The study had been conducted in 2019 and due to the time lapsed, the present situation might have been changed.

In spite of the above and other limitations faced in this study, it is hoped that the research findings will give light on the status of contract farming in the state and is expected to provide a reference to the academicians and policy makers to follow the right track.

6.5 SCOPE FOR FURTHER RESEARCH

The following areas are suggested for further studies:

1. In order to throw more light on the development of oil palm plantation in the country in general and in Mizoram, in particular, it is suggested to study the environmental and ecological impact of oil palm cultivation. The study will help in application of better cultivation practices and will mitigate the adverse impact of the oil palm cultivation.

2. Scientific studies on oil palm cultivation practices in Mizoram to attain best management practices and to fill the yield gap is suggested.
3. An in-depth study on the present areas of cultivation by the agricultuaral experts with scientific inputs and clusterization of the plantations for achieving backward and forward linkages is an area needing an urgent attention.

ANNEXURES

ANNEXURE – I

INTERVIEW SCHEDULE FOR OIL PALM FARMERS

Schedule No: _____ Date:___ _____

Name of the Field Investigator: _____ Signature: _____

The interview schedule is prepared to examine the performance of oil palm contract farmers under the contract farming system in the state. At the same time, the problems faced by the farmers will also be identified and suggestions for improvement will be sought. Your support will be valuable for the success of the study and confidentiality of your identity will be preserved.

`

Name of the Village: _____, Block:_____, District: _____

Section A: Socio-economic Indicators:

1. Name of family head: _____ Ph No: _____
2. Marital status: 1. Married 2. Single 3. Divorcee 4. Widow/widower
3. Sex : 1. Male 2. Female
4. Age : _____
5. Education: 1. Illiterate, 2. Primary, 3. Middle, 4. H/S, 5. HSS, 6. Graduate & above
6. No. of family members : _____
7. No. of Workers : _____
8. No. of female workers : _____
9. No. of male workers : _____
10. No. of dependent : _____
11. Family Economic Status: 1. AAY, 2. BPL, 3. APL, 4. Others
12. Housing Status: 1. Kutcha House, 2. Semi-Pucca House 3. Pucca House
13. Main Source of Income?: _____
14. Tick your source of income; please write if you have another source:

    1. Other Plantation, 2- Animal rearing, 3- Seasonal crop,4-Shifting cultivation

    5- Govt. Job, 6- Petty Trade 7. Pensions, 8. Driving, 9. Daily wage earner

    10. Sand/Stone Quarry 11. Others_____ _____

Section B: Land holdings (in hectare)

15. Total landholdings (ha): _____

16. Oil Palm cultivated area (ha): _____

17. Other cropped area (ha):_____

18. Forest / Reserve (ha): _____

19. Ownership status of oil palm cultivated area:

    1. LSC, 2. Periodic Patta, 3. VC Pass, 4. Leased from others

Section C: Status of Oil Palm tree & Management:

20. Year of planting : _____

21. No. planted : _____

22. No. of Mature trees : _____

23. No. of Immature trees : _____

24. No. of dead trees : _____

25. Oil Palm spacing:

    1. 9m x 9m x 9m below; 2. 9m x 9m x 9m exactly; 3. 9m x 9m x 9m above

26. Suitability of land for Oil Palm (slope & fertility as perceived by the farmer):

    1. Very Good 2. Good 3. Fair 4. Not fit

27. Do you practice inter-cropping?: 1. Yes 2. No

28. What are the crops?: _____

29. Do you irrigate your plants? : 1. Yes 2. No

30. Did you uproot oil palm tree? : 1. Yes 2. No

31. How many trees? : _____

32. Reasons for uprooting:

    1. Due to less spacing, 2. Scheme implementation is not satisfactory
    3. Financial problem 4. Go for more productive crop
    5. Other reasons: _____

33. Do you think Oil Palm cultivation is profitable?: 1. Yes 2. No

34. Are you planning to plant more Oil Palm trees?: 1. Yes 2. No

35. Reasons for your decision:_____

Section D: Annual labour involvement & Agricultural Input:

36. Weeding (man-days): _____

Family Labour: _____ , Hired labour: _____

37. Herbicide in litres: _____ (Rs._____)
38. Pesticides in litres: _____ (Rs._____)
39. Fertiliser in Quintals: _____ (Rs._____)
40. Harvesting Oil Palm FFB (man-days): _____

    Family Labour: _____ Hired Labour: _____
41. Vehicle hiring for transportation of FFBs: Rs. _____
42. Transport of FFBs

    Family Labour: _____ Hired Labour_____
43. Any other expenses for oil palm management: Rs._____

Section E: Production & Marketing: (Annual)

44. Oil Palm FFB harvested (Kg/Quintal): _____
45. Oil Palm FFB sold (Kg/Quintal): _____(Rs._____)
46. Oil Palm self-processed for oil extraction (KG/Qtl): _____ (Rs._____)
47. Family income from sources other than oil palm : Rs. _____
48. Source of funds for management of oil palm farm:

    1. Own savings, 2.Subsidy, 3. MGNREGA, 4. NLUP/NEDP,

    5. Bank Loan, 6. Others:

Section F: Government Intervention:

I. Oil Palm Contract farming:

49. How did you come to know about Contract Farming?:

    1. Agriculture Dept., 2. Company, 3. Newspaper, 4. Friends 5. TV. 6. Others
50. Did the Company satisfy their responsibilities?: 1. Yes 2. No
51. What is the quality of oil palm seedlings distributed?: 1. Good 2. Not Good
52. Did you receive seedling during planting season?: 1. On season 2. Somewhat late, 3. Somewhat early
53. Did you attend training on planting and management?: 1. Yes 2. No
54. How long was the Training?: 1. Half day 2. One day 3. two days 4. ____
55. Is training quality good?: 1. Yes 2. No
56. Is training effective?: 1. Very much, 2. effective. 3. not effective
57. No. of visit of Company/govt. officials during the last one year?: _____
58. Accessibility of farm by vehicle? : 1. Yes 2. No

59. Distance of Collection Centre from your farm? km _____

60. What is the frequency of FFB collection by the Company?:

1- Weekly 2- Bi-weekly 3- Monthly 4- Not applicable

61. Assistance and guidance received from the Company:_____

62. Are you satisfied with the Company's performance? _____

II. NLUP/NEDP:

63. Did you receive assistance from NLUP/NEDP? : 1. Yes 2.No

64. Amount: Rs. _____

65. Improvement caused to your Oil Palm plantation? : 1. Yes 2. No

66. Did you benefit from NLUP/NEDP? Please discuss: _____

IV. MGNREGS:

67. Assistance from MGNREGS? 1. Yes 2.No

68. Cash : Rs. _____

69. Labour/Man-days?: _____

70. For what works/purpose? : _____

71. Please state how you benefit from it. _____

Section G: Problems faced by Oil Palm Contract Growers:

72. What are your problems: 1. Financial, 2.Transportation/road,

3. Low price of FFB 4. Lack of Technical Assistance. 5. Pest & Diseases

6. Wild animal Attack 7. Others_____

73. Biggest problem from above?

74. Your suggestions for improvement in the oil palm cultivation and production.

_____

75. Investigator's Comments: _____

ANNEXURE - II

THE MIZORAM OIL PALM

(*Regulation of Production and Processing*) Act. 2004

The Mizoram Gazette
EXTRA ORDINARY
Published by Authority

REGN. NO. N.E. - 313 (MZ)

Vol. XXXIII Aizawl, Tuesday, 14.12.2004, Agrahayana 23, S.E. 1926, Issue No. 36

NOTIFICATION

No. A. 10218/141/04-LJD/21, the 8th December, 2004. The following Act of the Mizoram Legislative Assembly which received the assent of the Governor of Mizoram is hereby published for general information

The Mizoram Oil Palm (Regulaltion of Production and Processing) Act. 2004 (Act. No.10 of 2004)

Received the assent of the Governor of Mizoram on the 2nd December, 2004

AN
ACT

to provide for the Regulation of Cultivation of Oil Palm and for orderly growth and processing thereof and for matters connected therewith.

It is enacted by the Legislative Assembly of the State of Mizoram in the Fifty Fifth Year of the Republic of India as follows :-

Short title, extent and comencement

1. 1) This act may be called the Mizoram Oil Palm (Regulation of Production and Processing) Act, 2004

2) It extends to whole of the State of Mizoram except the areas constituted as autonomous districts under the sixth schedule to the constitution of India

3) It shall come into force from such date as may be notified by the Sate Governmet in the official Gazette.

Definition

2. In this Act, unless the context otherwise requires,

1) "Advisory Committee" means the Mizoram Oil Palm Advisory Committee constitution under Section 3;

2) "Factory" means any premises including the precincts therof or any part of which any manufacturing process connected with the processing of Oil Palm FFB is carried on with the aid of mechanical power;

3) "Factory Zone" means an area assigned to a factory under section 11;

4) "Government" means the State Government of Mizoram

5) "Occupier of the factory" means the person who, or the authority which has the ultimate control over and where the said affairs are entrusted to a Seretary, Manager, Managing Director, Executive Director or Chief Executive Director, such Secretary, Manager, Managing Director, Executive Director or Chief Executive Director shall be deemed to be the occupier of the factory;

6) "Oil Palm" means the palm of the genus, Elacis and includes the species, Elaeis guineensis, Malanococcea or Corozo oleifera and hybrids of these species;

7) "Oil Palm Officer" means the Oil Palm Officer appointed under section 8;

8) "Oil Palm FFB" Means, the unprocessed Oil Palm fresh fruit bunch and includes its loose form also;

9) "Oil Palm Grower" means a person who cultivates oil palm whether by himself or by his own servants or by hired lobour or by members of his family or by his tenants and includes Oil Palm Growers Cooperative Society, but not a member thereof and a Company as defined in section 3 of the Companies Act, 1956 (Central Act 1 of 1956);

10) "Oil Palm Growers Cooperative Society" means a Society registered under the Mizoram Cooperative Societies Act, 1991 (Mizoram Act 1991) which has among its objects and functions the cultivation and sale of oil palm FFB by its members, and includes the Federation of any such Societies.

11) "Oil Palm Inspector" means the Oil Palm Inspector appointed under section 9;

12) "Oil Palm Product" means any prodect obtained directly from the oil palm and it includes palm oil, palm kernel; palm kernel cake, palm fatty acids, oil palm seeds and oil palm seedlings.

13) "Prescribed" means prescribed by rules made under this Act

14) "Zonal Committee" means a Zonal Committee constituted under section 5;

Constitutuion of the Advisory Committee

3. 1) As soon as may be after the commencement of this Act, the Government shall, by notification,constitute a Committee for the State to be called "The Mizoram Oil Palm Advisory Committee"

2) The Committee shall consist of the following members, namely :-

a) the Minister in-charge of Agriculture who shall be the Chairman;

b) three members of the Legislative Assembly of the State to be nominated by the Government

c) Secretaries to the Government in-charge of Agriculture; Horticulture, Industries and Finance;

d) Heads of Departments of Agriculture, Horticulture and Industries;

e) Joint Director, ICAR Research Complex for NEH Region Mizoram Centre, Kolasib, Mizoram or his representative;

f) the Director, Regional Research Laboratory, Jorhat, Assam;

g) a representative of the Government of India, in the Ministry of Agriculture;

h) four representative of the oil palm processing Factories, as may be nominated by the Government;

i) Four persons from among the oil palm Growers as may be nominated by the Government;

f) the Oil palm Officer;

3) The Oil palm Officer shall be the Ex-Officio Member Secretary of the Committee;

4) The term of Office of the Committee shall be three years, but the Government may, for reasons to be recorded in writing, re-constitute the Committee at any time before the expiry of the term.

Function of the Advisory Committee

4. It shall be the duty of the Advisory Committee to advise the Government on the following matters namely :

a) extension of the areas under cultivation of oil palm;

b) problems relating to the cultivation of oil palm;

c) problems faced by the oil palm processing industry;

d) co-ordination between the oil palm growers and industry and sorting out of all matters which may arise;

e) to bring to the notice of the Government any measures that will suit the orderly development of the oil palm cultivation and industry;

f) such other matters as may be prescribed;

Constitution of Zonal Committee

5. 1) The Oil Palm Officer may, by notification declare each area specified therein attached to a processing factory as a Zone (herein after referred to as 'Factory Zone') constitute an Oil Palm Zonal Committee for each such Zone :

Provided that the Oil Palm Officer may, with the approval of the Government, constitute one Zonal Committee for more than one factory zone or more than one Zonal Committee for each factory Zone, if it is deemed necessary in the interests of effectively carrying out the purposes of this Act.

2) The Zonal Committee constituted under Sub-Section 1) shall consist of the following members, namely :

i) a Chairman nominated by the Oil Palm Officer with the approval of the Government from among the persons residing inthe factory zone;

ii) two persons representing the factory located in the factory zone to be nominated by the Managing Director of the factory concerned;

iii) four persons from among the growers to be nominated by the Oil Palm Officer;

iv) the District Agriculture Officer and Sub-Division Agril. Officer of the area, Divisional Agril. Engineer, Executive Engineer (Roads and Buildings) Executive Egineer (PHE) and Executive Engineer (P&E) representing the areas;

v) the Oil Palm Inspector conerned who shall be the Member Secretary of the Committee;

Provided that the Members specified in clause (iv) shall have the right to speak and otherwise to take part in the meetings of the Zonal Committee but shall not be entitled to vote at any such meeting.

