

RESEARCH REPORT



## OFC CULTIVATION IN THE NORTHERN PROVINCE: ISSUES AND POSSIBLE SOLUTIONS

R.L.N. JAYATHISSA



**HARTI**

Hector Kobbekaduwa  
Agrarian Research and  
Training Institute

# **OFC Cultivation in the Northern Province: Issues and Possible Solutions**

**R.L.N. Jayatissa**

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Hector Kobbekaduwa Agrarian Research and Training Institute  
114, Wijerama Mawatha, Colombo 07  
Sri Lanka

Final typesetting and lay-out by: Dilanthi Hewavitharana

Tel. Phone : +94112696981  
              : +94112696437

Fax : +94112692423

Email : [librarian@harti.gov.lk](mailto:librarian@harti.gov.lk)

Web page : [www.harti.gov.lk](http://www.harti.gov.lk)

## **FOREWORD**

The Northern province stands in a socially and economically unfavorable position mainly due to the war situation that engulfed the region for over three decades. Civil disturbances. That prevented for over three decades. GDP contribution of the province was 4.2% in 2016.

For the development of the province and upgrading the people's living condition a major and sustainable solution lies in the agriculture sector. Hence implementation of a comprehensive and robust programme to develop and enhance the OFC field with market orientation is desirable. Most suitable soil structures, weather conditions, potential scrub lands, underdeveloped home gardens, seasonal fallow lands under minor irrigation, the experienced farmer community are positive characteristics to achieve this end.

Nevertheless, an economy depending on imports on its essential food items continually has sparked a serious debate. Data shows great potential available to cultivate OFC locally while encouraging frugality.

Agro based industry can have vast potential in lagging behind in generating employment opportunities while adding a new strength to the local economy through value addition.

An extensive development programme to enhance the production of OFCs in the North is of pivotal significance specially in the face of vastly available potentials waiting to be tapped. The study makes an exploration into the available possibilities and stumbling blocks that would retard the implementation of a strategy to achieve self-sufficiency in these crops.

**M.C.P. Seneviratne**  
**Director-HARTI**

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**R.L.N. Jayatissa**

## EXECUTIVE SUMMARY

Apart from rice many other food items are essential to meet the food demands of the Sri Lankans. Towards this end other field crops (OFC) that constitute of coarse grains, grain legumes: (green gram, black gram, cowpea, soybean, and pigeon pea) condiments (Chile, big onion and red onion,) oil crops: (ground nut, sesame, and sunflower). All these crops are grown locally.

However, the country is still far short of self-sufficiency in these essential food items and large quantities are imported annually causing a heavy drain on foreign exchange. The Northern Province of Sri Lanka has a better environmental condition to cultivate all these the crops and those crops are cultivated there to some extent. Despite high the potentials in this province for an extensive OFC development strategy the civil disturbances which prevailed for over three decades curtailed such efforts being realized. The OFC subsector which has potential to be developed as commercial cash crops can also be an impetus to raise the living condition and the well-being of the people in the region.

The main objective of this study is identifying the prevailing issues in the OFC sector in the Northern Province and presenting viable solutions with policy implications. The specific objectives are identifying the debacles and investigating their degree of impact on national food production and recommending most suitable measures to resolve these issues and recommend appropriate policy recommendations. Methodology of the study focused on group discussions with the farmer community as well as the officials concerned the agriculture sector.

The other field crops cultivated in the province are black gram, green gram, maize, ground nut, cowpea, sesame, kurakkan, red onion, big onion and soya beans. In focus group interviews 127 OFC farmers from the Vavuniya district, 106 in the Kilinochchi district. 198 farmers in the Mulativu district. 119 farmers in the Mannar district. A number of OFC farmers and 64 farmers from the Jaffna district participated.

At focus group discussions a plethora of debacles came into sharper focus minor irrigation systems and dug wells have remained in a state of disrepair for a longer time rendering the cultivation of OFCs near impossible for scarcity of water, short supply of quality seeds, inaccessibility to farm machinery, spiraling cost of cultivation, inability to get fair prices for production in the season and difficulties to gain access to cultivable lands. The government policies on import of foods, paucity facility of agricultural officers for extension services, lack of infrastructural facilities and labour, pest, diseases and animal damage for also contributed to low productivity and low production.

The farmers suggested to increase the capacity of water in the tanks in the province under the Moragahakanda reservoir scheme. De silting and expanding the capacity of water in medium and minor tanks is another way out. Providing training to the farmers about maintaining and repairing the micro irrigation systems is also imperative. Resolving land

ownership rights and releasing the already cultivated chena lands and other lands controlled by defense forces were also proposed. By providing quality seeds the wide gap prevailing between the potential yield and the farmer yield can be minimized.

Further measures should to be taken to ensure the availability of larger quantities of high quality hybrid seeds. By addressing the issue of short supply in seedling machines and harvesting machines high cost of production, low farm income and lower living condition of the farm families can be resolved to an extent.

The need to introduce new farm machinery by the “Farm Machinery Unit” and a programme for supplying appropriate machinery to the OFC sector, along with technical knowledge to maintain them were also highlighted. The farmers pointed out the need to increase the number of Agriculture Instructors at field level, pay more attention to pest and diseases problems and increase farmer awareness this matter.

The imposition of import restrictions of OFC products close to the harvesting season, the organization of a purchasing programme with a minimum price with the assistance of farmer organizations, to have in place a storing mechanism and storage facilities were also vital suggestions. They also suggested training and other infrastructure and a sound environment to produce value added products.

The farmers need more capital investment to cultivate OFCs on a sustainable scale. The need for an easy farmer credit system at state banks and strengthening the farmer banks at each Agrarian Development Center level were noted.

Providing knowledge to minimize climate change related impacts on OFC and putting forth solutions to minimize animal damages to the OFCs and the youth wean away from OFC farming were also among the suggestions.

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## ABBREVIATION

ADC	-	Agrarian Development Centre
AI	-	Agriculture Instructor
EMT	-	Easy Method of Instalment
FMRC	-	Farm Machinery Research Centre
FMTC	-	Farm Machinery Training Centre
GDP	-	Gross Domestic Product
IPM	-	Integrated Pest Management
LHG	-	Low Humic Gley
NCRCS	-	New Comprehensive Rural Credit Scheme
NGO	-	Non Governmental Organization
OFC	-	Other Field Crops
RBE	-	Reddish Brown Earth
RDHS	-	Regional Director of Health Services

## **CHAPTER ONE**

### **Introduction**

#### **1.1 Background**

The domestic sector of agriculture plays an important role in the agricultural economy of Sri Lanka, in producing food and generating employment and income for the farmer population. Cultivation of paddy and other subsidiary crops mainly by the small farmers for domestic consumption is an outstanding feature in the local economy. The prominence of paddy cultivation across the country is mainly due to its importance in being the staple food of the people. Subsidiary food crops traditionally grown in Sri Lanka include kurakkan, sesame, Green gram, Black gram, maize, groundnut, red onion, big onion, chili, cowpea, and soybean. These are also grown primarily for consumption.

Availability of suitable fertile soil, favourable climatic conditions and cultivable land are the main reasons to select the Northern Province of Sri Lanka for this project.

Most of the subsidiary food crop production is concentrated in the dry zone. These crops are now cash crops generating employment opportunities and enhancing the agrarian socio – economic situation. Sri Lanka’s total requirement of OFCs is achieved partly by imports (40%) costing the country nearly Rs. 40,000 million in 2016.

In Sri Lanka non communicable diseases are on the rise mainly due to malnutrition; Sri Lankans have developed an increasing tendency to add more OFC products to their meals. The demands for OFC products have gone up but the production is not adequate to meet the rising demand necessitating the government to resort to imports. In such circumstances the government envisages to put in place a planned programme to escalate the production of OFCs in the Northern Province.

#### **1.2 The Research Problem**

The local production of the other field crops (OFC) falls far short of the consumer requirements in Sri Lanka. At present the production is, Maize 05%, big onions 42%, red onions 71%, dried chillies 15%, and Green gram 48% of the requirement. The expansion of population in the country invariably resulted in an upward demand for food items necessitating the import of OFCs annually at an expense of Rs. 28m in 2018. Socio – economic explorations have brought into light the persistent prevalence of child – malnutrition in rural areas and have recommended the dire necessity of complementing the daily meal with OFCs, the production of which needs to be given a strong thrust. The five districts in the Northern Province of Sri Lanka have potentials for extensive cultivation of OFCs – the soil, climate conditions and a sizeable segment of the responsive farming population having experience in growing OFCs. The 30 year old war and its attendant

disastrous effects forced the people to homes and seek solace in refugee centres and a good number of people, particularly the youths left the country in search of greener pastures. In spite of the cessation of the war and the physical development that followed; a plethora of issues have emerged in the field of agriculture. The displaced people and those who left the country are gradually returning. An indepth study to identify the barriers that check the development of the OFC cultivation can shed light on the implications that act as disincentives in an effort to awake this dormant sector. Such an exercise is of pivotal and urgent necessity. This study seeks to look for these factors and barriers.

### **1.3 Objective**

The main objective of the study is proposing suitable policy measures to develop the OFC sector in the Northern Province.

#### **Specific objectives:**

- To identify current issues and investigate to what extent they affect the OFC sector.
- To analyze the impact of socio-economic problems on farmer households, involved in OFC farming
- To look for the most suitable measures to overcome these problems prevailing in the study locations
- To make suggestions and recommendations to address the issues that emerge in the study, for future policy planning and formulation.

### **1.4 Research Methodology**

An indepth analysis was performed in respect of the prevalent impediments in the cultivation of different other field crops. The analysis covered the spheres of inputs, infrastructure, human resource, environment, irrigation and state intervention.

The study was based on primary data and secondary data, key informant interviews and case studies. Focus group discussions were conducted to extract information, directly from the stakeholders to facilitate the strengthening of data from other sources in the formal analysis. The key informants were agriculture sector Officers such as the Deputy Directors of the Department of Agriculture, the Agriculture Instructors, the Subject Matter Officers, the Deputy Commissioners and the officers of the Agrarian Development Department, the Farmer Leaders and purposely selected farmers. The focus group discussions with the OFC farmers and the officers were in the form of groups comprising eight to 10. All the major areas the farmers needed to be addressed to, came up for discussion.

Prominently featured in these encounters were land related problems such as availability, ownership and crops suitable for particular lands. Methods and costs of land preparation also came up for discussion. The participants focused attention on other relevant areas.

These discussions with the participation of the farmer representatives and the relevant officials provided a fine forum for an open dialogue about the core issues confronting the farmers and the responses of the officers.