3) The Committee constituted under this section shall be a body corporate having perpetual succession and common seal with power to acquire, hold and dispose of property and to enter into contracts and may by its corporate name sue and be sued,

4) The term of the Zonal Committee shall be three years and upon its expiry, the Committee shall be reconstituted in accordance with the provisions of sub-section (1) ;

Provided that if the Oil Palm Officer is satistied that it is necessary so to do, he may with the approval of the Goverment, by order dissolve the Committee before the expiry of its term :

Provided further that the Oil Palm Officer shall not pass any such order unless the Committee has had an opportunity of making its representations.

5) When a Committee dissolved, the following consequences shall follow :-

a) all the mebers shall vacate their offices on the date specified inthe order but without prejudice to their eligibility for renomination as members;

b) the Committee may be reconstituted within three months of its dissolution by the Oil Palm Officer in accordance with the Provisions of sub-section (1);

c) the powers and function of the Committee shall, pending its reconstitution be exercised and performed by the Secretary subject to such restrictions as may be specified in the order

6) The Oil Palm Officer may, with the approval of the Government, remove any member of the Committee, including the Chairman, from his office after recording the reasons in writing for such removal :

Provided that the order removing a member shall not be passed by the Oil Palm Officer unless such member has had an opportunity of making his representation.

Powers and functions of the Zonal Committee

6. 1) The functions of the Zonal Committee shall be to :-

a) consider the programme of development of Oil Palm Cultivation in the factory Zone;

b) deliberate on the problems faced by the factory or the growers in cultivation and transport of Oil Palm;

c) devise plans for removal of such problems with the funds as may be available with the Committee and to recommend to the Government such action as is necessary for solving the problems;

d) recommend to the local bodies; Public Works Department of the Government for proper improvement and upkeep of roads leading to the foctory Zone from the cultivating centres including feeder roads :

e) take steps for prevention and control of Oil Palm diseases and pests affecting Oil Palm and render all possible help for the development of Oil Palm Cultivation;

f) draw up, Plans for training of the cultivators and for extension work in respect of Oil Palm with the funds as may be available with the Committee;

g) consider complaints of the grower regarding transportation, purchase of Oil Palm FFB's and payment of price by the factory to the Oil Palm Cultivators;

h) administer the funds as may be available.

2) The Government or the Oil Palm Officer may call a joint meeting of the Chairman and Members of all the Zonal Committees for deliberating on the isues common to all the factory zones

Zonal Committee Funds

7. 1) There shall be a fund at the disposal of the Zonal Committee for the performance of the various functions entrusted to it.

2) The funds of the Committee shall consist of :-

a) grants made by the State Government either for a general purpose or for any specific purpose for the performance of the functions of the Committee.

b) such contributions as may be made by the factories, Oil Palm Grower', Oil Palm Growers' Cooperative Societies or such other organisations interested in the development of Oil Palm Cultivation and processing

Appointment of Oil Palm Commissioner

8. Subject to such rules as may be made in this behalf the Government shall appoint an Officer of the Government as Oil Palm Officer or may designate an Offier of the Government as Oil Palm Officer to exercise the powers and perform the functions of the Officer under this Act.

Oil Palm Inspector	9.	1)	Subjects to such rules as may be made in this behalf; the Government may appoint such number of officers of the Government as Oil Palm Inspetors for such areas as may be specified under this Act to exercise the powers and perform the functions vested in the Oil Palm Inspectors under this Act.
		2)	Not with standing anything contained in sub-section (1) the Government may designate any officer of the Department of Agriculture to excercise the powers and perform the functions of the Oil Palm Inspector under this At.
Register of Oil Palm Growers' and Oil Palm Growers; Cooperative	10.	1)	The occupier of the factory, in every factory zone shall maintain in such form and insuch manner as may be presribed a Register of Oil Palm Growers in the Zone attached to the factory in of accordance with the provisions of section 11. The Register shall be updated every year and shall always be available inthe officeof the factory for inspection by the Oil Palm Inspector or any other authority authorised bythe Government or Oil Palm Growers Gooperative Societies in the concerned zone as in the Register shall also be made available by the said occupier to the Zonal Committee. It shall be competent for the Oil Palm Officer, onthe report submitted by the inspecting authority, to order such corrections as he deems fit in the registers maintained under this section.
Declaration of factory Zone	11.	1)	The Government shall have the power to declare by notification, any area as factory zone for the purpose of supply of fresh oil palm fruit bunches to the factory specified for the purpose or purchase of Oil Palm FFB and any other Oil Palm product by the factory.
		2)	Where a particular area is declared as Factory Zone under sub-section (1) the Oil Palm growers in that area shall supply the fresh fruit bunches from the Oil Palm plantations grown in that area only to the factory to whom the factory zone is attached and to none else.
		3)	Where a particular factory zone is declared under this section the occupier of the factory in the concerned factory zone and for which the zone is declared, shall buy all the Oil Palm FFB produced by all the Oil Palm growers or their cooperative Societies inthat factory zone as are offered for sale by them at a price which shall not be less than the price fixed by the authority empowered to fix the price under this Act.

Failure to buy

12. 1) In the event of failure on the part of the occupier of a factory to buy all the fresh fruit bunches from the growers in the factory zone declared in relation to a factory, without any valid reason, the occupier of factory shall be liable to compensate the loss that may have been caused to the grower on account of non-purchase of the Oil Palm FFBs by the factory inaddition to the penalty specified in section 15.

2) Where an occupier of a factory refuses to buy particular consignment or consignment of Oil Palm FFBs from a growers, he shall assign reasons thereof in writing :

Provided that damage, inefficient running, breakdown of plant machinery, failure to use capacities and any other operational problems shall not be valid reasons for refusal of the consignment of Oil Palm FFBs and shall be treated as the failure on the part of the factory to buy the oil palm FFBs for pur poses of sub-section (1) :

Provided further that the Oil Palm Officer shall be the authority fo decide whether there are valid reasons for the failure to buy oil palm FFBs and his decision thereon shall be final.

Power to fix prices

13. 1) The Government may on their own fix the minimum price of oil palm FFBs or may authorise the Oil Palm Officer to do so, subject to such guidelines as they may give in that regard from time to time.

2) Where the Oil Palm Commissioner is authorised to fix the Prices of oil palm FFBs to be purchased by the factory, he shall declare at such intervals as may be directed by the Government the minimum price at which the oil palm FFBs be purchased by the factories.

Maintenance of Records and inspection

14. 1) Every occupier of the factory shall maintain such records as are prescribed or as required by the Oil Palm Officer with the approval of the Government.

2) An Oil Palm Inspector may at any time inspect a factory and verify such records, reports, statements and registers as may be required to be maintained in connection with due implementation of the provisions of this Act and may also direct the occupier of a factory to produce them for his verification

3) The powers under sub-section (2) may be exercised by any

Officer authorised in this behalf by the Oil Palm Officer by a general or specific order.

4) An occupier of the factory who fails to maintain the record as required by this section or fails or refuses to produce the same when called for by authority under this Act shall be punishable under section 15.

Penalties

15. (1) Every person or occupier of a factory who contravenes the provisions of section 11 shall be punishable with the fine which may extend to rupees ten thousand and in the case of a continuing contravention of the provisions of the said section with a further fine not exceeding rupees one thousand for each day during which the contravention continues.

(2) Any person or occupier of a factory contravening any of the provisions of this Act or of any rule or order made under this Act for which no penalty is provided in sub-section (1) shall be punishable with fine which may extend to rupess five thousand.

Institution of proceedings

16. (1) No court shall take cognizance of an Offence punishable under this Act, or any rule or order, made there under except upon a complaint in writing made by the Oil Palm Officer or any authority or Officer authorised by him in this behalf.

(2) No court inferior to the court of a Magistrate of the First Class shall take cognizance of, or try, an offence under those Act or any rule or order made thereunder.

Compounding of Offences

17. On the application of a person accused of an offence under this Act or any rule or order made thereunder the Oil Palm Officer or any authority or Officer authorised by him in this behalf may, at any stage, compound such offence by levying a compounding fee nor exceeding rupees ten thousand.

Protection of acts done in good faith

18. (1) No suit, prosecution or other legal proceeding shall lie against any person or anything which is in good faith done or intended to be done in pursuance of any provision of this Actor any rule or order made thereunder.

(2) No suit or other legal proceeding shall lie against the Government for any damage caused or likely to be caused by anything which is in good faith done or intended to be done in pursuance of any provision of this Act or of any rule or order made thereunder.

Ex - 362/2004

Determination of occupier of factory for the purposes of this Act.

19. (1) Where the occupier of an Oil Palm factory is a firm or other association of individuals any one or more of the partners or members thereof may prosecuted and punished under this Act for any offence for which the occupier of the factory or owner thereof is punishable.

Provided that the firm or asociation may give notice to the Oil Palm Officer that it has nominated one of its partners or members to be occupier of the factory for the purpose of this Act, and such individuals shall be deemed to be the occupier of factory for teh purpose of this Act, until further notice cancelling his nomination is received by the Oil Palm Officer or until he ceases to be a partner or member of the firm or association as the case may be.

(2) Where the occupier of a factory is a company or a Co-operative Society, any one or more of the Directors thereof, or, in the case of a private company, any one or more of the shareholders thereof, may be prosecuted and punished under this Act, for any offence for which the occupier of the factoryis punishable:

Provided that the company or co-operative society may give notice to the Oil Palm Officer that it has nominated a Director, and a private company may give notice to the said officer that it has nominated a shareholder, to be the occupier of the factory for the purpose of this Act, until further notice cancelling his nomination is received by the Oil Palm Officer or until he ceases to be a Director or shareholder, as the case may be.

Payment of Oil Palm Price

20. (1) The occupier or owner of an Oil Palm factory shall make suitable provision to the satisfaction of the Oil Palm Officer for the payment of the price of oil palm FFB supplied to the factory.

(2) Upon the delivery of oil palm FFB, the occupier or owner of a factory shall be liable to pay within fourteen days from the date of such delivery the price of the oil palm FFB so supplied.

(3) The price of the oil palm FFB remaining un-paid on the expiration of the period specified in sub-section (2) shall carry interest at fifteen per cent per annum from the date of dlivery of oil palm FFB and it shall be recovered as if it were an arrear of land revenue.

(4) If any occupier or owner of a oil palm factory fails to pay the price of the oil palm FFB sold to him in accordance with the provision of sub-section (2) or the interest payable under the sub-section (3), he shall, in addition to the said price or the interest being recovered from him as an arrear of land revenue, be

liable to the penalty provided for under clause (b) of sub-section (4) of section 3 of the Essential Commodities Act, 1955 (Central Act 10 of 1955) as if he has contravened a direction issued under that clause.

(5) Without prejudice to the provisions of the foregoing sub-sections, where the owner or occupier of a factory or any other person competent in that behalf, enters into an agreement with a bank under which the bank agrees to give advance to him on the security of palm oil produced or to be produced in the factory the said occupier, owner or other person, as the case may be shall provide in such agreement that such percentage, which shall not be less than fifty percent of the total amount of advance as may be prescribed, shall be set apart and be availabe only for payment to oil palm growers or other co-operatives societies on account of the quantity of oil palm FFB purchased or to be purchased for the factory from those oil palm growers or from or through those societies and interest thereon and such societies commission in respect thereof.

(6) Every such occupier, owner or other person as aforesaid shall send a copy of every such agreement to the Oil Palm Officer within week from the date on which it is entered into.

Levy on Tax on purchase on purchase of oil palm on FFBS

21 (1) Government may, by notification, levy a tax with a rate not exceeding Rs. one hundred per M.T on the purchase of FFBs required for use, consumption or sale in factory.

(2) The Government may, by notification, remit in whole or in part such tax in respect of FFBs used or intended to be used in a factory for any purpose specified in such notification.

(3) The tax payable under sub-section (1) shall be levied and collected from the occupier of the factory or from the person receiving oil palm FFBs or the oil palm Processing Factory in such manner and by such authority as may be prescribed.

Purposes for which tax levied and collected

22. The tax on Oil Palm levied and collected under the section 21 shall be used for the following purposes namely -

(i) for the overall development of oil palm plantations;

(ii) to bring more areas under oil palm cultivation;

(iii) to monitor the schemes benefitting oil palm growers;

(iv) to develop the feeder roads to facilitate movement of oil palm FFBs; and

(v) any other purporse in the interests of Oil Palm Growers in particular or in the interests of general public residing in Oil Palm Growing Zones.

Power of Government to give direction

23. The Government may, subject to other provisions of this Act, by order, direct the Oil Palm Officer of any other Officer to make an enquiry or to take appropriate proceeding under this Act, in respect of any matter specified in this order, and the Oil Palm Officer or the other officer, as the case may be shall report to the

Government in due course, the result of the enquiry made or the proceeding taken by him.

Delegation of powers of Government

24. The Government may, by notification, delegate all or any of their powers under this Act, except section 25 to any person or authority subordinate to them subject to such conditions and to such control and revision as may be specified in the notification; and they may in the like manner withdraw any powers so delegated.

Power to make Rules.

25. (1) The Government may, by notification make rules for carrying out all or any of the purposes of this Act.

(2) In particular and without prejudice to the generality of the foregoing power the Government may make rules :-

(a) as to the conditions governing the declaration of a factory zone and as to the alteration or cancellation thereof;

(b) as to the plucking, collection and delivery of the oil palm FFBs by the growers or as the case may be by the companies and the prescription of collection centres by the Oil Palm Officer.

(3) Every rule made by the State Government under this Act shall be laid, as soon as may be after it is made, before the Mizoram Legislative Assembly.

Power to remove difficulties

26. If any difficulty arises in giving effect to the provisions of remove this Act, the State Government may, by order not in inconsistent with the provisions of this Act, remove such difficulty.

P.Chakraborty,
Secretary to the Govt. of Mizoram,
Law, Judl. & Par. Affairs
Aizawl.

Printed at the T.M.Offset Printing Press, Canteen Square, Dawrpui, Aizawl. C- 2000

ANNEXURE – III

The Mizoram Oil Palm Advisory Committee

In supersession of the earlier notification N. B 13019/2/2013-AGR/Pt dated 19th April, 2017, the Government of Mizoram reconstituted the Mizoram Oil Palm Advisory Committee vide letter No. B 13019/2/2013-AGR dated 20th March, 2019 with the following members for a term of 3 years:

1.	Minister, Agriculture Department	Chairman
2.	Pu C. Lalsawivunga, MLA	Member
3.	Pu Lalrinsanga, MLA	Member
4.	Pu H. Lalzirliana, MLA	Member
5.	Commissioner & Secretary, Agriculture Department	Member
6.	Commissioner & Secretary, Commerce & Industries	Member
7.	Secretary, Horticulture Department	Member
8.	Secretary, Finance Department	Member
9.	Director of Agriculture (Crop Husbandry)	Member Secretary
10.	Director of Agriculture (Research & Extension)	Member
11.	Director, Horticulture Department	Member
12.	Director, Commerce & Industries Department	Member
13.	Director, Regional Research laboratory, Jorhat, Assam	Member
14.	Chief Engineer, Minor Irrigation Department	Member
15.	Joint Director, ICAR, Kolasib, Mizoram	Member
16.	Representative of Govt. of India, Ministry of Agriculture	Member
17.	Senior Development Officer, Godrej Agrovet Ltd.	Member
18.	Manager, 3F Oil Palm Agrotech Pvt. Ltd.	Member
19.	Jt. Officer, Ruchi Soya Industries Ltd.	Member
20.	President, All Mizoram Farmers' Union, Mizoram	Member
21.	Pu R. Saikhuma, Oil Palm Grower, Project Veng, Kolasib	Member
22.	Pu V. Lallawmzuala, Oil Palm Grower, Venchung, Serchhip	Member
23.	Pu C. Lalthanzuala, Oil Palm Grower, Bazar Veng, Mamit	Member
24.	Pu V. kapchungnunga, Oil Palm Grower, Electric Veng, Lunglei	Member
25.	Pu Vanremsanga, Oil Palm Grower, Chhingaveng, Aizawl	Member
26.	Pu M.C. Lalrokuma, Oil Palm Grower, Bazar Veng, Lawngtlai	Member
27.	Pu F. Lalbiakhluna, Oil Palm Grower, Maubawk Zero, Siaha	Member

ANNEXURE – IV

Project Management Committee

Government of Mizoram notified the Project Management Committee (PCM) on Oil Palm vide letter No. B 13019/1/2013-AGR dated 19th February, 2014 superseding the earlier notification dated 19th November, 2007 with the following members:

1.	Principal Secretary/ Commissioner/Secretary, Agri. Dept.	Chairman
2.	Commissioner/Secretary, Finance Department	Member
3.	Commissioner/Secretary, Industries Department	Member
4.	Commissioner/Secretary, PWD	Member
5.	Commissioner/Secretary, E& F Department	Member
6.	Director of Agriculture (Crop Husbandry)	Member Secretary
7.	Director of Agriculture (Research & Extension)	Member
8.	Director of Horticulture, Mizoram	Member
9.	Director, Rural Development Department, Mizoram	Member
10.	Chief Engineer, Minor Irrigation, Mizoram	Member
11.	Joint Director of Agriculture, Mizoram	Member
12.	Deputy Director (Oil Palm), Directorate of Agriculture (CH)	Member
13.	Representative from Godrej Agrovet Ltd.	Member
14.	Representative from 3F Oil Palm Agrotech Pvt. Ltd.	Member
15.	Representative from Ruchi Soya Industries Ltd.	Member
16.	District Agriculture Officer, Aizawl/Kolasib/Mamit/Serchhip/Lunglei/Lawngtlai/Saiha	Member
17.	Chairman, Oil Palm Zonal Committee Aizawl/Kolasib/Mamit/Serchhip/Lunglei/Lawngtlai/Saiha	Member

ANNEXURE – V

Price Fixation Committee

Consequent upon the amalgamation of Directorate of Agriculture (CH) and Directorate of Agriculture (R&E), the Government of Mizoram reconstituted Price Fixation Committee of oil palm FFBs (Fresh Fruit Bunch) vide notification No.B.13019/1/2017-AGR dated the 6th September, 2022, in supersession of the Department's notification No.B.13019/1/2013-AGR dt. 06.03.2013 with the following members:

1.	Secretary, Agriculture Department, Govt. of Mizoram	Chairman
2.	Joint Secretary, Agriculture Department, Govt. of Mizoram	Member
3.	Jt. Secretary (Estab.) Finance Department, Govt. of Mizoram	Member
4.	Director of Agriculture, Mizoram Secretary	Member
5.	Joint Director, Agriculture Department, Mizoram	Member
6.	Deputy Director (Planning & Monitoring), Agri. Department	Member
7.	District Agriculture Officer & Member Secretary District Oil Palm Zonal Committee, Aizawl/Lunglei/Siaha/Kolasib/Serchhip/Lawngtlai/Mamit	Member
8.	Deputy Director (Oil Palm), Directorate of Agriculture, Mizoram	Member
9.	Chairman, District Oil Palm Zonal Committee, Aizawl/Lunglei/Siaha/Kolasib/Serchhip/Lawngtlai/Mamit	Member
10.	Representative of Godrej Agrovet Pvt. Ltd.	Member
11.	Representative of Patanjali Foods Ltd.(Ruchi Soya Industries Ltd)	Member

ANNEXURE – VI

GOVERNMENT OF MIZORAM
AGRICULTURE DEPARTMENT
*****

NOTIFICATION

Dated Aizawl, the 21st October, 2020.

No. B. 13019/2/2013-AGR : As envisaged under the provision of section 5(1) & (2) of the Oil Palm (Regulation of Production & Processing) Act, 2004, the Governor of Mizoram is pleased to re-constitute the Mizoram Oil Palm Zonal Committee for various Districts consisting of the following members:

I. AIZAWL DISTRICT

1. Pu H. Neihchhunga, Dawrpui Vengthar, Aizawl	-	Chairman
2. District Agriculture Officer, Aizawl	-	Member Secretary
3. Pu H. Lalhmachhuana, Sairang (Oil Palm Grower)	-	Member
4. Pu Zakamlova, Phulpui (Oil Palm Grower)	-	Member
5. Pu Vanremsanga, Chhinga Veng (Oil Palm Grower)	-	Member
6. Pu H. Rongura, Maubawk (Oil Palm Grower)	-	Member
7. Representative of Godrej Agrovet Limited	-	Member
8. Sub-Divisional Agriculture Officer, Aizawl	-	Member
9. Executive Engineer, PWD, Highway Division-III	-	Member
10. Executive Engineer, PHE, Rural Division, Laipuitlang	-	Member
11. Executive Engineer, P&E, Distribution Division	-	Member
12. Executive Engineer, Minor Irrigation, Aizawl Division	-	Member

II. LUNGLEI DISTRICT

1. Pu V. Kapchungnunga, Electric Vedng, Lunglei	-	Chairman
2. District Agriculture Officer, Lunglei	-	Member Secretary
3. Pu H. Rotluanga, Lungsen (Oil Palm Grower)	-	Member
4. Pu R. Manchianga, Tawipui 'S' (Oil Palm Grower)	-	Member
5. Pu Ngurhnawla, Zawlpui (Oil Palm Grower)	-	Member
6. Pu Johomoni, Putluangasih (Oil Palm Grower)	-	Member
7. Representative of Ruchi Soya Industries Limited	-	Member
8. Sub-Divisional Agriculture Officer, Tlabung	-	Member
9. Executive Engineer, PWD(Road), Tlabung	-	Member
10. Executive Engineer, PHE, Lunglei Division	-	Member
11. Executive Engineer, P&E, Lunglei Division	-	Member
12. Executive Engineer, Minor Irrigation, Lunglei	-	Member

Cont/.....

III. KOLASIB DISTRICT

1. Pu R. Saikhuma, Project Veng, Kolasib	-	Chairman
2. District Agriculture Officer, Kolasib	-	Member Secretary
3. Pu R. Lalzawmliana, Kawnpui (Oil Palm grower)	-	Member
4. Pu F.Lalnunthara, Phaisen (Oil Palm grower)	-	Member
5. Pu H. Lalrintluanga, Venglai, Kolasib (Oil Plam grower)	-	Member
6. Pu R. Laibata. Collage Veng, Kolasib (Oil Palm grower)	-	Member
7. Pu R. Lalthanmawia, Buhchangphai (Oil Palm Grower)	-	Member
8. Pu Lalramliana, Bilkhawthlir (Oil Palm Grower)	-	Member
9. Pi Lalnunziri, Collage Veng, Kolasib (Oil Palm Grower)	-	Member
10. Representative of Godrej Agrovet Limited	-	Member
11. Sub-Divisional Agriculture Officer, Kolasib	-	Member
12. Sub-Divisional Agriculture Officer, Bilkhawthlir	-	Member
13. Subject Matter Specialist(Agro), Kolasib	-	Member
14. Executive Engineer, Minor Irrigation, Kolasib	-	Member
15. Executive Engineer, PWD, Kolasib	-	Member
16. Executive Engineer, PHE, Kolasib Division	-	Member
17. Executive Engineer, P&E, Kolasib Division	-	Member

IV. LAWNGTLAI DISTRICT

1. Pu Vanthanga, M. Kawnpui	-	Chairman
2. District Agriculture Officer, Lawngtlai	-	Member Secretary
3. Pu N.Sangkhara, Bungtlang 'S', Lawngtlai	-	Member
4. Pu Adi Kumar, Nghalim Lui (Oil Palm Grower)	-	Member
5. Pu Malsawma, Chamdur 'P' (Oil Palm Grower)	-	Member
6. Pu Rohlua, M. Kawnpui (Oil Palm Grower)	-	Member
7. Pu Ratna Kumar, Tuikhurlui (Oil Palm Grower)	-	Member
8. Representative of Ruchi Soya Industries Limited	-	Member
9. Sub-Divisional Agriculture Officer, Chawngte	-	Member
10. Divisional Horticulture Officer, Lawngtlai	-	Member
11. Executive Engineer, PWD (Road & Building), Lawngtlai	-	Member
12. Executive Engineer, PHE, Lawngtlai	-	Member
13. Executive Engineer, P&E, Lawngtlai	-	Member
14. Executive Engineer, Minor Irrigation, Lawngtlai	-	Member

V. MAMIT DISTRICT

1. Pu Lalrindika Sailo, Hmunsam Veng, Mamit	-	Chairman
2. District Agriculture Officer, Mamit	-	Member Secretary
3. Pu Vanlalthawma Pachuau, Mamit (Oil Palm Grower)	-	Member
4. Pu Remruatfela, Nalzawl (Oil Palm Grower)	-	Member
5. Pu H. Lalsangvunga, Hmunpui (Oil Palm grower)	-	Member
6. Pu R.L. Thangseia, W. Phaileng (Oil Palm grower)	-	Member
7. Representative of Godrej Agrovet Limited	-	Member
8. Sub-Divisional Agriculture Officer, Mamit	-	Member
9. Sub-Divisional Agriculture Officer, Zawlnuam	-	Member
10. Sub-Divisional Agriculture Officer, Kawrtethawveng	-	Member
11. Executive Engineer, PWD, Mamit Division	-	Member
12. Executive Engineer, PHE, Mamit Division	-	Member
13. Executive Engineer, P&E, Mamit Division	-	Member