- The discussions centered on a range of areas covering the key issues: seed and irrigation needs, requirements of quality seeds and availability of machinery for seeding, and irrigation and the present situation of tanks. The farmers observed their present usage of fertilizer, increasing costs of fertilizer and their knowledge and capabilities in the process of producing organic fertilizer, weed, pest and disease control, frequent pest attacks, preventive methods now in use, availability of tools along with harvest centered issues. Post-harvest management techniques, control of post-harvest damages and storing facilities were brought forth for discussion.
- Common problems that pressurize the farming community in rural Sri Lanka featured in the discussions – Finance and marketing, difficulties in finding capital for investment, indebtedness, inability to get loans, reimbursement of loans, unawareness of the insurance procedures, higher interest rates were the almost intractable issues the farmers were seriously concerned about.
- The researcher is of the view that what is indispensable here is formulating and operating a comprehensive information and training programme, particularly about the wide institutional network servicing the farmers. In addition to the two state banks, commercial banks and the recently introduced micro-credit schemes are a beneficial to the farming community provided the farmers are educated about the procedural implications of the workings of these institutes micro – credit network mainly run by private banks needs supervision with a regulatory mechanism to ensure that the poor farmers are not exploited.
- The subject of marketing touched upon the areas of available market facilities and the improvements needed: agents and commissions, marketing of value added products, demands and current market prices.
- Relationship between the farmers and the Department of Agriculture, activities of the AIs and the training provided by the Department and the farmers' links with the government officers were other subjects the discussions focused on.

## **1.5 Rationale for the Study**

Consumption requirement of the OFCs in the country is currently fulfilled with the local production complemented with imports. The heavy drain on foreign exchange and the dependence on foreign sources for food imports do not augur well for any country. It is left for the government to go all out to evolve needful strategies towards attaining self-sufficiency in the farming of OFCs.

- Facts and figures sourced from the national food production drive for 2018 create a bleak picture about the national production and the annual requirement of the OFCs in the country. Except for a couple of crops such as maize and sesame, the

production of all the other food crops failed far short of the national requirement which was 235,000mt in 2018 whereas the production was only 150,000mt.

The potentials available in the Northern region untapped need to be explored for the furtherance of the OFC cultivation which could have favourable effects on the drain of foreign exchange for fulfillment of country's requirement, creation of employment opportunities and enhancing the income of the farmer population in the region.

A study conducted by the HARTI (2014) revealed the kind of malnutrition percentages in the country; stunting 21.9%, wasting 12.9%, and underweight 21.3%. The study recommends some positive measures to mitigate this unfavourable nutritional status. Expanding the cultivation extent to increase the production of OFCs which are nutritionally rich commodities such as pulses and legumes is one way out of the problem. At present OFCs are cultivated on more than 30,000 (ha) in the Northern Province. Socio-economic research has not been conducted during the last thirty years covering the OFC sector and as a result the issues of the have not been clearly understood.

Following the period of civil disturbances in the country, particularly in the North the government of Sri Lanka channeled a large sum of capital for the revival of the rural agricultural economy of the Northern region. As a result, a tangible improvement of the crop sector in the Province was observed in the recent past. However, there are enormous deficiencies in the scenario owing to various socio-economic and political implications. It is of utmost importance to comprehend the key factors affecting the failure of the huge investment and what are the key issues of the present agricultural development in the province. In another way the food production system of the Province needs to be explored whether it is on the correct path. This study focuses directly on the other field crop cultivation sector, (OFC) in the North of Sri Lanka.

The researcher had a dialogue with the officers of the agricultural and the agrarian sector and selected experienced and knowledgeable farmers for the sample to have their opinions and suggestions towards the furtherance of this sector removing the barriers that impede them now.

## CHAPTER TWO

### Review of Literature

#### 2.1 Introduction

This report is based on the study (Wickramasinghe, 2013) on “Change in other field crops cultivation in the “North Western Province” which provides a basic idea about Sri Lanka’s current situation about the OFC cultivation and the barriers faced by the farmers in the North Western Province. Other Field Crops (OFC) production in the country has been on the decline after mid 80’ s and this trend continued the dependency on imports to meet the national requirement of these commodities at an increasing rate. Economic factors, market prices and trade policies and liberalization of the economy have been important determinants in the expansion of the OFC cultivation in the country. The government’s restrictions on the chena cultivation are a disincentive. To overcome these problems of the OFC sector, still predominantly a semi – subsistence family labour dependent farming system in the province, planned efforts are imperative, both short term and long term, but a few farming systems have evolved as a sub commercial system based on market signals. Less input and less labour demanding innovative farming methods are still needed to be developed for the welfare of the dry zone farmers. Genetic improvement of local varieties with resistance to local conditions is also vital.

In addition, water security through micro irrigation methods and tank rehabilitation could assure OFC farming during the *Yala* season. Extension services, promotional programmes, contractual agreements on marketing and school nutrition programmes linked to the production programmes are important to promote the cultivation of the OFCs. Research on innovative farming systems need to be set in motion that takes productivity, labour saving and sustainability into consideration. Research is also needed to explore the feasibility of mechanized large scale commercial farming of the OFCs and the required institutional set up in the dry zone.

The government aims at achieving self-sufficiency in the OFC sector. But influenced by one major factor 42% of the annual requirement of the country is still imported. This requires an increase in the supply of the OFC to be achieved in terms of both production and productivity. The OFC farming pursued on a small scale, and the increased use of family and exchange labour where mechanization is limited with most activities depending on manual labour. So a prerequisite to increase the farm output is to improve labour productivity through access to equipment and machinery for carrying out farm operations. The study (Sharmini, K., 2016) aims at investigating the causality behind poor level of mechanization in the OFC production from both supply and demand, perspectives in two districts of Ampara and Moneragala. From the study, one can garner certain facts with regard to the constraints in mechanization from the supply and demand angle. From the supply side is the unavailability of farm machinery to suit the local farm environment

coupled with attitudes of farming community in the use of technology; with regard to the demand, the constraint lies in the incompatibility of machines to suit the local farm environment.

Other factors such as low awareness among the farmers about the availability of machinery and non-affordability due to high cost and poor farmer income have aggravated the issue. State policy decisions are of crucial importance about farmer level adoptive research, high tech efficient machines, improving the staff strength, tax concessions and to import machinery so that farmers can be motivated to use technology. The assistance of the engineering and agricultural faculties of higher institutes of education can be solicited to introduce the farmers to innovations with farm machinery.

Even though the farmers are aware of the advantages associated with farm machinery they are unable to gain access to them for various of reasons. The main advantages include improvement of quality and quantity of the product, timeliness, reduction of drudgery, bringing down the production cost and low labour requirement. A number of limiting factors deprive the farmers of owning the machines. Poor purchasing power, seasonal usage of machinery, difficulty in obtaining financial facilities to hire or purchase machinery, the need for multi-purpose machines, lack of after – sales services are prominent impediments.

Hiring of machinery by farmers is also rare due to following reasons:

- Non availability of machinery in close proximity to the farms
- Lack of awareness on available technology
- High and varying hiring charges
- Reluctance of some machine owners to hire their machinery
- Insufficient machinery to cater the demand
- Financial hardships during peak periods
- Incapacity to get the expected quality of service

At present the supply of machinery and distribution system is mostly handled by the private sector. And there are no sufficiently organized after – sales services, and the farmers have no easy access to spare parts etc. Further, there are instances where machines of substandard quality have been offered to the farmer. Some remedial measures with government intervention can be provided. The farmers need:

- quality assured machinery
- easy payment facilities
- better after – sales facilities
- awareness programmes on the available technology with the help of respective agencies
- ensure the availability of repair facilities within the area

Strong linkages with the Farm Mechanization Research Center (FMRC) and the Farm Mechanization Training Center (FMTC) are imperative. The government controlled tractor hiring unit failed and was compelled to close down due to inefficient management and poor maintenance of the machinery. Therefore, it is suggested to establish government controlled machinery hiring units island wide for the farmers to hire the machines through farmer organizations, (Thilakaratne, 2005).

The study of "Human – Elephant Conflict and Solutions to it in Sri Lanka" (Dharmaratne, 2014) affirms that one of the major causes of human wildlife conflict is competition for space. Destruction of forests by man through logging, encroachment, slash - and – burn shifting cultivation, and monoculture tree plantations have turned the issue to worse. The elephants' habitats are depleted and they invade the villages bordering the forests. In this context three different challenges arise.

i Direct cost (crop damage, human deaths, and injury)

This cost directly affects the humans and wild animals, Elephants in large herds can destroy large areas of crops in a single night and they are a deadly threat to the people. During the period from 1999 to the end of 2006, every year nearly 100 wild elephants were killed in Sri Lanka.

ii Indirect cost

The time the farmers have to spend for protecting crops and property compromises family security and accounts for indirect costs. (eg. there may be a drop in attendance at schools).

iii Opportunity cost

Opportunity cost of different conflict management approaches can be calculated by the foregone income of the farmer household because of their commitment to fight the conflict (Thirgood, Woodroffe Rabinowits, 2005). It can be presented as a percentage loss of annual income.

In this respect the government and the non-government organizations can play a co-ordinated and positive role to ensure that implications of the problem are brought to a minimum. Electric fencing, creating awareness among the farmers about behavioral pattern of elephants and habitat enrichment and planting fodder trees in the elephant habitats are some measures that can be adopted (Dharmaratne, 2014).

The Central Bank of Sri Lanka introduced a New Comprehensive Rural Credit Scheme (NCRCS) SARUSARA especially for agricultural purposes and the farmers are able to get

loan facilities to a maximum limit of Rs. 500,000 per farmer for seed farming, nurseries and planting material.

According to the study 'cost of cultivation of agricultural crop *Maha /Yala* season cost of cultivation is the main problem for the farmer; year by year it surveys because of increasing labour wages and input prices.

Central Bank of Sri Lanka focuses on the following methods to improve the OFC cultivation.

- introducing new postharvest technology
- developing storage facilities
- introducing off seasonal cultivation and encouraging crop diversification

The study by Dharmaratne, (2014) "An Overall Assessment of the Agricultural Marketing Systems in Northern Province of Sri Lanka" has identified following weaknesses of current production system of the paddy sector and the other field crops sector in the region

- Irrational land use pattern in the region
- Faulty water management as most of the irrigation infrastructure of both down and up streams are either in a damaged or dilapidated condition
- Prevalence of scattered cultivation due to poor socio-economic condition
- Shortage of labour
- No competitive production and organized marketing system.
- Unavailability of an efficient marketing network.
- Low popularity of rice based products.
- Inadequate storage facilities and application of poor processing and milling technology.
- Poor input accessibility and affordability. Poor and ineffective supply of quality seeds.
- Lack of technological know-how in the rural society.
- Inadequate availability of new high yielding varieties.
- Inadequate knowledge on new technologies at village level.
- Low productivity due to rain fed cultivation. Ineffective crop management.
- High incidence of pests and diseases.
- Lack of farmer group activities.
- Lack of private investment in processing and agro-based industries.
- No regulatory market arrangement for raw and value added products.