VI. SERCHHIP DISTRICT

1. Pu Lalchhuanawma Siakeng, Chhimveng, Serchhip	-	Chairman
2. District Agriculture Officer, Serchhip	-	Member Secretary
3. Pu Laltlana, Keitum (Oil Palm Grower)	-	Member
4. Lallawmzuala, Serchhip Vengchung (Oil Palm Grower)	-	Member
5. Pu Lalzoliana, Thenzawl (Oil Palm Grower)	-	Member
6. Pu Lallunghnema, Chhiahtlang (Oil Palm grower)	-	Member
7. President, Village Level Oil Palm Grower Asstn, Bungtlang	-	Member
8. President, Village Level Oil Palm Grower Asstn, Keitum	-	Member
9. President, Village Level Oil Palm Grower Asstn, Khawlailung	-	Member
10. President, Village Level Oil Palm Grower Asstn, Chhiahtlang	-	Member
11. President, Village Level Oil Palm Grower Asstn, Thenzawl	-	Member
12. President, Village Level Oil Palm Grower Asstn, Chhingchhip	-	Member
13. President, Village Level Oil Palm Grower Asstn, Khumtung	-	Member
14. President, Village Level Oil Palm Grower Asstn, Serchhip-I&II	-	Member
15. President, Village Level Oil Palm Grower Asstn, Serchhip-III	-	Member
16. President, Village Level Oil Palm Grower Asstn, Serchhip-IV	-	Member
17. President, Village Level Oil Palm Grower Asstn, New Serchhip	-	Member
18. Sub-Divisional Agriculture Officer, Serchhip	-	Member
19. Executive Engineer, PWD, Serchhip Division	-	Member
20. Executive Engineer, PHE, Serchhip Division	-	Member
21. Executive Engineer, P&E, Serchhip Division	-	Member
22. SDO, Minor Irrigation, Serchhip	-	Member

VII. **SIAHA DISTRICT**

1. Pu K. Malsawma, Council Veng, Siaha	-	Chairman
2. District Agriculture Officer, Siaha	-	Member Secretary
3. Pu Patha Hlychho, Maubawk (Oil Palm Grower)	-	Member
4. Pu HC. Paly, Kaolchao 'E' (Oil Palm Grower)	-	Member
5. Pu S. Liana, Amobyu Vaihthie (Oil Palm Grower)	-	Member
6. Pu Lalthara, Amobyu Vaihthie (Oil Palm Grower)	-	Member
7. Pu F. Lalbiakhluna, Amobyu Vaihthie (Oil Palm Grower)	-	Member
8. Pu B. Zahnei, Amobyu Vaihthie (Oil Palm Grower)	-	Member
9. Pu C. Lalhmangaiha, Amobyu Vaihthie (Oil Palm Grower)	-	Member
10. Agriculture Extension Officer (Hqrs), DAO, Siaha	-	Member
11. District Horticulture Officer, Siaha	-	Member
12. Executive Engineer, PWD(Road & Building), Siaha	-	Member
13. Executive Engineer, PHE, Siaha	-	Member
14. Executive Engineer, P&E, Siaha	-	Member
15. Sub-Divisional Officer, Minor Irrigation, Siaha	-	Member
16. Senior Scientist & Head, KVK, Siaha	-	Member

The term of the Zonal Committee shall be 3(three) years with effect from the date of issue of this Notification and on its expiry, the Committee shall be reconstituted.

This supersedes the Department's Notification of even No. dt.23.02.2015 and 20.07.2017.

Sd/- LALHMINGTHANGA
Commissioner & Secretary to the Govt. of Mizoram
21/10/2020 Agriculture Department

Memo No.B.13019/2/2013-AGR Dated Aizawl, the 21st October, 2020.

Copy to :

1. *Secretary to Governor, Mizoram.*
2. *P.S. to Chief Minister, Mizoram.*
3. *P.S to Minister, Agriculture Department, Mizoram.*
4. *Sr. P.P.S. to Chief Secretary, Govt. of Mizoram.*
5. *Director of Agriculture (Crop Husbandry) with a request to circulate to all members.*
6. *Director of Agriculture (Research & Extension), Mizoram.*
7. *Principal, SAS, Hnahthial.*
8. *All District Agriculture Officers.*
9. *All members concerned.*
10. *Website Manager, DP&AR for uploading on the website.*
11. *Guard File No.16.*

(LALHMINGMAKA)
Under Secretary to the Govt. of Mizoram
21/10/2020 Agriculture Department

ANNEXURE – VII

Annual Fresh Fruit Bunch Productivity (per hectare)

Kum tluana Oil Palm rah thar chhuah theih zat (hectare 1 zelah)

A upat dan (Age)	A rah thar theih zat (MT FFB/ha)	A rah bawr chhuah theih zat	A rah bawr rih lam (kg)
Kum 3na	1.5 MT/Year	500	3
Kum 4na	5 MT/Year	1220	4.1
Kum 5na	8 MT/Year	1212	6.6
Kum 6na	11 MT/Year	1209	9.1
Kum 7na	15 MT/Year	1293	11.6
Kum 8na	18 MT/Year	1304	13.8
Kum 9na	18 MT/Year	1065	16.9
Kum l0na	18 MT/Year	989	18.2
Kum 11na	18 MT/Year	933	19.3
Kum 12na	18 MT/Year	882	20.4
Kum 13na	18 MT/Year	849	21.2
Kum 14na	18 MT/Year	818	22
Kum 15na	18 MT/Year	804	22.3
Kum 16na	18 MT/Year	789	22.8
Kum 17na	18 MT/Year	779	23.1
Kum 18na	16.5 MT/Year	708	23.3
Kum 19na	15.0 MT/Year	638	23.5

Source: Mizoram Agriculture (oil Palm Chin Dan) (loneitu.nic.in)
Department of Agriculture, Government of Mizoram.

ANNEXURE – VIII

A. Palm Oil Mill and related pictures

Image 1: Godrej Agrovet Limited Palm Oil Mill, Bukvannei, Kolasib District, Mizoram

Image 2: Oil Palm Fresh Fruit Bunches (FFBs) purchased by the Palm Oil Mill

Image 3: Oil Palm FFBs placed on the roadside, waiting for collection by the Company

APPENDIX – VIII

B. Stages of Oil Palm Plants

Image 4: Oil Palm Seed Sprout

Image 5: Oil palm seedlings at Oil Palm Nursery, Saihapui.

Image 6: Oil Palm Trees

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BRIEF BIO DATA OF THE CANDIDATE

Name : Khawlsiamthanga Khawlhring

Father's Name : Thanghuta (L)

Spouse's Name : Rondy Lalrinpuii

Edu. Qualification : M.A (Economics); M.Phil (Economics); Ph.D (Management)

Date of Birth : 17th January, 1974

Present Address : Durtlang Leitan, Aizawl, Mizoram.

Contact Address : Phone No. 9862840722; e-mail: kholaetc@gmail.com

MZU Registration No.: 1506367

Ph.D Registration No.: MZU/Ph.D/1136 of 02.05.2018

PARTICULARS OF THE CANDIDATE

Name : **Khawlsiamthanga Khawlhring**

Degree : **Ph.D**

Department : **Management**

Title of the thesis : **A Study on the Status and Performance of Contract Farming in Mizoram with Special Reference to Oil Palm**

Date of Admission : **31.08. 2017**

Approval of Research Proposal:

1. **DRC** : **13th April, 2018**
2. **BOS** : **24th April, 2018**
3. **SCHOOL BOARD** : **2nd May, 2018**

MZU REGISTRATION NO. : **1506367**

PH.D REGISTRATION NO. & DATE : **MZU/Ph.D/1136 of 02.05.2018**

EXTENSION (IF ANY) : **NA**

Dated Aizawl
The 28th February, 2023

PROF. L. S. SHARMA
Head of Department

ABSTRACT

A STUDY ON THE STATUS AND PERFORMANCE OF CONTRACT FARMING IN MIZORAM WITH SPECIAL REFERENCE TO OIL PALM

AN ABSTRACT SUBMITTED
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
THE DEGREE OF DOCTOR OF PHILOSOPHY

KHAWLSIAMTHANGA KHAWLHRING
MZU REGISTRATION NO: 1506367
Ph. D. REGISTRATION NO: MZU/Ph.D/1136 of 02.05.2018

DEPARTMENT OF MANAGEMENT
SCHOOL OF ECONOMICS, MANAGEMENT
AND INFORMATION SCIENCE
FEBRUARY, 2023

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BY

KHAWLSIAMTHANGA KHAWLHRING

DEPARTMENT OF MANAGEMENT

SUPERVISOR

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1. BACKGROUND

Contract farming is a system of farming, in which agro-processing or trading units enter into a contract with farmers to purchase a specified quantity of any agricultural commodity at a pre-agreed price. Singh (2002) claims that contract farming consists of four elements: a pre-determined price, quality standards, amount or acreage, and time. Contracts outline the costs and quantities of the commodity produced before harvest, as well as other production-related information. Will (2013) defines "contract farming" as an upfront agreement that outline the responsibilities of farmers and buyers as business partners. The Japanese government first implemented contract farming in Taiwan in 1895 (KhetiGaadi, 2022). Contracts can be advantageous because they lower the risks associated with marketing and procurement for both the corporation and the farmer (Eaton & Shepherd, 2001). Contract farming may involve market provision, resource provision, and management specification. It has the potential to solve a number of conventional problems, including fragmented holdings, a long chain of market middlemen, producers' ignorance of buyers' needs, low farm mechanisation, inadequate finance and farmer distress sales (Ministry of Agriculture & Farmers' Welfare, 2017).

1.2 Contract Farming in India

Contract farming has existed in India since the time of the East India Company, when opium and indigo cultivation were first introduced by Europeans to the Bengal region. Contract farming in India witnesses Indian Tobacco Company's (ITC) agreements with farmers in Andhra Pradesh for the production of Virginia tobacco in the 1920s, PepsiCo's contract farming for the production of vegetables, particularly tomatoes and potatoes in Hosiarpur Taluk of Rajasthan in 1927, the emergence of seed companies in the 1960s, the green revolution in the 1970s, and tomato farming agreements in Punjab in the 1990s by PepsiCo. The Model Agricultural Produce Marketing (Regulation) Act,

which the central government circulated to the states in 2003 for the purpose of implementing marketing reforms, contains provisions for the registration of contract farming sponsors, the recording of contract farming agreements with the Agricultural Produce Marketing Committee (APMC) or another authority specified by the Act, the protection of farmers' title or rights to their land under such contracts, a mechanism for resolving disputes and more. A set of Model APMC Regulations have also been circulated by the Ministry of Agriculture to help states in formulation of rules and for adoption in this regard. In order to create a legal basis for contracts, various state governments have recently added relevant portions to their individual APMC Acts. With few exceptions like Punjab where the state is actively involved in parts of the contracts, contract farming by corporate sector has so far primarily included buyback and input supply (Ray et al., 2020).

1.3 India's Edible Oil Requirement

According to the reports of the Ministry of Agriculture (2021), during the period from 2010-11 to 2020-21, domestic production of edible oil was 1084.41 lakh tonnes while 1326.82 lakh tonnes was imported, which means only around 45% of the edible oil requirement in India had been met from the domestic production and another 55% had been met from imports during the last decade. According to Jadhav (2022), the Ministry of Consumer Affairs admits that domestic production of edible oils is unable to meet domestic demand. While just 111.6 lakh tonnes of edible oils are produced domestically, the country consumes about 250 lakh tonnes annually.

1.3.1 Oil Palm Cultivation to meet Domestic Edible Oil Requirement

Oil palm was first introduced in the country as an ornamental plants in the National Botanical Gardens, Kolkatta in 1886. Realising the potential of oil palm for self-sufficiency in edible oil, the Central government started various oil palm development programme, viz., Technology Mission on Oilseeds (TMO) launched in 1986-1987; Oil Palm Development Programme (OPDP) in 1991-1992; Integrated Scheme of Oilseeds, Pulses, Oil Palm & Maize (ISOPOM) in 2004-2005; Oil Palm Area Expansion Programme (OPAE) in 2011-12; National Mission on Oilseeds and Oil Palm (NMOOP)

in 2014–15; National Food Security Mission – Oil Palm (NFSM-OP) in 2018-19 and National Mission on Edible Oils-Oil Palm (NMEO-OP) in 2021-22.

The state-wise potential area for oil palm cultivation in India was assessed by ICAR-IIOPR in 2020 and identified 27,99,086 ha in 22 states, viz. Andhra Pradesh, Arunachal Pradesh, Assam, Andaman & Nicobar, Bihar, Chhattisgarh Gujarat, Goa Karnataka, Kerala, Odisha, Tamil Nadu, Telangana, Uttar Pradesh, Madhya Pradesh, Maharastra, Manipur, Meghalaya, Mizoram, Nagaland, , Tripura and West Bengal.

1.4 Oil Palm Contract Farming in Mizoram

The potential area was re-assessed in the year 2020 by ICAR-IIOPR and 66,791 ha was considered potential area for oil palm cultivation (DoA-GoM, n.d.). The Oil Palm Act provides for a contract farming system in which the contracting firm will be responsible for seed supply and purchase of the fresh fruit bunches and the state government signed MoU with the three companies Godrej Agrovet Pvt. Ltd., Ruchi Soya Industries Ltd. (presently Patanjali Foods Ltd.) and 3F Oil Palm Agrotech Pvt. Ltd. (withdrawn from the MoU).