As concluding remarks, he adds that the long time war situation and the conflict severely damaged the prevailed agricultural infrastructure in the province. Successive governments which came to power changed the policies of agriculture, opened the economy and let the free import of agricultural food commodities. It severely affected the Jaffna farmers. In addition, the market value chain, neglected for a long time, collapsed. After the war the governments took measures to uplift the socio-economic conditions of the Northern people and introduced new measures to restore livelihood and infrastructure. The government made massive investments with the assistance of international donors. Currently the economic and social situation of the Province is gradually changing to the better and agriculture has come to the forefront of the economy. Paddy, red onion, green chili, potatoes, pulses, tobacco, dairy products, palmyrah products, and animal products are the major agricultural commodities. Fruits like banana, grapes, mangoes and vegetables are more popular among the farmers as main commercial crops. Except red onion, banana, and grapes the other agricultural products are not in much demand for consumption requirements of the province. Eg: The total production of paddy was 82% of the consumption requirement of the Province while pulses and vegetables accounted for only 40% and 60% respectively. There is a large untapped unmarketed potential for the development of key agricultural crops of the region.

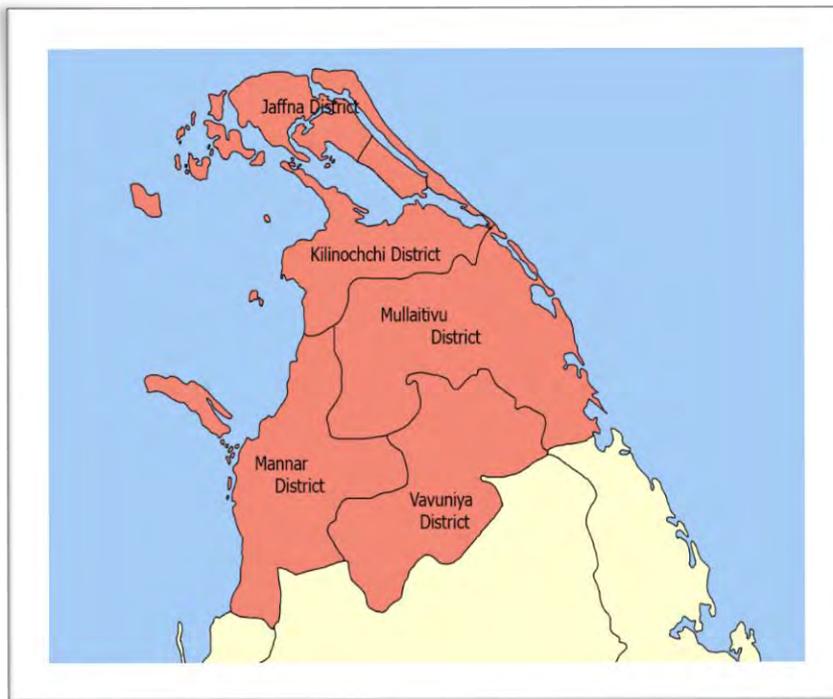


## CHAPTER THREE

### Situation Analysis

#### 3.1 Overview of the Northern Province

The Northern Province embraces five districts namely, Jaffna, Killinochchi, Mannar, Mullaitivu and Vavuniya. The Province covering an area of 8,848.21 sq.km accounts for around 13.22% of the total land area of the island. This region has a forest cover of 1,981.30 sq. km. and the inland water area covers 302.9 sq.km.



**Figure 3.1: Northern Province**

The land of the region is relatively flat and of low elevation towards the coast. Six major soil groups have been identified in the region. The dominant is Reddish Brown Earth (RBE). The association of Low Humic Gley (LHG) with RBE soil (92%) is well suited for paddy cultivation. Red yellow laterite, non-calcic brown soil and grumusol exist in Killinochchi, Jaffna and Mannar areas respectively. The RBE has low organic matter content and the Nitrogen and Phosphorus status is usually low while Potassium status varies from medium to low. These soils are very well supplied in Calcium and Magnesium, and they have a very good cation exchange capacity. By tropical standards, these soils could be considered as having a very good chemical quality. The other soil types are alluvial of variable drainage

and texture (4%), rock knob plain (2%), erosion remnants (1%) and solodized solonets and solonchaks (1%).

Sri Lanka enjoys a typical tropical monsoonal climate. The Northern Province tends to be hot and dry in the dry season (February to September), and moderately cool and wet in the wet season (October to January). The province's climate is of the tropical kind and therefore during monsoons there is always the chance of a deluge. In the lowlands the climate is typically tropical with the average temperature around 28° to 30° for the year. However, on the whole, January is the coolest month and May is the hottest month. Relative humidity varies from 70% during the day to 90% at night. The dry zone of Sri Lanka is the North and East of the island; this region is affected by the North East Monsoon (December to March) and Southwest Monsoon (June to October). It is thought to be dry because most of the rain fall during the North-east monsoon. Annual rainfall is less than 1250 mm in the North west and South East of the Inland. It has two rainy seasons: South West Monsoon- May to August, and North east monsoon November to February.

Irrigation sector is inter related with agriculture and inland fishing. Therefore, hundreds and thousands of people in the Province are dependent on irrigation for their livelihood activities. Forty-five medium irrigation schemes and nine major irrigation schemes come under the provincial irrigation sector. In addition, there are three major tanks under the central administration. There are 2,661 tanks and ponds also under minor irrigation. Nearly 74,081 acres had irrigation facilities in 2014.

The Northern Province is predominantly an agricultural region having crops, livestock and fisheries as pivotal sub sectors. Reflecting the rapid expansion in income generation activities in the province, the GDP growth rate was the highest in the Province at 25.9 % in 2012 and its share of 4% to the national GDP shows an improvement when compared to 3.7% recorded in 2011. The structure of the provincial economy has not changed over the period. However, agriculture, including fisheries and animal husbandry which form the mainstay of the economy have shown a positive growth after 2009. Therefore, the agricultural sector contributed 19.6% of the GDP composition to the provincial economy in 2012. The growth rate reached a slightly positive improvement resulting in a per capita income of Rs. 288,000 in 2012 whereas it was Rs. 202,000 in 2011.

Agriculture is the dominant productive sector in the Northern Province. The rapid development of this sector in the Province resulted in a paddy harvest of 100,764mt in 2014 and was able to supply its surplus to other parts of the country. Further, 30,335 ha of highlands were brought under annual crops, perennial crops and homesteads cultivation in 2014.

The Northern Province does not have a single perennial river, but has very limited seasonal streams and water sources. Traditional water storage is through built irrigation tanks. Prior to the ethnic conflict it indicated that intensive agriculture, especially paddy,

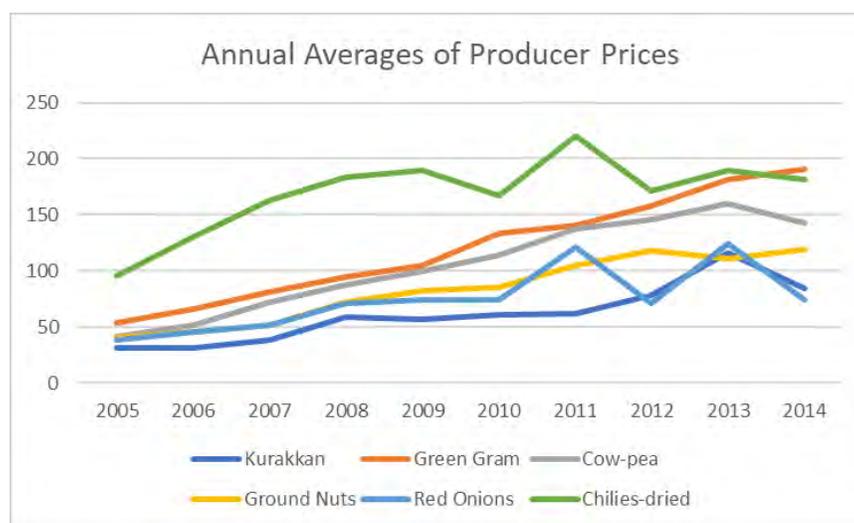
could not be supported without adequate replenishment of surface water storage. Water scarcity is a main constraint in many parts of the province, even for drinking and domestic use. The major tank cascade systems and existing major irrigation schemes (Iranamadu, Giant’s Tank, Pavakkulam, Kalmadu) should be closely examined to determine the productive capacity of agriculture and irrigation, plus quality of drinking water available in the Northern districts.

**Table 3.1: Annual Averages of Producer Prices for Selected Agricultural Products**

**(Rs.Cts)**

ITEM	Unit	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Kurakkan	Kg	31	31	39	59	57	61	62	78	116	85
Green gram	Kg	54	66	81	95	105	134	141	158	182	191
Cow-pea	Kg	42	52	72	88	100	114	138	146	160	143
Groundnuts	Kg	41	46	52	72	82	86	105	118	111	119
Red onions	Kg	39	46	52	71	74	74	121	71	124	74
Chilies-dried	Kg	96	131	163	184	190	167	220	171	190	182

Source: Department of Census and Statistics



Source: Department of Census and Statistics

**Figure 3.2: Annual Average of Producer Prices**

The Table 3.1 and Figure 3.2 show the average producer prices for some OFC products from 2005 to 2014. According to the table OFC producer prices had increased but in the

last ten years the cost of production per kilogram marked an upward trend due to following reasons.

- increased cost for labour
- increased input cost other than labour (seed price, fertilizer cost, machine oil, rent for land and machinery, increasing trend of interest rate for loans)
- reduced yields non-use of new methods, climate change, pest and disease challenges
- unexpected losses (in harvesting, transporting, and storing)

Table 3.2 presents the information of the total cost of selected OFCs. Accordingly, total cost including interrupted cost and excluding interrupted cost in respect of each crop are tabulated below.

**Table 3.2: Total Cost for Selected OFC in 2013/14 Maha Season**

Description	Maize	Black gram	Green gram	Chili	Gingerly	Red onion	Cowpea	Ground nut
Total cost(including interrupted cost)	Rs 45,814.00	RS 28,276.00	Rs 39,653.00	Rs 117,926.00	Rs 29,668.00	RS 239,305.00	Rs 38,731.00	Rs 50,381.00
Total cost(excluding interrupted cost)	Rs 29,011.00	Rs 19,374.00	Rs 31,772.00	RS 50,116.00	Rs 16,480.00	Rs 203,876.00	Rs 24,666.00	Rs 32,749.00
Yield(Acre)	1885Kg	349Kg	326Kg	2488Kg	333Kg	5217Kg	294	574Kg
Price (Rs)	Rs 31.70	Rs 163.00	Rs 217.00	Rs 102.00	Rs 254.00	Rs 63.75	Rs 164.00	Rs118.00
Revenue	Rs 59,755.00	Rs 56,887.00	Rs 70,742.00	Rs 253,776.00	Rs 84,582.00	Rs 332,583.75	Rs 48,216.00	Rs 67,732.00

Source: Cost of Cultivation of Agriculture Crop - Department of Agriculture, 2015

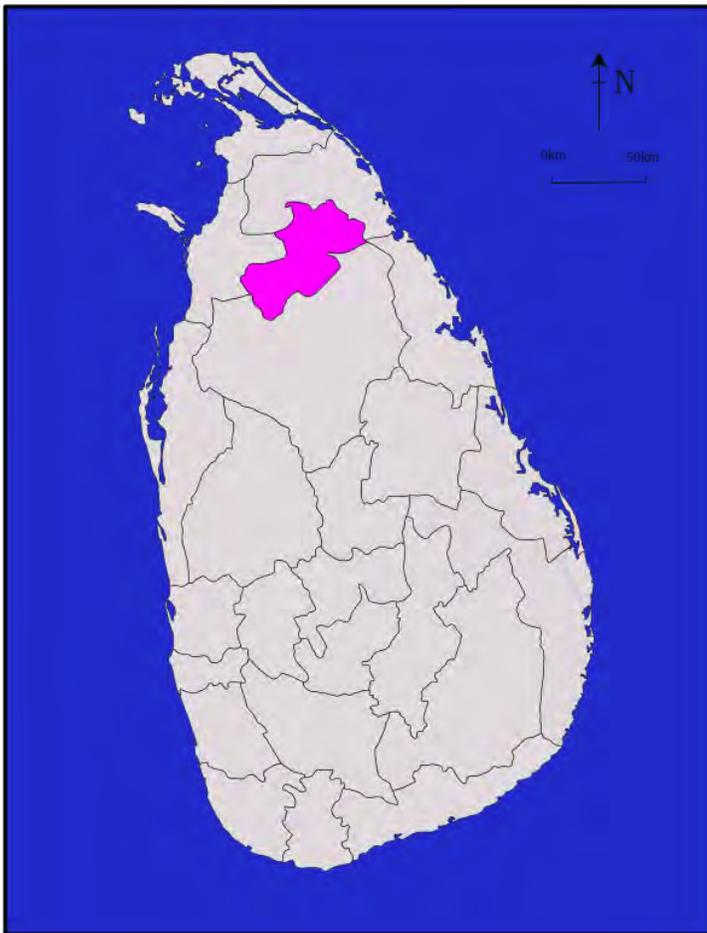
## CHAPTER FOUR

### Research and Discussion

#### 4.1 Vavuniya District

##### 4.1.1 Analysis of the OFC Sector: Vavuniya District

District of Vavuniya belongs to the Northern Province and Sinhalese, Tamils and Muslims are the communities that populate the district. The population of the district on 2015.12.31 as per reports from the Divisional Secretaries was 189,402, members of 54,277 families. And one of the specialties of the district is that the villages are named after the tanks. Many tanks had been constructed during the period of ancient Nagas by



damming the rivers. The tanks had been constructed in the plains to store the water flowing in rainy seasons from the hill country. It is stated in history that this region was divided into fields and farms. (Annual Performance Report, District Secretariat of Vavuniya - 2015)

Food crops other than rice primarily constitute the subsidiary food crop sector in Sri Lanka. They are other field crops (OFCs) and vegetables cultivated on highland in both seasons and on the lowland in the dry season. Crops such as chilli, red onion, big onion, Black gram, Green gram, maize, groundnut, sesame, kurakkan, cowpea, soyabeans are cultivated.

**Figure 4.1: Vavuniya District**

In this report the current situation regarding the OFC cultivation in Vavuniya is reviewed. The extent of cultivation of the OFC in the district in 2015 was 1059.86 ha., yielding a harvest of 3799.51 mt. However, according to the farmers 'view the production of other field crops dropped due to damages caused by heavy rain and floods in early 2015.

The district has eight Agrarian Development Centres: Ulukkulam, Madukantha, Kanakarayankulam, Nedunkeny, Cheddikulam, Omanthai, Pampaimadu and Kovilkulam.

Data on extents of land under OFC in the *Maha* season 2015/16 and the *Yala* season 2016 in Vavuniya district are presented in Table 4.1. It is evident that all the other field crops excluding big onion can be farmed in both seasons except for the limitations imposed in the *Yala* season for want of water. Addressing the issue of scarcity of water and other related impediments can pave the way to increase the extent of cultivation of OFCs.

**Table 4.1: Extent of Other Field Crop Cultivated during *Maha* 2015/16 and *Yala* Season in 2016**

<b>Crop</b>	<b><i>Maha</i> (ha)</b>	<b><i>Yala</i> (ha)</b>
Black gram	6500	24
Green gram	400	56
Cowpea	600	100
Chilli	300	200
Red onion	66	350
Big onion	0	63
Sesame	282	24
Maize	408	42
Groundnut	400	589

Source: - Other Field Crop Cultivation (2015/16)- Ministry of Agriculture

#### **4.2 Major Crops and Tank Details in Vavuniya**

Table 4. 2 describes the number of tanks available in each agrarian services command area and, main other field crops (OFC) cultivation. Table also indicates the situation of the water, the farmers depend on. The district has 674 tanks of which 273 need improvements to overcome this constraint to a certain extent and 105 damaged tanks have to be completely overhauled.

**Table 4.2: Major Crops and Tank Details in Vavuniya - 2012**

Name of AKN(Agrarian Service Center)	No of Tanks			Total	Main Crop Cultivation in this Area (Priority order)
	Working	Need Improvement	Breached		
Kovilkulam	51	26	8	85	Black gram, cowpea, red onion, maize, groundnut
Pampaimadu	69	47	17	133	Black gram , chilli, groundnut
Omanthai	18	73	15	106	Groundnut, Black gram, chilli
Cheddikulam	110	14	13	137	Black gram, cowpea, green gram, groundnut
Nedunkeny	23	25	12	60	Black gram, chilli, red onion, groundnut
Kanakarayankulam	21	15	23	59	Groundnut , black gram, chilli, groundnut
Madukantha	52	5	6	63	Black gram, maize, green gram and cowpea
Ulukkulam	17	3	11	31	Maize, Black gram, green gram and cowpea

Source: Annual Performance Report, District Secretariat of Vavuniya-2012

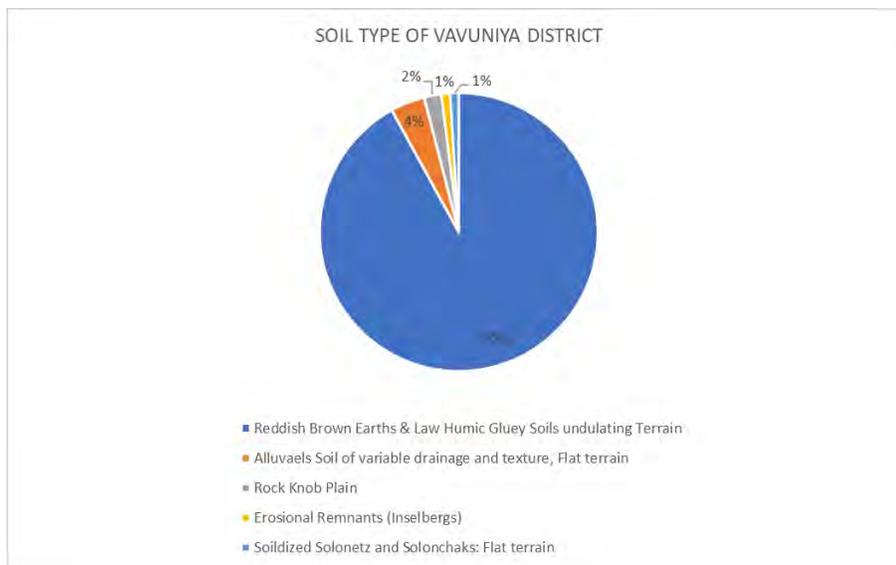
### 4.3 Soil Type of Vavuniya District (Estimated)

Table 4.3 shows the main type of soil in the Vavuniya district and their suitability for crop cultivation. Most of the soil types are (96%) suitable for cultivation.

**Table 4.3: Soil Type of Vavuniya District**

No	Soil Type	Percentage	Suitable Crop
1 2	Reddish brown earths & law humic gluey soils undulating terrain	92%	Rice, onions, groundnut, sugarcane, sunflower, cotton, timber tree, chilli, Black gram, Green gram
3	Alluvaels soil of variable drainage and texture, flat terrain	4%	Rice, maize, groundnut, sugarcane, sunflower, cotton
4	Rock knob plain	2%	-
5	Erosional remnants (Inselbergs)	1%	-
6	Soildized solonetz and solonchaks : flat terrain	1%	-
	<b>Total</b>	<b>100%</b>	

Source: Annual Performance Report, District Secretariat of Vavuniya-2015



Source: Annual Performance Report – District Secretariat of Vavuniya

**Figure 4.2: Soil Type of Vavuniya District**

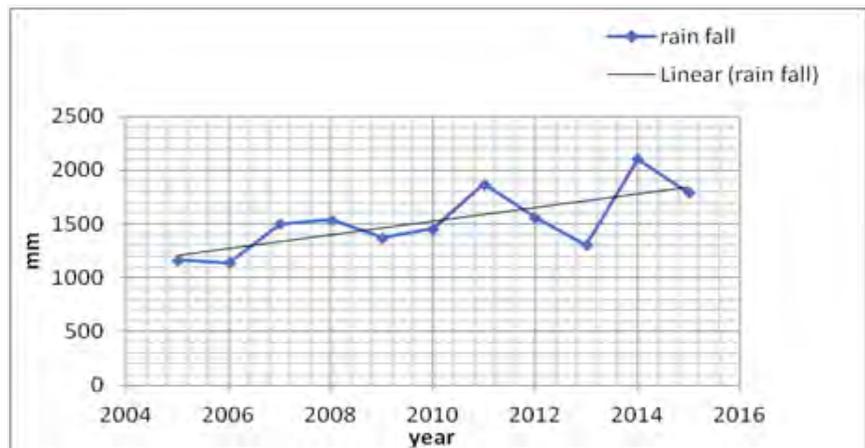
The Table no. 4.3 shows the main type of soil in the district and its suitability for crop cultivation. Out of the total 92% is Reddish Brown Earths and Law Humic Gluey Soils. That soil type is suitable for crops such as rice, onions, groundnut, sugarcane, sunflower, cotton, timber tree, chilli, Black gram, Green gram. Four percent is Alluvial soil of variable drainage and texture which is suitable for rice, maize, groundnut, sugarcane, sunflower, cotton.