Mizoram is having a potential area of 66,791 ha in seven districts, out of which 26,680 ha have been cultivated by 10,843 farmers spreading across 197 villages of the seven districts. The total fresh fruit bunches sold till July, 2021 was 37,272.822 mt.

1.5 District-Wise Potential and Cultivated Areas

In terms of area coverage in ha, Siaha district is having the minimum area (86 ha or 4.3%) followed by Aizawl district (859 out of 11,150 ha or 7.7%) and Serchhip district (2,130 out of 9,000 ha or 23.7%). Kolasib district is having the largest cultivated area (6965 or 49.3%) followed by Lunglei district (6396 ha or 64%), Mamit district (5780 ha or 42.8%) and Lawngtlai (4464 ha or 63.8%). The area coverage under the three contracting firms are Godrej Agrovet Ltd. (46.11%) and Ruchi Soya/Patanjali Foods Ltd. (63.88%) and 3F Oil Palm (13.88%).

1.6 Significance of the Study

Formal contract farming system has been introduced in Mizoram with the implementation of the Mizoram Oil Palm (Regulation of Production & Processing) Act,

2004, wherewith, the government signed memorandum of understanding (MoU) with three companies in the years 2005 and 2006. Oil palm cultivation was taken up in the state involving the government, the companies and the farmers on Public Private Partnership (PPP) mode. Considering the production and the productivity of oil palm farmers in Mizoram, it is clear that the performance needs to be improved to fulfil the vision of the Government of India to attain self-sufficiency (*aatmanirbharata*) in edible oils. In addition, there is a paucity of literature in this area pertaining to Mizoram, so it is necessary to present trustworthy research-based information in order to give suggestions for improvement of the programme and to attain economies of scale. In light of this context, the study makes an effort to evaluate the status and operations of the state's current contract farming system. This study will offer policy inputs for contract farming, not only of oil palm but also other crops.

1.7 Area of the Study

The present study pertains to the oil palm contract farming in the state of Mizoram. There were three oil palm companies which have signed MoU with the state government. Oil palm was cultivated in seven districts out of the erstwhile eight districts, viz. Aizawl, Lunglei, Kolasib, Lawngtlai, Mamit, Serchhip and Siaha. The study covers four districts, viz. Kolasib & Mamit (Godrej Agrovet Ltd.), Lunglei (Ruchi Soya Industries Ltd./Patanjali Foods Ltd.) and Serchhip (3F Oil Palm Agrotech Pvt. Ltd.).

The present study covers four districts, having total potential area of 46,641 ha which is around 70% of the total potential area (66,791 ha) of the state. In terms of number of farmers, the study area is having 77.38% of the total oil palm farmers and the area cultivated is 81.41% of the total cultivated area of the state; 93.8% of the total FFB sold till July, 2021; 68.53% of the villages covered under oil palm cultivation. Therefore, the four districts, viz. Kolasib, Mamit, Serchhip and Lunglei are considered to be appropriately representing the case of Mizoram with the involvement of all the three companies dealing with the promotion of oil palm cultivation in the state.

1.8 Objectives of the Study

The primary objective of the study is to determine the present status and performance of contract farming in Mizoram. The specific objectives are:

i. To examine the socio-economic profile of oil palm contract growers.
ii. To identify the inputs (material and technical) provided to the farmers.
iii. To analyse the performance of the contract farmers to comply with contract requirements.
iv. To assess the performance of contracting firms in the delivery of materials and services.
v. To evaluate the operational and institutional constraints for the success of contract farming.

1.9 Research Hypotheses

The following hypotheses are proposed to be tested:

1. Socio-economic conditions of the oil palm contract farmers do not have significant impact on the quantity of the fresh fruit bunch (FFB) production.
2. Trainings provided to the farmers does not have significant impact on the production of FFB.
3. Trainings provided to the farmers does not have significant impact on the productivity of FFB
4. There is no significant difference on production of FFB among the contract farmers under the selected 3 companies.
5. There is no significant difference on productivity of FFB among the contract farmers under the selected 3 companies.
6. Contract farming does not result in significant improvement in the productivity of the contract farmers.
7. There is no significant effect of the farm's accessibility to the FFB production of the contract farmers.

1.10 Research Methodology

The study is exploratory as well as quantitative in nature.

1.10.1 Sources of Data

Primary data as well as the secondary data were used to study the performance of oil palm contract growers and the parties involved. Primary data were collected by conducting sample surveys using structured interview schedule, focussed group discussion, etc. during 2019. Secondary data were collected from sources like official publications, Directorate of Economics & Statistics, Agriculture Department, Oil Palm Mill (Godrej Agrovet Ltd.), etc. Secondary sources like journals, articles, academic literatures, published and unpublished research works in the field were also consulted.

1.10.2 Sample Size & Selection

According to the record of the Agriculture Department, oil palm is being cultivated in 197 villages of 7 (seven) districts and the total number of oil palm farmers in the state is 10,843. However, among the 3 (three) contracting firms, only Godrej Agrovet Ltd. (Kolasib & Mamit) have established a palm oil mill at Bukvannei, Kolasib District, whereas, 3F Oil Palm Agrotech Pvt. Ltd. (Aizawl, Serchhip & Saiha) and Patanjali Foods Ltd. (Lunglei & Lawngtlai) have not yet established a palm oil mill.

Taking 95 percent confidence level out of the total population of 10843 requires a minimum sample size of 372. Multi-stage sampling method was adopted to arrive at the desired number of samples. In the 1st stage, 2 (two) districts each were selected on the basis of: i) districts under firms who have established palm oil mills and ii) districts under firms who have not yet established palm oil mills. One district each with maximum number of village coverage under the two firms viz. 3F Oil Palm Agrotech Pvt. Ltd. and Patanjali Foods Ltd. were again selected. Hence, total number of districts covered was 4 (four). In the 2nd stage, the number of villages from each district were determined by proportionate sampling method, while taking the sample farmers per village as 20 (twenty). In order to cover 380 (three hundred eighty) farmers, we need 19 villages. Number of villages in each selected district divided by total number of villages in the four

districts (*135*) and multiplied by total sample villages (*19*); and by rounding of the number, arriving at the proportionate number of villages per district.

1.10.3 Evaluation of Status of Contract Farming:

Relevant data pertaining to contract farming in the state was collected from the department of Agriculture, company representatives of Godrej Agrovet Ltd, and Ruchi Soya Industries Ltd. (Patanjali Foods) through interview schedules as well as verbal communication. Data from the farmers were collected using interview schedules on various parameters.

1.10.4 Data Analyses:

The data collected were analysed using simple statistical measures like percentage, mean, standard deviation, t-test, ANOVA and regression analysis.

1.11 Chapterisation

Chapter 1: Introduction

Chapter 2: Review of Literature

Chapter 3: Overview of Contract Farming in India

Chapter 4: Institutional Settings of Contract Farming in Mizoram

Chapter 5: Analysis of Oil Palm Production and Supply Chain Status

Chapter 6: Findings, Conclusion and Suggestions

2. REVIEW OF LITERATURE

Contract farming could be formal or informal agreement signed between the farmer/producer and the buyer/processor. Eaton and Shepherd (2001) identified five types of contract farming models, such as, Centralized model, where the contracting company gives support to smallholders in production, purchases the produce and process it. it demands quality of the produce; Nucleus Estate Model, where the company manages a plantation to supplement the production of the small holders and minimal amount for the processing plant; Multipartite model involving partnership between government bodies, private entrepreneurs and farmers; Intermediary model involves subcontracting by processors to middlemen, who can have formal or less-formal arrangement with the

farmers or traders and Informal model entail small and medium enterprises making simple periodic contracts with producers.

Mighell and Jones (1963) devised a traditional typology of agricultural contracts, dividing them into three categories depending upon their primary goals, the delegation of decision-making authority and the transfer of risks, viz., *Market-specification (or marketing) contract*; *Production-management contract* and *Resource-providing contract*.

Contract farming, on the one hand, is attractive to contractors for guaranteeing consistent and of high-quality produce. On the other hand, many smallholder farmers have begun to find the usage of agricultural contracts to be interesting because the arrangement can ensure a steady income and access to dependable markets in the contemporary food supply chain. However, there are number of possible risks associated with implementation of contracting programmes that could result in failure to uphold the agreement on the part of both parties, whether they be farmers or contractors (Prowse, 2012).

Summary of Literature Reviews

Contract farming practices in different sectors and oil palm contract farming in various countries have been reviewed in this section and found mixed results. Some of the important findings are highlighted in this section.

1. Contract farming is found to result in food security, higher income and profitability to the farmers and it can also lead to improvement in farm production quality and cost effectiveness (Bolwig, 2012; Sokchea & Culas, 2015; Ragasa et al., 2018; Nhan & Yutaka, 2019; Benalywa et al., 2019; Bidzakin et al., 2019; Harish 2019a; Tekalign, 2019; Rondhi et al., 2020; Ruml & Qaim, 2021; Hoang, 2021; Baqutayan et al., 2021; Glover & Kusterer, 1990).
2. Farmers' income is influenced by characteristics such as education of head, gender of head, kind of crop and technology (Hoang, 2021).
3. Participation in contract farming leads to greater technical efficiencies and productivity (Kusnadia & Paramitab, 2019).

4. Land area has significant effect on productivity (Besar et al. 2020; Utama et al., 2022). No significant difference in productivity among dry land and wet land farms (Lifianthia & Husina, 2012).
5. Farmers' decision to take part in CF are positively impacted by factors such as education, land size, population, farmer groups, and agricultural extension (Rondhi et al., 2022).
6. Formal contract farmers are having more technical efficiency that those of informal or non-contract farmers (Kusnadia & Paramitab, 2019; Alulu et al., 2021).
7. Decline in productivity of the contract farmers was observed (Hoang, 2021).
8. Non-compliance of recommended technical standards caused lower productivity among small holders (Anwar et al. 2014).
9. Inefficiency of land use by small holder oil palm plantations do more harm than the benefits accrue from it (Sari et al. 2021).
10. Productivity is constraint by low soil nutrients (Rhebengen et al., 2015).
11. Most farmers are naturally risk-averse (Adnan et al., 2019). Contract farming lowers farm-level risk (Tekalign, 2019).
12. As long as farmers opt for low-input low-output system for various reasons, initiatives such as improving access to finance or good planting materials are not likely to significantly improve the productivity and sustainability of small holder oil palm sector (Jelsma et al., 2019). Farmers' organization could play an important role in integrating smallholder farmers into the contemporary food supply chain (Luh, 2020).
13. Contract farming favours large farmers as costs rising from repeated transactions are lower for buying firms when dealing with larger farmers (Sänger, 2012; Luh, 2020) and could cause marginalisation of small farmers (Martiniello, 2021). Contract farming is not a sensible policy instrument that can assist farmers boost their income and enhance their level of food security (Bolwig, 2012; Olounlade et

al., 2020). Capital-intensive practice in contract farming could result in negative effect on profitability (Ragasa et al., 2018).

14. Contract farming could be quite exploitative due to the imbalance bargaining power, and also, ineffective as a development approach to connect small-scale farmers to profitable agricultural markets (James, 2015; Musa et al., 2018; Chingosho et al., 2020). Small-scale farmers who grow food for their own consumption had an average net income that was seven times higher than that of small-scale oil palm growers (World Growth, 2011). It is needed to strike a balance between the cultivation of cash crops and food security. Global price fluctuations may also pose risk to the farmers. (Vermeulen et al., 2006).
15. Good seed treatment and adequate doses of fertiliser are important for farmers' prosperity and productivity (Hendiansyah et al., 2020). The age of oil palms and income were positively correlated (Rao, 2013).
16. Side-selling beyond the contract agreement was found in case of some contract farming practices (Tekalign, 2019; Ncube, 2020; Mugwagwa et al., 2020; Solazzo et al., 2020).
17. Researchers were applying various methodologies and simple random sampling technique was commonly used for selecting samples. Structured questionnaires were used for collecting data (Owolarafe et al., 2007; Ibitoye et al., 2011; Madhavi et al., 2015; Chingoso et al., 2020; Angreheni et al., 2022) while structured interview schedules were also used (Agwu, 2006; Ajieh et al., 2013).
18. Stochastic Frontier production function was used to measure the technical efficiency (Kusnadia & Paramitab, 2019; Alulu et al., 2021; Sari et al., 2021). Tobit model was also employed (Alulu et al., 2021).
19. Regression analysis was also applied by various researchers (Ibitoye et al., 2011; Damoah, 2012; Onoh et al., 2012; Dubbert, c. 2019; Nhan & Yutaka, 2019; Bidzakin et al., 2019; Kisnadia & Paramitab, 2019; Anh et al. 2019; Rondhi et al., 2020; Rakahni et al. 2020; Hasibuan et al., 2020; Besar et al., 2020; Ruml & Qaim, 2020; Utama et al., 2021).