#### 4.4 Annual Rainfall during the Last 10 Years 2005-2015 (in mm)

Table 4.4 shows the rain fall pattern during the last ten years in the district. Figure 4.3 shows that the rain fall has upped every year.

**Table 4.4: Annual Rainfall during the Last 10 Years 2005-2015 (in mm)**

Year	Annual Rainfall mm
2005	1167.2
2006	1137.9
2007	1504.3
2008	1538.9
2009	1373.7
2010	1456.6
2011	1869.2
2012	1559.3
2013	1304.5
2014	2106
2015	1795.1



Source: Annual Performance Report, District Secretariat of Vavuniya-2015

**Figure 4.3: Rainfall Pattern (2005-2015)**

#### 4.5 Crop wise Extent of OFC Cultivation in Vavuniya

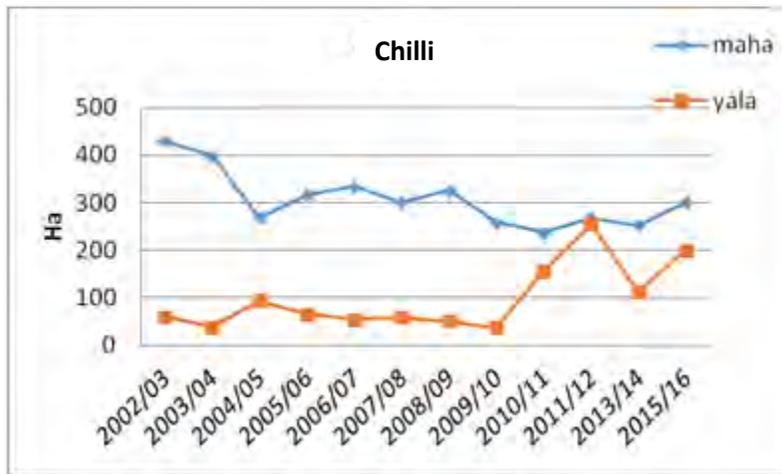
Tables below and the graph record the crop wise extent of OFC cultivation, which reflect that the maximum extent has not been farmed in both seasons every year. This situation compels to look for reasons as to why this has happened and what remedial measures should be taken.

#### 4.5.1 Chilli Cultivation

**Table 4.5: Cultivation Extent of Chilli (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2002/2003	429.75	60.5
2003/2004	398.5	38.5
2004/2005	268.5	94.25
2005/2006	316.75	65.5
2006/2007	334	55.2
2007/2008	300.5	59
2008/2009	326.3	50.65
2009/2010	259	38
2010/2011	238	157.5
2011/2012	268	255
2013/2014	252	113
2015/2016	300	200

Source:-Department of Census and Statistics



Cultivation season – Year/Maha

**Figure 4.4: Chilli Cultivation in Vavuniya District**

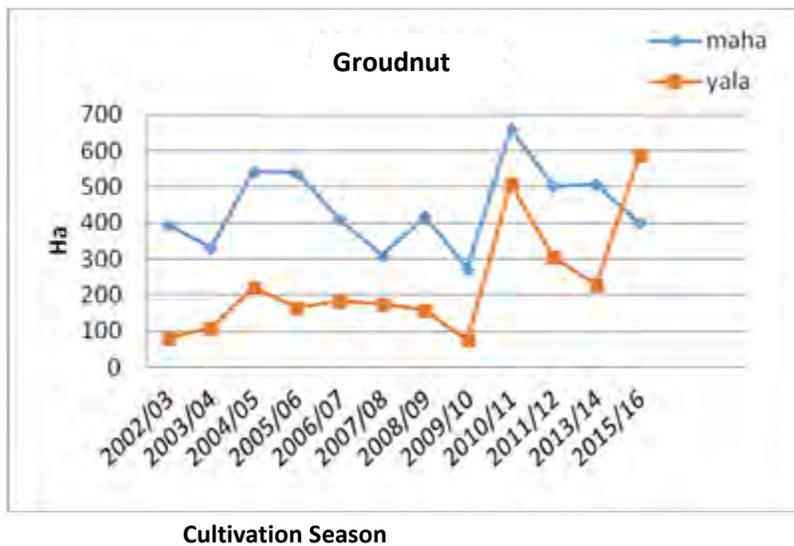
The above graph shows an increasing trend in the chilli cultivation during the *Yala* seasons of the last four years. But in the *Maha* season it was the reverse.

#### 4.5.2 Groundnut Cultivation

**Table 4.6: Cultivation Extent of groundnut (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2002/2003	395	79.5
2003/2004	331.5	108.75
2004/2005	543	222.25
2005/2006	539	164.15
2006/2007	410	183
2007/2008	309.5	176.3
2008/2009	417.95	158.65
2009/2010	273.75	74.6
2010/2011	662	507
2011/2012	502	304
2013/2014	507	229
2015/2016	400	589

Source: Department of Census and Statistics



**Figure 4.5: Groundnut Cultivation in Vavuniya District**

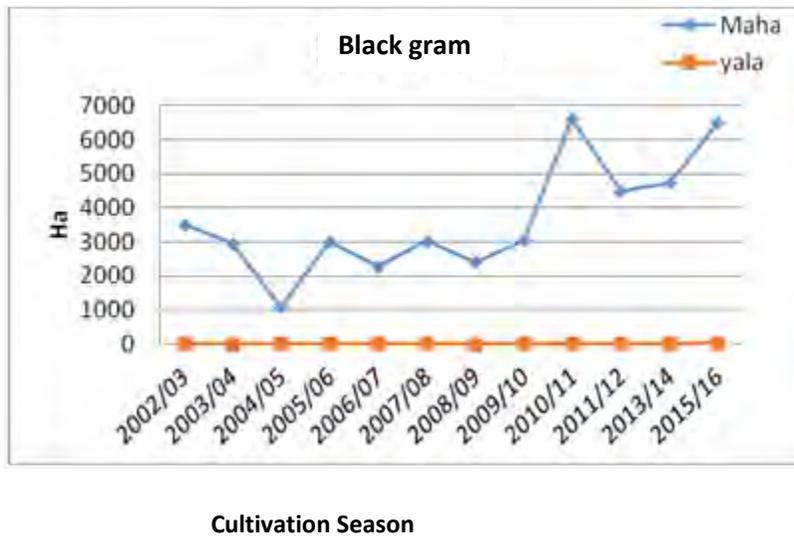
Figure above shows the fluctuation of the groundnut cultivation during the last ten years in the *Yala* and *Maha* seasons. Even though the cultivation in the *Maha* season is higher than that of the *Yala* season, in the year of 2015/16 it can be seen that groundnut cultivation in the *Yala* season has increased and it is even more than that of the *Maha* season of the same year.

### 4.5.3 Black gram Cultivation

**Table 4.7: Cultivation Extent of Black gram (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2002/2003	3513	2.5
2003/2004	2955	0
2004/2005	1084	7.5
2005/2006	3013	11.6
2006/2007	2273	16.9
2007/2008	3034	3.25
2008/2009	2401	1.75
2009/2010	3037	3
2010/2011	6600	15
2011/2012	4493	8
2013/2014	4736	3
2015/2016	6500	24

Source: Department of Census and Statistics



**Figure 4.6: Black gram Cultivation in Vavuniya District**

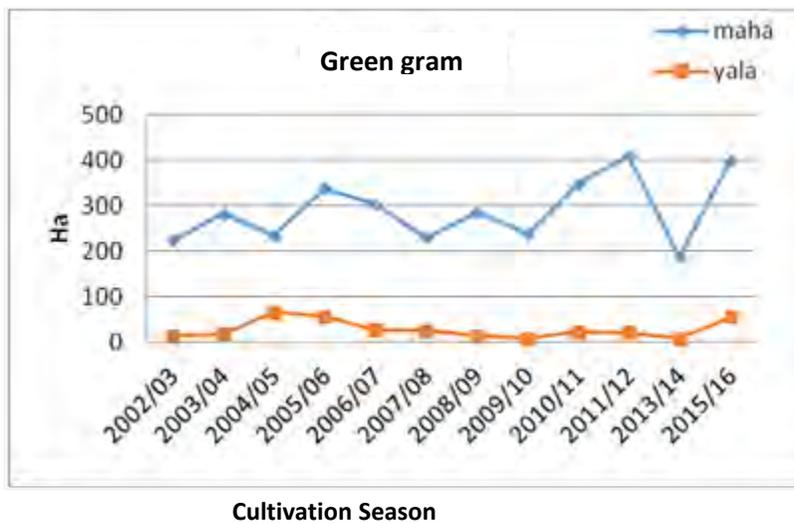
The graphic presentation of the Black gram cultivation marks the increasing trends in the *Maha* seasons of the last nine years and how it fluctuated in the *Yala* seasons.

#### 4.5.4 Green gram Cultivation

**Table 4.8: Cultivation Extent of Green gram (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2002/2003	224.5	15.25
2003/2004	283.5	19.5
2004/2005	234.5	66.85
2005/2006	338.5	57.42
2006/2007	305	27.75
2007/2008	230	27
2008/2009	285.7	15.25
2009/2010	238.5	9.35
2010/2011	349	23
2011/2012	411	22
2013/2014	187	9
2015/2016	400	56

Source: Department of Census and Statistics



**Figure 4.7: Green gram Cultivation in Vavuniya District**

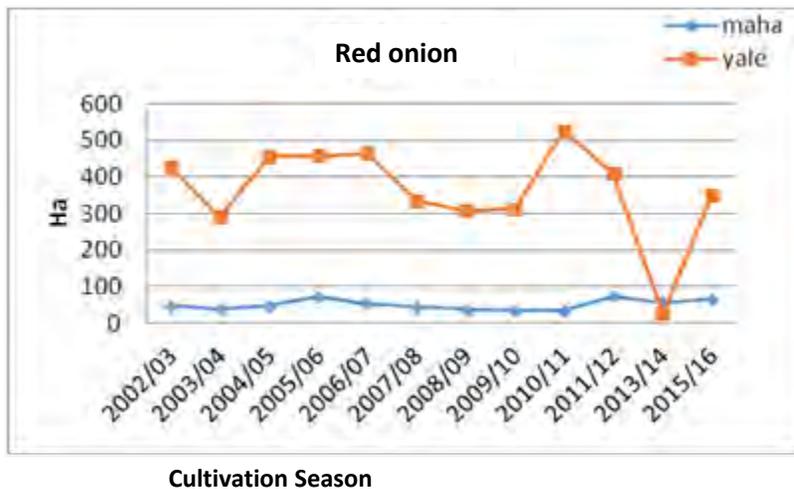
The graphs above shows that Green gram cultivation has been fluctuating during the last ten years in the *Maha* season but during the last seven years (2006/2007 to 2013/2014) in the *Yala* season it has recorded a slow downturn.

#### 4.5.5 Red onion Cultivation (ha)

**Table 4.9: Cultivation Extent of Red onion (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2002/2003	48.5	426.5
2003/2004	39.6	290.5
2004/2005	49	456
2005/2006	72.25	458.5
2006/2007	53.5	464.5
2007/2008	45	334.3
2008/2009	38.7	307.7
2009/2010	34	314
2010/2011	34	526
2011/2012	75	409
2013/2014	57	26
2015/2016	66	350

Source: Department of Census and Statistics



**Figure 4.8: Red Onion Cultivation in Vavuniya District**

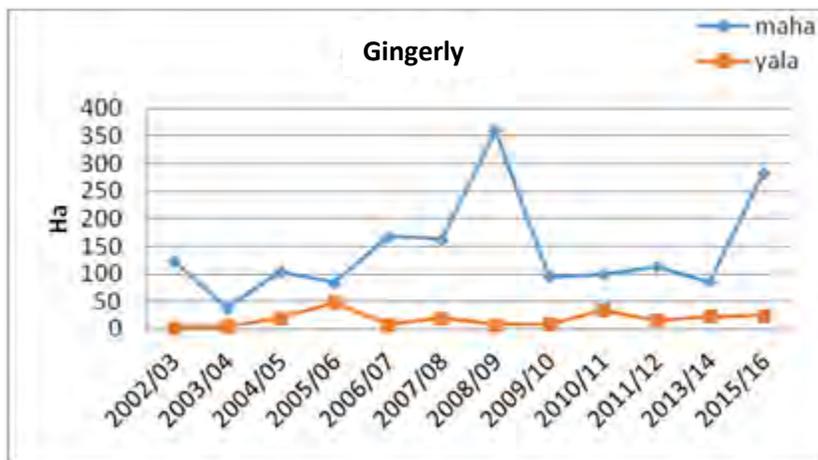
During the 2013/14 *Yala* season red onion cultivation had come down unlike in other years. The cultivation fluctuated during the *Maha* seasons in the last five years (2008/2009 to 2013/2014). In some seasons the fluctuations were staggering.

#### 4.5.6 Gingerly Cultivation

**Table 4.10: Cultivation Extent of Gingerly (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2002/2003	123.7	3.5
2003/2004	38	4.5
2004/2005	104	20
2005/2006	84.5	49.25
2006/2007	168	8.75
2007/2008	163.5	20
2008/2009	361	8.3
2009/2010	95.5	10
2010/2011	100	35
2011/2012	114	16.5
2013/2014	86	23
2015/2016	282	24

Source: Department of Census and Statistics



Cultivation Season

**Figure 4.9: Gingerly Cultivation in Vavuniya District**

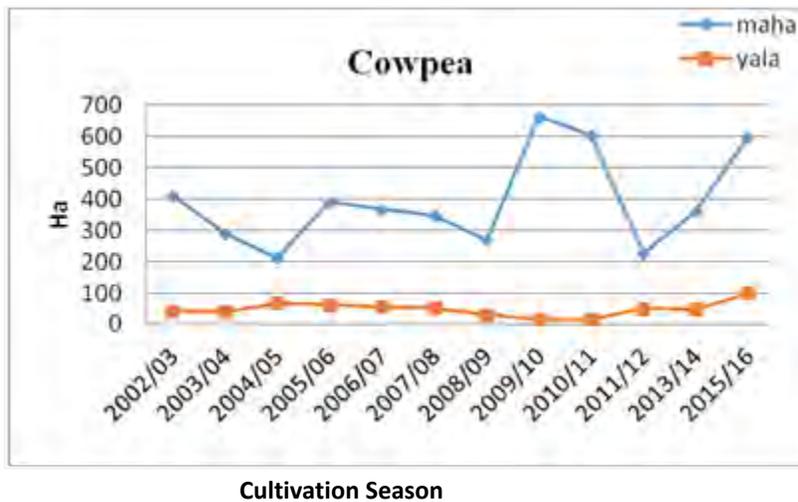
During the last 12 years' the extent of gingerly cultivation has fluctuated. But in (2015/2016) the *Maha* season extent of cultivation recorded an increase.

#### 4.5.7 Cowpea Cultivation

**Table 4.11: Cultivation extent of Cowpea (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2002/2003	412.5	42
2003/2004	292	39.5
2004/2005	213.5	67.75
2005/2006	391.5	63.23
2006/2007	367	56.35
2007/2008	347	51.75
2008/2009	270	29.95
2009/2010	664	17
2010/2011	604	16
2011/2012	228	50
2013/2014	362	49
2015/2016	600	100

Source: Department of Census and Statistics



**Figure 4.10: Cowpea Cultivation in Vavuniya District**

The extent of cowpea cultivation was fluctuating during the last 12 years, but in (2013/2014, 2015/2016) the *Maha* and the *Yala* seasons observed an increasing trend.

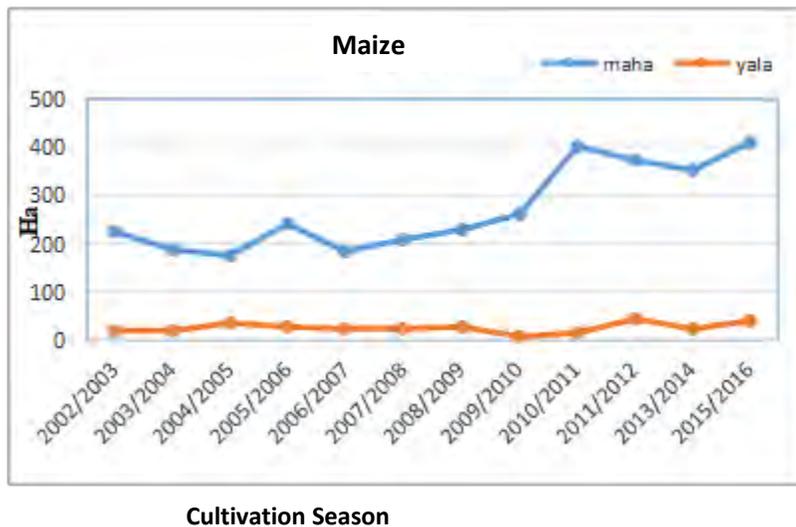
#### 4.5.8 Maize Cultivation

**Table 4.12: Cultivation Extent of Maize (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2002/2003	224.5	18.5
2003/2004	186	18.75
2004/2005	174.5	38
2005/2006	240	28.5
2006/2007	185	22
2007/2008	210	22.25
2008/2009	227.2	27.85
2009/2010	261.3	6.5
2010/2011	400	17.5
2011/2012	374	43
2013/2014	351.5	25
2015/2016	408	42

Source: Department of Census and Statistic

**Figure 4.10: Cultivation Extent of Maize (ha)**



**Figure 4.11: Maize Cultivation in Vavuniya District**

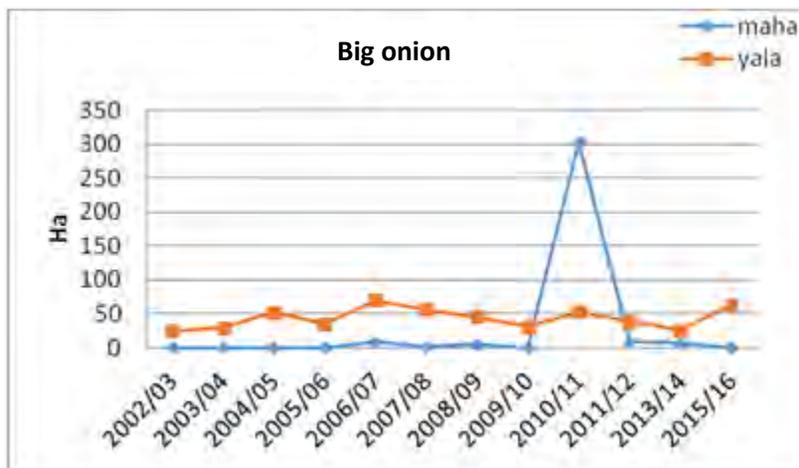
During the last ten years extent of maize cultivation had increased in the *Maha* season but in the *Yala* season it was fluctuating.

#### 4.5.9 Big onion Cultivation

**Table 4.13: Cultivation Extent of Big onion (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2002/2003	-	25
2003/2004	-	29.5
2004/2005	-	52
2005/2006	-	35.5
2006/2007	9	70
2007/2008	1.5	56.5
2008/2009	5.25	45.4
2009/2010	-	31.35
2010/2011	303	53
2011/2012	8.5	39
2013/2014	7	26
2015/2016	-	63

Source: Department of Census and Statistics



**Figure 4.12: Big onion Cultivation in Vavuniya District**

During the last 12 years in the *Yala* seasons it was fluctuating. But in 2010/11 *Maha* season it showed a sudden upturn and then dropped to zero.

#### 4.6 Cost of Cultivation

Tables 4.14, 4.15 below show the seed requirement, average cost of cultivation, revenue and profit margin for particular crops in the *Maha* and the *Yala* seasons in 2015. The data was gathered through focus group discussions with farmers. Here the imputed cost is not included. Black gram, Green gram, groundnuts and green chilli were the major crops in Vavuniya.

The table indicates the cost of production for each OFC calculated on the basis of revenue for each crop. The cost includes the cost of seed requirement and the cost of mostly used cultivation methods in the *Maha* season in 2015.