20. ANOVA is applied by Rao (2013) and Herdiansyah et al. (2020).
21. Correlation was applied by various researchers (Damoah, 2012; Rao, 2013; Bidzakin et al., 2019; Ibitoye et al., 2011; Hendiansyah et al., 2020; Rondhi et al., 2020). Chi-square was applied by some researchers (Owolarafe et al., 2007; Ibitoye et al., 2011; Damoah, 2012; Rao, 2013). T-test was also employed by some researchers (Ibitoye et al., 2011; Nhan & Yutaka, 2019; Angreheni et al., 2022).

From the above literatures, it can be seen that contract farming, though without criticism, is an important tool for the development of small farmers. With the rapid growth of population and fast depletion of natural resources, contract farming with implementation of Good Agriculture Practice could be an effective tool to attain the Sustainable Development Goals (SDGs). As seen in the literature, intensification of land use could prevent further deforestation by producing more oil from the same area of land and by more efficient use of labour. From the experience of contract farming in various parts of the globe, the status of contract farming in the state of Mizoram would be analysed and it is expected to identify areas for improving the implementation.

From the literatures on contract farming, comparison of the services given by the contracting firms and its impact on the performance of the farmers was not seen. Comparative study of the services offered by the various firms or companies would be of academic interest area of research. The present study tries to fill this gap.

3. OVERVIEW OF CONTRACT FARMING IN INDIA

3.1 History of Contract farming in India

The history of contract farming in India dates back to the introduction of opium and indigo production by Europeans in the Bengal Region under the East India Company Regulation (Ray et al. 2020). The East India Company, which was founded in 1612, was the first British establishment in India. The objectives of the Company was to trade with India in various commodities like silk, indigo, cotton, spices, etc. (Victorian Era, n.d.). Imperial Tobacco Company of India Limited (ITC Ltd.) started growing Virginia tobacco in the 1920's and Potato and tomato cultivation by Pepsico in 1927 among the milestones in contract farming in India. New models and types of contractual

agreements have evolved following independence (Ghosh, 2003). The Central Government of India initiated formalisation of contract farming system since the green revolution in the country and through which the government provided subsidised fertilisers, pesticides, high yielding variety seeds and skill training. The Model Agricultural Produce Marketing Committee (APMC) Development & Regulation Act was circulated to the states by the central government which has a provision for contract farming (Ray et al. 2020). APMC was implemented in few states and it opens the gate for the involvement of the private companies and cooperatives to establish market and do contract farming (Chand, 2012).

Contract farming has been used for the production of seeds in India since the 1960s and currently, utilised for the production of poultry, dairy products, potatoes, rice, and spinach, among other things (Rehber, 2007). It is a continually evolving process.

From the literatures pertaining to contract farming in India, advantages and disadvantages of contract farming in respect of Indian agriculture could be seen, which may be summarised as follows:

a) In most cases, contract farming results in higher productivity and higher income (Dileep et al., 2002; Singh, 2002; Kumar et al., 2008; Mishra et al., 2018; Behera & Swain, 2021).
b) Contract farmers used more inputs than the non-contract farmers (Singh, 2002).
c) Input support from the sponsor or from the government is required as the contract crops needs more inputs (Sharma, 2016).
d) Contract farmers are having more security in terms of input and marketing of output (Mishra et al., 2018).
e) Many contracting firms are bias toward large farmers and small farmers are left behind in many cases (Dileep et al., 2002; Singh, 2002; Sharma, 2016).
f) Contracting firms are also observed to be shifting from one farmer to another farmer or to other region when productivity declines (Swain, 2012; Narayan, 2014).

g) Side-selling were also practiced by some farmers when the market price was higher than the contract price (Dileep et al., 2002).
h) Contract farming was practised in the country where there exist written and oral agreement side by side (Swain, 2002).
i) Legal backup is required to avoid exploitation of the farmers as well as contract breach by the farmers (Nagaraj et al, 2018).
j) Transportation problem remains a major challenge in marketing the farm produce (Dileep et al., 2002; Kumar et al., 2008).

3.2 Legalities of Contract Farming in India

The above observation shows clearly that the contract farming system in the country needs to be regulated with legal back up. After thorough studies and consultation, the Central Government came up with three (3) bills related to agriculture and were passed in the Parliament.

The Bills — The Farmers Produce Trade and Commerce (Promotion and Facilitation) Bill, 2020 (FPTC); The Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Bill, 2020 (FAPAFS); and The Essential Commodities (Amendment) Bill, 2020 (ECA) were passed in the Parliament and became Acts after the assent of the President of India. Due to the farmers' protest against the Acts, the Supreme Court of India ordered the Acts to be put on hold and appointed a panel to submit a report on the Acts (Barik, 2020).

The Act is expected to attract more business firms to participate in contract farming thereby, eliminate monopolistic exploitation of farmers. Some of the drawback of the Contract Farming Act, 2020 as highlighted by Barik, (2020) are as follows:

i. The method of price determination is not given in the Act.
ii. Provision of required inputs to maintain quality harvest is not specified in the Act, which may lead the farmers to rely more on the sponsor and infrastructural support from the government is also absent.
iii. No provision of support to production loss due to low soil productivity and poor management are not made.

iv. The Act does not made provision for ensuring full participation of the resource-poor farmers (prevention of the sponsors of bias selection).

v. Concentration on high value crop production may in the long run deteriorate the food security of the country and may have adverse environmental impact, for which provisions may be made.

It has been found that contract farming has significant contribution in the development of agriculture in the country. Various researchers have made suggestions for improvement and Central Government, on realising the requirement for legal back up, passed Contract Farming Act, 2020 in the Parliament.

4. INSTITUTIONAL SETTINGS OF CONTRACT FARMING IN MIZORAM

Contract farming is new to Mizoram and it was introduced with cultivation of oil palm under The Mizoram Oil Palm (Regulation of Production and Processing) Act, 2004, which had been passed in the Mizoram Legislative Assembly.

4.1 General Information about the State

Mizoram covers an area of 21087 square kilometres. Total population as per 2011 census is 1,097,206, out of which male are 555,339 and female are d 541,867. Literacy rate (census 2011) of 91.33% is higher than the national average and it has a sex ratio of 976. Agriculture is the main source of occupation and about 60% of the population are engaged in agriculture and allied activities. Rice is the staple food of Mizoram. Agriculture census 2015-16 showed total operated area at 112464.71 ha and about 32% of agriculture workers are engaged in shifting (jhum) cultivation. As per the Forest Survey report 2021, Mizoram is having the largest percentage of forest cover in the country with 84.53% of its geographical area. Rapid land degradation due to shifting cultivation has to be tackled effectively in order to avoid environmental and ecological loss. Therefore, encouraging permanent cultivation is the need of the hour.

4.2 Edible Oil Requirement in India & Rising Palm Oil Import

India's edible oil import bill increased by 34.18% to Rs 1.57 trillion in the oil year ending in October 2022, while the volume increased by 6.85 percent to 140.3 lakh tonnes, according to the Solvent Extractor Association of India (Business Standard, February 11,

2023). India's palm oil import was 2696 thousand mt in 2001 which grew to 7201 thousand mt after ten years in 2011, i.e. by 167% during 10-year period. The import during 2021 was 7800 thousand mt, which was almost 189.32% of the demand in 2001, twenty years ago.

4.3 Oil Palm Development Programmes of India

In order to meet the edible oil requirement in the country, the National Oil Palm Development Program is implemented by the Oilseeds Division, Department of Agriculture, Co-operation and Farmers Welfare The programmes which have been implemented for the development of oil palm are: (i) Technology Mission on Oilseeds (TMO) – 1986; (ii) Technology Mission on Oilseeds and Pulses (TMOP) - 1991-92; (iii) Integrated Scheme of Oilseeds, Pulses, Oil Palm & Maize (ISOPOM) – 2004-2005; (iv) Oil Palm Area Expansion (OPAE) - 2011-2012; (v) National Mission on Oilseeds and Oil Palm (NMOOP) - 2014-2015; (vi) National Food Security Mission- Oil Palm - 2018-19 (vii) National Mission on Edible Oils - Oil Palm (NMEO-OP) – 2021-22 .

4.4 Potential Area for Oil Palm Cultivation in Mizoram

Oil Palm has to be grown in areas below 900 meter (MSL) and the District wise Oil Palm potential area as assessed in the year 2020 with a total area of 66791 ha in Mizoram making up 3.17% of the total geographical area of the state (DoA, GoM, n.d.).

4.5 Oil Palm Cultivation under Contract Farming System in Mizoram

The Mizoram Oil Palm (Regulation of Production and Processing) Act, 2004 (Act No. 10 of 2004) was passed by the Mizoram Legislative Assembly and obtained the Governor's assent on December 2, 2004. The Integrated Scheme of Oil Seeds, Pulses, Oil Palm & Maize (ISOPOM) programme has been in place in Mizoram since 2004-2005 after receiving administrative approval from the Ministry of Agriculture and Cooperation. Government of India. Since then, all the subsequent programmes for oil palm development introduced by the Central Government have been implemented in the state.

4.6 Institutional Setting for Contract Farming in Mizoram

Mizoram started oil palm under contract farming system in a Public Private Partnership (PPP) mode involving the state government, companies (sponsor) and the

farmers (oil palm growers).

Secretary, Agriculture Department, Government of Mizoram was appointed as Oil Palm Officer to exercise the power and perform the function for implementation of Oil Palm Act. The concerned District Agriculture Officers were appointed by the Government of Mizoram as Oil Palm Inspector in their respective jurisdiction as required under Oil Palm Act, 2004.

As per the provision in the Oil Palm Act, various committees at at different levels have been constituted for the development of Oil Palm cultivation in Mizoram, which includes:

1. State Level Oil Palm Advisory Committee (Annexure III)
2. Project Management Committee (Annexure IV)
3. Price fixation Committee on Oil Palm FFBs (Annexure V)
4. District Level Oil Palm Zonal Committee (Annexure VI)
5. Village Level Oil Palm Growers Association

5. ANALYSIS OF OIL PALM PRODUCTION AND SUPPLY CHAIN

5.1 Introduction

Data were collected from 380 sample respondents through well-structured interview schedule. However, it was found that only 285 farmers were producing oil palm FFBs and the data were analysed using SPSS software and Microsoft Excel.

5.2 Palm Oil Supply Chain in Mizoram

Godrej Agrovet Ltd. having the only palm oil mill in the state. FFBs collected by other company and the Department of Agriculture are also sold to the Godrej Agrovet Ltd. and the Crude Palm Oil (CPO) produced by Godrej Agrovet Ltd. is sold to the Brokers who further transport it and sell it to the refineries in Kolkata.

5.3 Performance of the Sponsor/Contracting Firms

Officials from Godrej Agrovet Ltd. and Patanjali Food Ltd. responded to the questionnaires and the responses shows that Patanjali foods Ltd. have more farmers from more number of villages but produced significantly less fresh fruit bunches. Both the companies graded their own performances as “Very Good”. Difficult topography with

poor infrastructure like road connectivity are the problems faced by the companies. Godrej Agrovet Ltd. is having 40 new farmers in 2021-22 while Patanjali Foods Ltd. is not having new farmer during the period.

They said that they had no institutional constraint but untechnical maintenance, poor care of the gardens by the farmers, poor road connectivity were mentioned as their problems. They agreed that the oil palm growers association help in improvement of the performance of the growers in their respective villages. However, they suggest that they have to be linked properly and to be looked after properly by the department. They also suggest correct and timely release of Central Assistance to the farmers.

5.4 Socio-Economic Conditions of the Oil Palm Farmers

5.4.1 Age of the respondents

The study found that the mean age of 285 farmers was 59 years with a minimum age of 24 years and a maximum age of 99 years.

5.4.2 Available Workforce

The total available work force was 877 comprising 54.70% of the total population.

5.4.3 Gender of the Respondents

Among the respondents, 91.2% were male and 8.8% were female.

5.4.4 Educational Qualification of the Respondents

Educational attainment of the respondents are: Illiterate-3.9%, primary- 28.4%, middle-38.9%, High School-21,8%, HHS-5.3% and Graduate & Above-1.8%.

5.4.5 Marital Status of the Respondents

Majority of the respondents comprising 81.8% were married, 4.6% were single or unmarried and 4.9% were divorcees while 8.7% were widows or widowers.

5.4.6 Economic Status of the Respondents' Families

The economic status of the respondents' families are APL[1] (60.7%), BPL[2] (30.9%) and AAY[3] (8.4%).

5.4.7 Housing Status of the Respondents

The housing status of the respondents are- pucca houses (16.1%), semi-pucca houses (82.1%) and kutcha houses (1.8%).

5.4.8 Ownership of Farm Lands

The status of landholdings is 6.7% hold Land Settlement Certificate (LSC)[4], 33.7% hold Periodic Patta (P.Patta)[5] 59.3% were holding Village Council Pass (VC Pass)[6] issued by the Village Councils.

5.4.9 Suitability of Farm Land

Amongst the 285 farmers, 19.3% claimed it moderately suitable; 66.7% perceived it suitable and 14% claimed very much suitable for cultivation of oil palm.

5.4.10 Impact of Socio-Economic factors on the Production of FFBs

Multiple regression analysis results showing a very small impact of the socio-economic factors, viz. age, gender, educational qualification, marital status and

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[1] Above Poverty Line is meant to those families who are having white ration cards issued by the State Govt. for issue of food grains under the Public Distribution System with less subsidy.