**Table No. 4.14: Farmers' View of Seed Requirement for an Acre in Vavuniya District**

<b>Crop</b>	<b>Seed requirement for an acre</b>	<b>Average last season seed price-(2015-maha)</b>	<b>Method of cultivation</b>
Black gram	Average 10-12 kg	<ul style="list-style-type: none"> <li>Private Trader - Rs250 to Rs350(Per/kg)</li> <li>ADC- Rs110 to Rs 180</li> </ul>	Broadcasting
Green gram	Average 10-12 kg	<ul style="list-style-type: none"> <li>Private Trader – Rs180 to Rs250(Per/kg)</li> </ul>	Broadcasting
Cowpea	Average 10-12 kg	<ul style="list-style-type: none"> <li>Private Trader - Rs200 to Rs300(Per/kg)</li> </ul>	Broadcasting
Groundnut	Average 40-50kg	<ul style="list-style-type: none"> <li>Private Trader – Rs 9000 to Rs 10000(50kg)</li> </ul>	Manual line method
Chilli	4000 plant-500g/seeds	<ul style="list-style-type: none"> <li>Ka-2 , 100g is around Rs 750.00</li> </ul>	Nursery and Transplanting
Red onion	Average 40-50 Kg	<ul style="list-style-type: none"> <li>Private Trader-Rs 9000 to Rs10000</li> </ul>	Nursery

Source: - Field Survey - 2016

**Table 4.15. Cost of Cultivation**

<b>Crop</b>	<b>Cost of Cultivation (Rs)</b>	<b>Revenue (Rs)</b>	<b>Profit (Rs)</b>
Groundnut	Average cost Rs 50,000.00 ( <i>Maha</i> )-Rainfed	(9000 * 14 bags(Avg)) = Rs 126,000.00	Rs. 76,000.00
	Average cost Rs 80,000.00 ( <i>Yala</i> )-Agro wells	( 9000* 19 bags (Avg)) = Rs 171,000.00	Rs. 91,000.00
Black gram	Average cost Rs 25,000.00 ( <i>Maha</i> ) Rainfed	120*450 kg =Rs 54,000.00	Rs. 29,000.00
Chili	Average cost Rs 50,000.00	RS.100,000.00	Rs. 50,000.00
Green gram	Average cost Rs 25,000.00 ( <i>Maha</i> )	150*400 kg = Rs 60,000.00	Rs. 35,000.00

Source: Field Survey - 2015

#### **4.7 Views of Agriculture Sector Officials in Vavuniya about Problems Related to OFC Farming**

Shortage of field level and higher level agriculture officers for planning, monitoring and technology transfer to the farmer is a snag. Due to the weakness of repayment by the farmers it is difficult to distribute high quality OFC seed under the scheme of 50% subsidy.

Low production and productivity, wide gap between potential and farmer yield, high cost of production are observable issues.

Low farm income, degraded lands, when soil is exposed to intensive rains it is subject to severe erosion, inadequate knowledge for seed treatment and packing, farmers' less knowledge of IPM package for pest and diseases control, erratic and unexpected rains resulting in crop failure in *Maha* season were other concerns.

The agriculture officers suggested the importance of increasing the capacity of OFC consumption in the country. The regional health office should have conducted awareness creation programmes to various segments of the society such as pre school teachers and school children, pregnant and lactating mothers and workers of garment factories about the importance of the consumption of coarse grains, green legumes and oil crops. Next, they suggested the need to create awareness of applying IPM tools regarding pest control. They expressed the importance of expanding the establishment of traditional food preparation centers such as "Hela Bojun and Ammachchi". It is relevant for women empowerment and women education to improve OFC consumption family wise.

#### **4.8 Problem Analysis with Farmers**

##### **4.8.1 Problem Identification**

Data was gathered from the farmers in each Agrarian Development Centre area in the Vavuniya district. Table below shows the problems presented by the farmers in respective agrarian development centres.

The problems of OFC farmers identified in focus group interviews in seven agrarian development command areas in the Vavuniya district are given in Table 4.16. Seven major problems were brought out with regard to the following:

- i. Irrigation
- ii. Quality of seed
- iii. Machinery
- iv. Marketing
- v. Pests and diseases
- vi. Damage by wild animals
- vii. Land

To what extent these problems pressurize the farmers is pictured in Figure 4.12.

**Table 4.16: Problems Emerged in the Discussions**

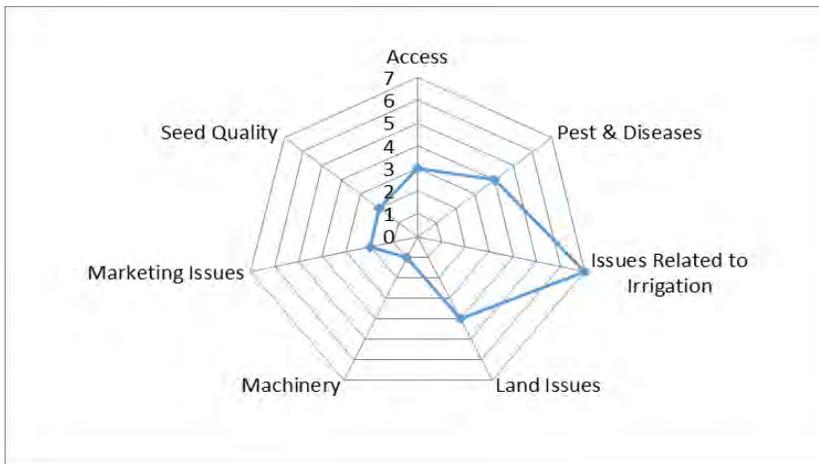
<b>Agrarian Service Centre</b>	<b>The Village</b>	<b>Type of Village</b>	<b>Number of Farmer Participation</b>	<b>Problems</b>
Kovilkulam	1. Asikkulam	T	08	<ul style="list-style-type: none"> <li>• Irrigation problems (need to renovate tanks)</li> <li>• Seed quality issues</li> <li>• Machinery issues</li> <li>• Marketing issues, pests and diseases</li> </ul>
Pampaimadu	1. Pampaimadu	T	07	<ul style="list-style-type: none"> <li>• Irrigation issue (not enough agro wells and sunk wells)</li> <li>• Animal problems</li> <li>• Seed quality issues</li> <li>• Marketing issues</li> </ul>
	2. Eechankulam	T	06	
	3. Kalmadu-Poompugar	T	15	
Cheddikulam	1. Cheddikulam	T	15	<ul style="list-style-type: none"> <li>• Land problem- (land scarcity and deeds)</li> <li>• Irrigation issues</li> <li>• Animal issues</li> </ul>
	2. Pavatkulam unit 4,6	C	12	
Nedunkeny	1. Nedunkeny	T	07	<ul style="list-style-type: none"> <li>• Animal issues</li> <li>• Land problems</li> <li>• Marketing issues</li> </ul>
	2. Senaipelavu	T	07	
Kanakarayankulam	1. Kanakarayankulam	T	06	<ul style="list-style-type: none"> <li>• Irrigation issue (need to renovate tank and canals)</li> <li>• Land problems</li> <li>• Marketing issues</li> </ul>
	2. Kollarpuliyankulam	T	12	
Madukantha	1. Maka-mailankulam	C	10	<ul style="list-style-type: none"> <li>• Land problem- (land scarcity and deeds)</li> <li>• Irrigation issues</li> <li>• Marketing issues</li> </ul>
Ulukkulam	1. Jana uthana gamma	T	15	<ul style="list-style-type: none"> <li>• Irrigation issues (no enough agro wells and sunk wells)</li> <li>• Animal issues</li> <li>• Marketing issues</li> </ul>
	2. Gala Slyambalawa	T	15	

Source: Field Survey-2016

#### 4.8.2 Problem Analysis: Vavuniya District

Data was gathered from the farmers in each Agrarian Development Centre in the Vavuniya district through focus group discussions. Accordingly, (Figure 4.13) the most serious problem encountered by the farmers is associated with irrigation. Those issues include siltation of minor irrigation tanks in the vicinity of cultivated lands, the insufficient number of agro wells, the issues related to renovation works of the irrigation canal system damaged due to poor construction quality.

Next are pests and diseases and land. According to the focus group discussions conducted at the development centers of Cheddikulam, Nedunkerny, Ulukkulam and Pampaimadu it was revealed that the outbreaks of pests and disease are the consequences of off-season cultivation and climate change. However, if knowledge of the technicalities to control these pests and diseases was provided by the Agriculture Instructors (AI), it would have eased this problem to a certain extent in the Vavuniya district.



**Figure 4.13: Problem Analysis of Vavuniya**

The least ranked problem among Vavuniya district farmers was unavailability of proper machinery at farm level. The problems related to seed quality, marketing issues and lack of access to input markets were other issues faced by these farmers.

According to the field survey 2016, farmers of the Vavuniya district confronted many issues related to seed quality and prices. The Agrarian Development Centers (ADC) provided high quality OFC seeds at subsidized prices. However, in the *Maha* season 2016 the ADC was able to fulfil only the seed requirement of Black gram and it also took a comparatively longer time to meet this requirement. The farmers shifted to private traders as an alternative at a comparatively higher cost; even then the farmers' believed those were of low quality.

## CHAPTER FIVE

### Kilinochchi District

#### 5.1 Analysis of the OFC Sector in Kilinochchi District

Kilinochchi district is situated in the Northern part of Sri Lanka. Geographically, most of the area lies on the mainland. The district covers a land area of approximately 1237.11sq. km and inland water covers an area of 444.30 sq.km. The land in Kilinochchi District could be categorized as flat with less than 10% slope. There are four major, five medium and 394 minor tanks all over the district; seven rivers connect to conserve rainwater (Annual Performance Report, District Secretariat of Kilinochchi-2016).

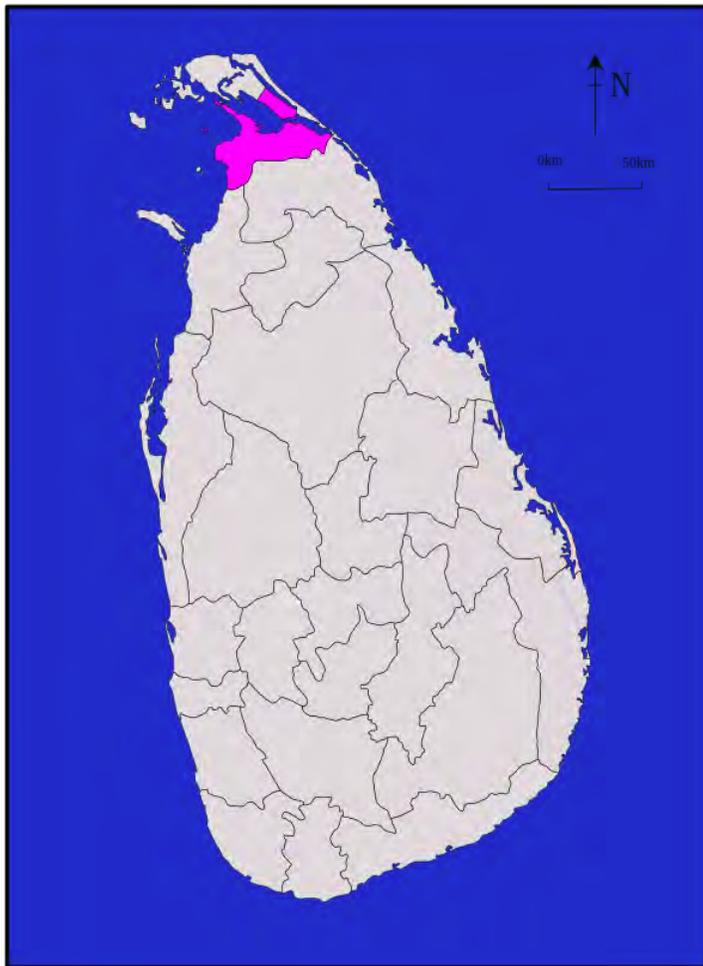


Figure 5.1: Kilinochchi District

In this report the current situation regarding the OFC cultivation in Kilinochchi comes under discussion. The farmers of Kilinochchi mostly cultivate groundnut, Black gram, Green gram, chilli, cowpea, maize and red onion. The extent of cultivated OFC in the district of Kilinochchi in 2015 was 1057.75 hectares and the total yield was 2020.63 Mt. But according to the farmers' statements production of other field crops decreased due to the damages caused by heavy rain and flood in early 2015.