[2] Economically disadvantaged households who are given blue coloured ration cards by the State Government for procurement of food grains from the PDS at a subsidised rate.

[3] In order to make Targeted Public Distribution System more focused and targeted towards the poorest of the poor families, "Antyodaya Anna Yojana" (AAY) was launched in December, 2000

[4] Land Settlement Certificate (LSC), which is permanent, heritable and transferable, could be issued exactly to the area covered in the Periodic Patta, if the land is reclaimed or developed for the intended purpose.

[5] Periodic Patta could be issued by the Revenue Officer for agriculture and allied purposes, valid only for initial 5 years, which shall automatically lapse unless reclaimed, prepared or developed.

[6] The Lushai Hills District (Village Council) Act 1953 authorised the Village Council to allot a particular region within the boundaries of each village for *jhums/shifting cultivation* each particular year. However, the Village Council used to issue VC Pass for allotment of site for plantations, which has no legal back up, but yet commonly practiced. The Mizoram (Land Revenue) Act, 2013 (Act 5 of 2013), however, does not render the power to allot land for plantation to the Village Councils.

economic status of the family, on the quantity of fresh fruit bunch (FFBs) harvest of the farmers. The ANOVA table exhibit [F (5,279) = 2.043, p = .073 > .05] with an R^2 of .035, which implies that the socio-economic factors are not good predictors of the quantity of FFB harvest or in other words, the socio-economic factors under analysis do not have significant impact on the quantity of FFB harvest.

Therefore, we failed to reject the hypothesis 1, which states that "*Socio-economic conditions of the oil palm contract farmers do not have significant impact on the quantity of the fresh fruit bunch (FFB) production".*

5.5 Performance of Contract Farmers

5.5.2 Main Source of Income of the Oil Palm Contract Farmers

The top five main income sources of the respondents were oil palm farming, shifting cultivation, wage labour, government service and seasonal farming.

5.5.2 Land Use Diversification

Out of the total land holdings, 52.91% were used for oil palm cultivation, 22.16% were used for cultivation of other crops and 24.88% were kept as forest.

5.5.2.1 Land Utilisation for Oil Palm Cultivation

Average of oil palm cultivation by the 285 contract farmers was 2.60 ha per farmer with a total area of 740.27 ha.

5.5.3 Stage of Oil Palm Plant

The total number of oil palm seedling planted by the 285 sample farmers was 138079, out of which 80136 (58%) are already matured and 24,724 (18%) are still not mature. At the same time, 33,219 (24%) died due to various reasons. The high mortality also need special attention for the development of the oil palm cultivation.

5.5.4 Irrigation Practice

Only 7.7% practised irrigation while 92.3% did not practise irrigation.

5.5.5 Use of Agriculture Inputs and Expenditure

Herbicide is applied by 57.19% for clearing weeds and only 4.21% applied insecticides. Fertiliser in applied by 54.33% and 46.7% did not apply fertilisers. The per capita application of herbicide was 2.06 litres per year per ha, 0.19 litres of

pesticides per year and 1.47 quintals of fertilisers per capita per year. Regression analysis results shows that amount of agricultural inputs such as fertilisers and herbicides were having significant impact on the quantity of FFB harvested at .01 level, while irrigation had positive but not significant impact and the impact of insecticide application was not significant. The result implies that more application of herbicides and fertilizers could lead to increased production of FFBs. However, care should be taken to avoid ecological deterioration for sustainable production.

5.5.6 Impact of Training Attendance on Production of FFB

An independent samples t-test shows that there was significant difference in average production of oil palm FFBs between those who attended trainings (M = 51.84, SD = 28.322) and those who did not attend trainings (M = 37.09, SD = 26.126) conditions, t (282) = 2.799, p = .005. At the same time, it was found that there was also significant difference in the average productivity of those who had attended the trainings (M = 51.63, SD = 28.538) and those who did not attend the trainings (M = 39.00, SD = 24.553) conditions, t (282) = 2.393, p = .017.

5.6 Materials and Other Supports received by the Farmers

Farmers were asked the materials and support received from the Government and the companies. All the farmers received oil palm seedlings. The other support received by farmers were cultivation cost, maintenance cost, cost for half-moon terrace, water pipe and drip irrigation, cost for water tank, harvesting tools, gloves, guide book, etc.

5.7 Farm Visits by Officials

The study finds that 56.5% of the farms had never been visited by officials. This is against the claim by the Companies that they visited more than 80% of the plantations. The officials of the company and the Agriculture Department may arrange joint verification and monitoring so that no farmers were left behind.

5.8 Farmers' Satisfaction with the Company's Performance

The study finds that 33% of the farmers were satisfied with the company while 63.5% were not satisfied.

5.9 Use of Labour in Oil Palm Cultivation

The total annual labour man-days spent were 31,649 man-days, out of which 9,954 (31.45%) were hired labour and 21,695 (68.55%) were family labour. The activities includes weeding, harvesting FFBs and transporting the FFBs.

5.10 Farmers' Intension for More Planting of Oil Palm

Only 25.3% intends to plant more while the rest 74.7% were not intending to plant more oil palm. Farmers cited various reasons for their decision not to plant more oil palm. The top five most common reasons cited by the farmers are Low Rate of FFB (17.9%), Non-availability of vacant land (10.9%), Non-profitability (10.9%), Transportation problems (6%) and Labour-intensive nature of works (4.2%).

5.11 Uprooting of Oil Palm Tree & Reasons

The study finds that 36 farmers (12.6%) have uprooted some of the oil palm trees due to various reasons. A total number of 1667 oil palm trees had been uprooted by 36 farmers with an average number of trees uprooted per farmer amongst the 36 farmers was 40 trees. Most of the reasons for uprooting of oil palm trees might have been avoided with good planning and management.

5.12 Marketing Fresh Fruit Bunches (FFBs) of Oil Palm

As Patanjali Foods Ltd. have not establish Palm Oil Mill, Godrej Agrovet Ltd. started procuring FFBs from them and the purchase from Patanjali Foods Ltd. amounts to 700 mt since April, 2022 up to November, 2022.

5.12.1 Distance of Collection Centres from Plantations

It is observed that the farmers had to carry their FFBs covering an average distance of 3.23 kilometers, i.e. to the collection centres. In order to reduce farmers' expenditure on transportation cost, the Companies should establish more Collection Centres near the plantations of the farmers.

5.12.2 Importance of Farms' Accessibility

Only 51.6% were accessible by vehicles while 48.4% were not accessible by vehicles. The impact of farms' accessibility on the quantity of FFBs harvest was tested

using independent samples t-test. The result shows that accessibility of the farm land/plantation by vehicle has significantly positive impact on the production of FFBs.

5.12.3 Production of FFB under Different Companies

A one-way ANOVA was conducted to compare the effect of the companies' performance viz. Godrej Agrovet Ltd., Patanjali Foods Ltd. and 3F Oil Palm Agrotech Ltd. on the quantity of FFB produced. Farmers under Godrej Agrovet Ltd. had produced significantly more than the farmers under Patanjali and 3 F Oil Palm Agrotech Ltd.

5.12.4 Productivity of Farms under Different Companies

A one-way ANOVA shows that there was significant difference in the productivity of the farmers under the three companies at the p = .01 level for the three conditions [F(2,281) = 20.521, p = .000001]. Post hoc comparison using Games-Howell test indicated that the mean productivity of the farmers under Godrej Agrovet Ltd. (M = 57.19, SD = 26.483) was significantly higher than Patanjali Foods Ltd. (M = 34.41, SD = 23.762) but no significant difference was found with 3F Oil Palm Agrotech Pvt. Ltd. (M = 45.70, SD = 35.579) though with more productivity. There had been no significant difference between the mean level of productivity by the farmers under Patanjali Foods Ltd. and 3F Oil Palm Agrotech Ltd. (presently taken over by the Department of Agriculture, Govt. of Mizoram due to withdrawal of the company).

5.12.5 Cost-Benefit Analysis

Labour costs includes the family labours and hired labours at a daily wage rate of Rs. 350.00 per day. Costs of hiring vehicle, herbicides, pesticides, fertilisers and other miscellaneous costs were added in the expenditure side. The total income (benefit) from oil palm was Rs. 1,98,05,445 while the total expenditure (cost) was Rs. 1,52,12,379 making a net income of Rs. 45,93,066 for the whole samples. The Benefit-Cost Ratio was calculated to be 1.3.

5.12.6 Profit and Loss Statement of the Sample Farmers

The study found the Benefit Cost Ratio of 1.3 implying an investment in oil palm cultivation is having a net profit of 30%. However, the expenditure incurred and the income accrued from oil palm cultivation of each and every farmer was studied in

detail. Only 118 farmers or 41.4% were profiting from oil palm cultivation while majority of the sampled farmers comprising 167 farmers or 58.6% were incurring losses due to the oil palm cultivation. The study further finds that the average age of oil palm plantations was 9.73 years and considering the low productivity at 4.00 mt per ha with almost 60% of the farmers still incurring losses, the economic viability of the oil palm cultivation in the state is doubtful under the prevailing condition.

5.13 Problems Faced by Oil Palm Contract Farmers

The top five amongst the main problems cited by the farmers were Low rate of FFB (54.04%), Transportation Problem (22.11%), Financial Problems (14.39%), Wild Animal Attack (3.86%) and Lack of Technical Support (2.46%). The other problems cited by the farmers include Irregular Cash Transfer, Requirement of Harvesting Tools, Irregular Collection of FFB by the Company, Lack of Proper Training, Problems due to Long Trunk of the Oil Palm Trees, Negligence by the Department and Lack of Fertiliser.

6 FINDINGS, CONCLUSIONS & SUGGESTIONS

6.1 FINDINGS

The findings of the research is further divided into two sections, viz., findings in relation to the study objectives and findings to prove the research hypotheses.

6.1.1 Findings in Relation to Study Objectives

Objective 1: *To examine the socio-economic profile of the oil palm contract growers*

The mean age of the oil palm farmers in the state was 59 years which shows that the farmers were rather old and beyond active economic age. Among the respondents, 91.2% were male and female comprised only 8.8%. The highest number of respondents (60.7%) were from Above Poverty Line (APL) families while 30.9% were from Below Poverty Line (BPL) families and 8.4% were from Antyodaya Anna Yojana (AAY) families. Besides oil palm cultivation, the other top 5 important occupations of the farmers were other plantations (36.1%), wage labour (26.3%), livestock farming (20.4%), shifting cultivation (20%) and seasonal farming (12.6%). Main source of income of the oil palm farmers was asked and only 37.5% were using oil palm cultivation as their main source of

income while 12.6% were having shifting cultivation as their main source of income, 10.9% were using wage labour as their main source of income, 8.4% used government service as their main source of income and 6.7% were having seasonal farming as their main source of income. The average area of total landholdings of the oil palm farmers was 4.91 ha, average oil palm cultivated area was 2.6 ha, other copped area was 1.1 ha, while area kept as forest was 1.22 ha per farmer. Here, it could be observed that about 52.95% of the total landholdings was utilised for cultivation of oil palm. And the total oil palm cultivated area of all the respondents was 740.27 ha. The numbers of fresh farmers who joined oil palm contract farming after 2009 remained low. Among oil palm plants of the respondents, 58% were mature, i.e. bearing fruits, 18% were immature, i.e. not yet bearing fruits, while the mortality rate was surprisingly high at 24% of the oil palm seedling planted. The various reasons of high mortality of plants include animal attack, uprooting of the plants, etc.

Objective 2: *To identify the inputs (materials and technical) provided to the farmers*

1) Godrej Agrovet Ltd. and Patanjali Foods Ltd. did not provide material inputs, however, they claimed that they have provided technical inputs by visiting the farms or though trainings. Godrej Agrovet Ltd. claimed that they provided fertilisers on demonstration purposes in some cases.
2) The Department of Agriculture, Government of Mizoram provided various kinds of assistance to the farmers including oil palm seedlings purchased from the companies, cultivation cost, maintenance cost, cost for half-moon terrace, water pipe and drip irrigation, cost for water tank, harvesting tools, gloves, guide book, etc. The distribution of assistance to the farmers appears to be uneven as some of the farmers have stated that they did not receive assistance as per their performance.
3) Among the farmers, 11.2% have not attended trainings and 56.5% of the oil palm farmers stated that their plantations had never been visited by the officials from the company or the Agriculture Department.
4) The oil palm seedlings received were graded ‘Good’ by 88.8% of the farmers. And received by only 35.8% in the ‘planting season’.

5) From the above findings, it could be seen that there is room for improvement in relation to the provision of the inputs (materials and technical), for the development of oil palm cultivation under the contract farming system.

Objective 3: *To analyse the performance of contract farmers to comply with contract requirements.*

1) Around 11% of the farmers did not attend the training.
2) Only about 60% of the farmers planted at the recommended triangular spacing of 9m X 9m X 9m distance.
3) Almost 13% of the farmers have uprooted a total number of 1,667 oil palm trees due to reasons without consent from the company or the Department of Agriculture.
4) Irrigation was practised by 7.7% only and minimal quantities of agricultural inputs were applied by the farmers. Herbicides was applied by 57.19% with the inputs per ha was 2.07 litres only; insecticide by 4.21% with 0.072 litres per ha and fertiliser by 53.3% with 0.56 quintals per ha. Out of the total annual expenditure on oil palm cultivation, the share of fertilisers was very less at 5.39% only.
5) Palm oil was extracted by 7% of the farmers by themselves and sold the oil from which they claimed that they could get more money than selling the FFB to the company. This is against the contract terms which impels that all the FFBs should be sold to the concerned company only.
6) From the above observations, it is could be seen that the performance of the farmers also need improvement through technical guidance, proper monitoring and addressing the problems encountered by them.

Objective 4: *To assess the performance of contracting firms in the delivery of materials and services.*

1) Many of the seedling supplied by the companies are not satisfactory and not in planting season as could be seen from the response of the farmers.
2) The average distance of collection centre from the plantation was 2.46 kilometres need to be reduced.

3) Some farmers complained of non-collection of FFBs by the companies and there were cases where farmers complained about delayed payments from the company.
4) Only 33% of the farmers were satisfied with the performance of the companies.
5) It could be seen that the contracting companies also have good scope for improving their performance which would further boost the performance of the farmers.

Objective 5: *To evaluate the operational and institutional constraints for the success of contract farming*

1) Untechnical maintenance and poor care of plantations by the farmers were posing problems in production of oil palm fresh fruit bunches.
2) Many farmers were having problems of transportation due to poor roads or absence of roads connecting to the plantations. Out of an annual labour force spent on management of oil palm farms, 23.1% was used for transportation of the FFBs, which shows the genuineness of transportation problem faced by the oil palm farmers and the requirement for improvement of roads.
3) The low rate of FFB was one of the main problems, which is being addressed with revision of the price with effect from the 1st April, 2022 and subsequent adoption of the Central Price Formula.

6.1.2 Findings in relation to Research Hypotheses

The study tested 7 null hypotheses and the results are given in this section.

Hypothesis 1: *Socio-economic conditions of the oil palm contract farmers do not have significant impact on the quantity of the fresh fruit bunch (FFB) production.*

The impact of the socio-economic parameters like age, gender, educational level, marital status and economic status of the family on the quantity of FFB harvested were tested using multiple regression analysis. The ANOVA table exhibit [$F(5,279) = 2.043$, $p = .073 > .05$] with an R^2 of .035, which implies that the socio-economic factors are not good predictors of the quantity of FFB harvest or in other words, the socio-economic factors under analysis do not have significant impact on the quantity of FFB harvest.

Therefore, we failed to reject the hypothesis 1, which states that "*Socio-economic conditions of the oil palm contract farmers do not have significant impact on the quantity of the fresh fruit bunch (FFB) production".*

Hypothesis 2: *Trainings provided to the farmers does not have significant impact on the production of FFB.*

An independent samples t-test result shows that the average production of those who attended trainings (M = 51.84, SD = 28.322) was significantly higher than those who did not attend trainings (M = 37.09, SD = 26.126) conditions, t (282) = 2.799, p = .005.

Therefore, hypothesis 2, which states that the "*trainings provided to the farmers does not have significant impact on the production of FFB"* is rejected.

Hypothesis 3: *Trainings provided to the farmers does not have significant impact on the productivity of FFB.*

The average productivity of those who attended the training and those who did not attend the training was tested using an independent samples t-test, which shows that the average productivity of those who had attended the trainings (M = 51.63, SD = 28.538) was much higher than that of those who did not attend the trainings (M = 39.00, SD = 24.553) conditions, t (282) = 2.393, p = .017.

Therefore, hypothesis 3, which states that *"trainings provided to the farmers does not have significant impact on the productivity of FFB"* is rejected.

Hypothesis 4: *There is no significant difference in production of FFB among the contract farmers under the selected 3 companies.*

A one-way ANOVA was conducted to compare the effect of the companies' performance viz., Godrej Agrovet Ltd., Patanjali Foods Ltd. and 3F Oil Palm Agrotech Ltd. on the quantity of FFB produced by the farmers. There was significant difference in the amount of FFBs produced by farmers under the three companies at the p = .01 level for the three conditions [F(2,281) = 28.411, p = .0001]. Post hoc comparison using Games-Howell test indicated that the mean score for the farmers under Godrej Agrovet

Ltd. (M = 58.48, SD = 26.468) was significantly higher than Patanjali Foods Ltd. . (M = 34.54, SD = 23.114) and 3F Oil Palm Agrotech Pvt. Ltd. (M = 31.26, SD =32.60). However, there had been no significant difference between the mean level of FFB production by the farmers under Patanjali Foods Ltd. and 3F Oil Palm Agrotech Ltd. (presently taken over by the Department of Agriculture, Govt. of Mizoram due to withdrawal of the company). Farmers under Godrej Agrovet Ltd. had produced significantly more than the farmers under Patanjali and 3 F Oil Palm Agrotech Ltd.

Therefore, hypothesis 4 stating that *"there is no significant difference in production of FFB among the contract farmers under the selected companies"* is rejected.

Hypothesis 5: *There is no significant difference in productivity of FFB among the contract farmers under the selected 3 companies*.

A one-way ANOVA shows that there was significant difference in the productivity of the farmers under the three companies at the p = .01 level for the three conditions [F(2,281) = 20.521, p = .000001]. However, post hoc comparison using Games-Howell test indicated that the mean productivity of the farmers under Godrej Agrovet Ltd. (M = 57.19, SD = 26.483) was significantly higher than Patanjali Foods Ltd. (M = 34.41, SD = 23.762) but no significant difference with 3F Oil Palm Agrotech Pvt. Ltd. (M = 45.70, SD = 35.579) though with more productivity. There had been no significant difference between the mean level of productivity by the farmers under Patanjali Foods Ltd. and 3F Oil Palm Agrotech Ltd.

From the ANOVA results, hypothesis 5, which states that *"there is no significant difference in productivity of FFB among the contract farmers under the selected 3 companies"* is rejected and it may be said that there is significant difference in the productivity of FFB among the contract farmers under the selected 3 companies.

Hypothesis 6: *Contract farming does not result in significant improvement in the productivity of the contract farmers.*

The average age of oil palm plantations was 9.73 years. According to the "*Oil Palm Development Programme in Mizoram*" issued by the Department of Agriculture, Govt. of Mizoram on its website (n.d.), the productivity of oil palm tree at the age of 9

years was 18 mt of FFBs per ha per year. The average production at age 4 is also 5 mt per ha per year which have not been achieved with the present production of 4.00 MT/Ha/Year. The achievement was 22.22% of the target productivity and the Z-statistics was not significant in case of improvement in productivity (Ho: P=0.50 & H_1: P>.50). Therefore, we failed to reject the hypothesis stating that *"contract farming does not result in significant improvement in the productivity of the contract farmers".*

Hypothesis 7: *There is no significant effect of the farm's accessibility to the FFB production of the contract farmers.*

The impact of farms' accessibility on the quantity of FFBs harvest was tested using independent samples t-test. The results shows that the FFBs harvested by those farms accessible by vehicles (M = 53.66, SD = 30.30) was significantly higher than those farms which were not accessible by vehicles (M = 46.50, SD = 25.90) conditions; t (282) = 2.136, p = .034, where equal variances are assumed. It can be said that accessibility of the farm land/plantation by vehicle has significant impact on the production of FFBs at .05 level.

Therefore, hypothesis no 7, which states that *"there is no significant effect of the farm's accessibility to the FFB production of the contract farmers"* is rejected.

6.2 CONCLUSION

The present study reveals that the pace of oil palm cultivation under contract farming has been decelerated due to the problems encountered by the farmers. While the cost-benefit ratio was found to be 1.30, an in-depth study found that more than 50% of the farmers have been incurring losses. At the same time, the revision of price of FFB with effect from 1st April, 2022 and subsequent adoption of Central Price Formula is showing positive results in the minds of the farmers. The average productivity of 4 MT/ha was only 22.22% of the anticipated productivity (18MT/HA/YR) in the state. This suggests that the low agricultural inputs application and the problems of transportation need prior attention. The study finds that the performance of Godrej Agrovet Ltd., having established palm oil mill, was doing better in terms of production and productivity than Patanjali Foods Ltd. and 3F Oil Palm Agrotech Pvt. Ltd. who have not yet establish palm oil mill. This

indicates that the establishment of mill gives assurance of the market to the farmers which enhanced production and productivity. Area expansion or intensification of oil palm cultivation requires developed transportation system which could be achieved only if cluster approach is followed, where forward and backward linkages could be assured.

6.3 SUGGESTIONS

6.3.1 General

Palm oil mill may be established by all the companies involved in oil palm development in the state. More collection centres need to be established by the companies in all the oil palm growing villages. For wide dissemination of information about oil palm cultivation and best management practices to achieve higher production and productivity, social media should be utilised through advertisement and broadcasting of success stories, best management practices, etc. under the National Mission on Edible Oils - Oil Palm (NMEO-OP) and other schemes of the government.

6.3.2 Socio-economic Factors

The mean age of the oil palm contract farmers in the state was 59 years which was beyond the active economic age. In order to give vigour to the sector, more involvement of the youth and women should be encouraged.

6.3.3 Performance of the contract farmers

The average cultivated area of 2.6 ha need to be enhanced to make it an economic activity to attract prospective farmers. The high mortality rate of oil palm plants at 24% is of serious concern and immediate action need to be taken. Inter-crop plants of annual or seasonal varieties may be promoted which could give immediate returns to the farmers on the one hand and which would not compete for space with the oil palm plants in the long run.

6.3.4 Performance of the Contracting Firms

In order to avoid all the complications, the Department of Agriculture and the companies should conduct joint monitoring and census of oil palm trees should be done in the fields of the farmers by spot verification and new demand for the seedling for gap filling and fresh plantation should also be checked properly.

Farmers should be trained on the importance and correct use of agricultural inputs. The company or the department should run an agricultural store at least in a district headquarters or headquarters of Agricultural Circle to ensure that farmers were not devoid of important inputs. Trainings should not be taken lightly, not as a one-day programme, but as a continuous process in the form of visiting farms or exposure tour for farmers within or outside state to learn from the best performers.

6.3.5 Opportunity

With the implementation of the National Mission on Edible Oils- Oil Palm, with its special package for the North Eastern States, it is expected much of the problems previously faced by the farmers will be settled. Due to the difficult terrain in the region with high rainfall, there are lots of area-specific problems being faced. The Ministry may consider special package for the north eastern hill states for provision of agricultural link roads connecting the oil palm farms with all-weather roads, as earthen roads alone cannot cater the need as it could not be used during the monsoon season during which most of the FFBs were produced. Cluster approach have to be followed for achieving backward and forward linkages. Direct fund flow to the implementing department will also hasten the works and this will help in addressing the problems of the farmers in less time.

With implementation of the new price of the FFB and the adoption of the Central Price Formula, based on the International Crude Palm Oil price, many farmers are coming back with new zeal and vigour. The production of FFB is expected to increase considerably within few years-time. The cultivated area of Mamit and Kolasib put together as on July 2021 was 12,745 ha, taking an average productivity of 4 year-old plantations at 5 mt of FFB per ha per year, the total annual FFB production could be 63,725 mt, which will be beyond the capacity of palm oil mill established by Godrej Agrovet Ltd. Therefore, it is clear that addressing the problems being encountered by the farmers should be given priority before area expansion.

6.4 LIMITATIONS OF THE STUDY

The study present study is not free from limitations and some of them are highlighted in this section. There are no non-contract growers of oil palm in the state.

Therefore, productivity of the oil palm farmers in the state was compared with the productivity as per the chart provided by the Department of Agriculture, Government of Mizoram, which could show the existing gap in the present practice in the state. Detail information regarding the materials and services could not be provided by the department nor the companies. Therefore, the responses from the farmers are considered in this case. Lack of records by the farmers makes it difficult to get accurate data. However, the sale of FFB was recorded by most of the society at the village level while the equipment and services offered by the department or the company were not properly recorded. Many of the responses were given by them as per their memories. The study had been conducted in 2019 and due to the time lapsed, the present situation might have been changed.

In spite of the above and other limitations faced in this study, it is hoped that the research findings will give light on the status of contract farming in the state and is expected to provide a reference to the academicians and policy makers to follow the right track.

6.5 SCOPE FOR FURTHER RESEARCH

The following areas are suggested for further studies:

1. In order to throw more light on the development of oil palm plantation in the country in general and in Mizoram, in particular, it is suggested to study the environmental and ecological impact of oil palm cultivation. The study will help in application of better cultivation practices and will mitigate the adverse impact of the oil palm cultivation.
2. Scientific studies on oil palm cultivation practices in Mizoram to attain best management practices and to fill the yield gap is suggested.
3. An in-depth study on the present areas of cultivation by the agricultuaral experts with scientific inputs and clusterization of the plantations for achieving backward and forward linkages is an area, which need an urgent attention.

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