The district has eight Agrarian Development Centers: Kilinochchi, Ramanathanpuram, Uruthirapuram, Akkarayankulam, Puliampokkanai, Mulakavil, Poonakary and Pachchilaipalli.

## 5.2 Extent of Other Field Crop Cultivated during *Maha* -2015/16 and *Yala* Season in 2016

**Table 5.1: Cultivated Extent of Other Field Crops**

<b>Crop</b>	<b><i>Maha</i> (Ha)</b>	<b><i>Yala</i> (Ha)</b>
Black gram	145	2.2
Green gram	218	167
Cowpea	153	61.3
Chilli	166.5	66.6
Red onion	30.5	12
Sesame	50.5	-
Maize	71	7.75
Groundnut	245	126
Kurakkan	8.75	1.85

Source: Statistical Hand Book (2016) - District Secretariat

## 5.3 Major Crop and Tank Details in Kilinochchi - 2012

Table 5.2 describes the number of tanks situated in each agrarian development command area and the main other field crops (OFC) cultivated.

**Table 5.2: Major Crops and Tank Details in Killinochchi District**

Agrarian Service Center	No of Tanks			Total	Main Crop Cultivation in this Area (Priority order)
	Working	Need Improvement	Breached		
Kilinochchi	10	12	-	22	Black gram , Cowpea, Red onion, Maize, Groundnut
Ramanathapuram	8	4	-	12	Black gram, Chilli, Groundnut
Uruthirapuram	4	1	-	5	Groundnut, Black gram, Chilli
Akkarayankulam	6	13	-	19	Black gram, Cowpea, Green gram, Groundnut
Puliyampokkanai	20	24	-	44	Black gram, Chilli, Red onion, Groundnut
Mulakavil	11	41	-	51	Groundnut , Black gram, Chilli, Groundnut
Poonakary	43	123	-	166	Black gram, Maize, Green gram and Cowpea
Pachchilaipalli	27	112	-	139	Maize, Black gram, Greeng Gram and Cowpea

Source: Statistical Hand Book - District Secretariat, (2016)

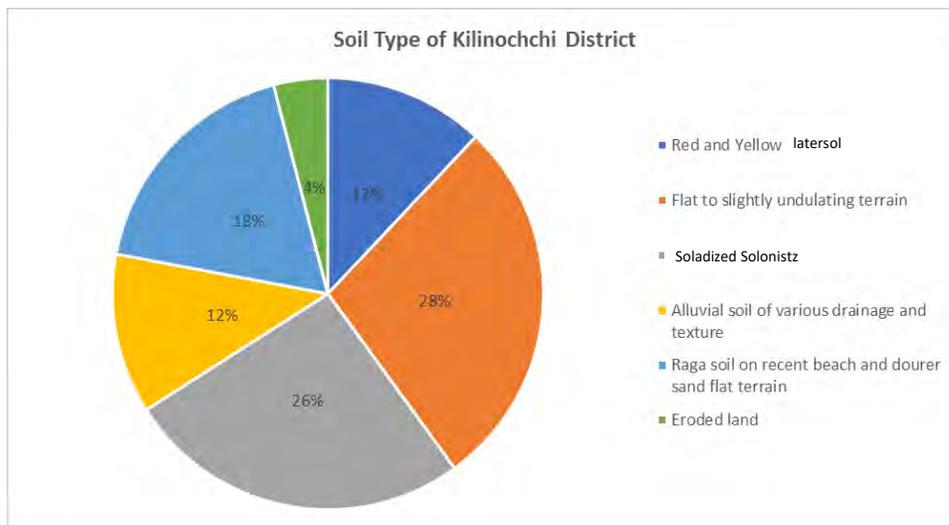
#### 5.4 Soil Type of Kilinochchi District (Estimated)

Table 5.3 shows the main types of soil in Kilinochchi district, and its suitability for crop cultivation. Most types of soil (96%) are suitable for cultivation.

**Table 5.3: Soil Types of Kilinochchi District**

No.	Soil Type	Percentage	Suitable Crop
1	Red and Yellow laterisol	12.04	Onions, Chilli, Vegetables, Fruit crops, Castor, Cassava
2	Flat to slightly undulating terrain	27.96	Onions, Chilli, Vegetables, Fruit Crops, Castor, Cassava
3	Soladized of solo check flat terrain	25.96	
4	Alluvial soil of various drainage and texture	11.99	Rice, Maize, Groundnut, Sugarcane, Sunflower, Cotton
5	Raga soil on recent beach and dourer sand flat terrain	17.99	
6	Eroded land	4.06	-
	<b>Total</b>	<b>100</b>	

Source: Statistical Hand Book (2016) - District Secretariat



Source: Statistical Hand Book - District Secretariat, (2016)

**Figure 5.2: Soil Types of Kilinochchi District**

Figure 5.2. shows the main type of soils in the Kilinochchi District. Of the total, more than 50% of soil types are suitable for crops such as onions, chilli, vegetables, fruit crops, castor, cassava, rice, maize, groundnut, sugarcane, sunflower, and cotton.

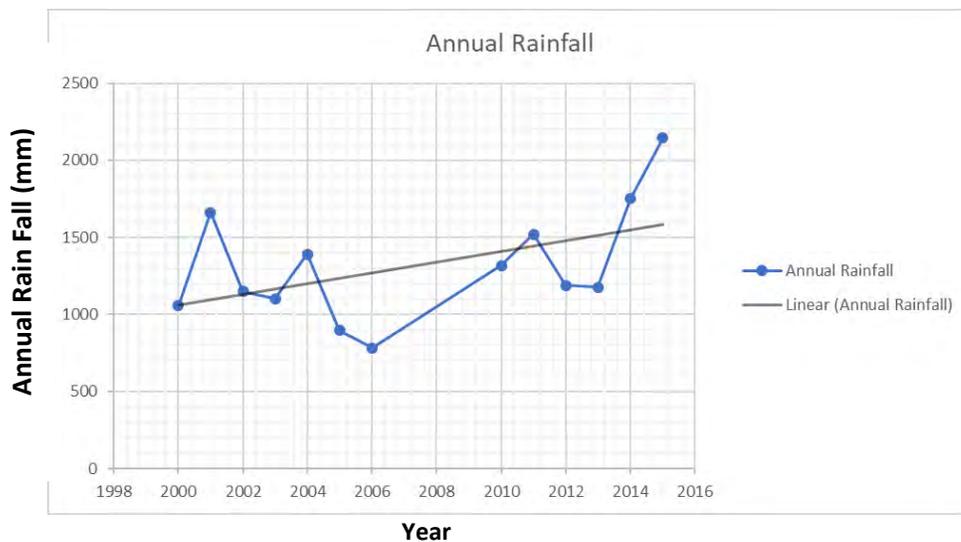
### 5.5 Annual Rainfall in Last 10 Years 2005-2015 (mm)

Table 5.4 shows the rain fall pattern during the last ten years in the district. Graph 5.3 shows that the rain fall has increased yearly.

**Table 5.4: Annual Rainfall Pattern**

Year	Annual Rainfall (mm)
2000	1055.70
2001	1663.23
2002	1147.71
2003	1101.51
2004	1390.73
2005	897.07
2006	781.27
2010	1319.00
2011	1520.57
2012	1187.33
2013	1177.80
2014	1754.10
2015	2143.67

Source: Statistical Hand Book (2016) - District Secretariat



Source: Statistical Hand Book - District Secretariat, (2016)

**Figure 5.3: Annual Rainfall in Kilinochchi District**

Figure 5.3 shows the rain fall pattern during the last ten years in the Kilinochchi District and has risen yearly. The highest rainfall has been recorded in 2016 and the lowest rainfall in 2006.

## 5.6 Crop wise Extent of OFC Cultivation in Kilinochchi

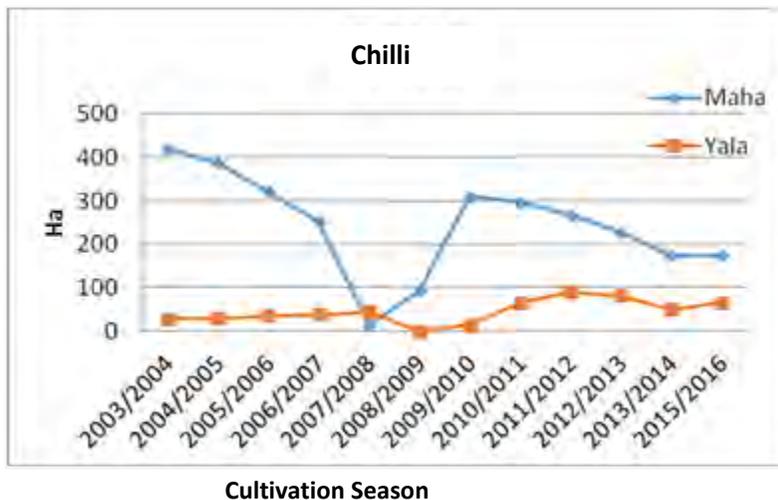
The tables and the graph reveal the crop wise extent of cultivation in both the *Maha* and *Yala* seasons.

### 5.6.1 Chilli Cultivation

**Table 5.5: Cultivation Extent of Chilli. (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2003/2004	420	29
2004/2005	387	30
2005/2006	320	36
2006/2007	252	39
2007/2008	15	45
2008/2009	94	0
2009/2010	310	15
2010/2011	296	65.5
2011/2012	267.5	90
2012/2013	227	82.5
2013/2014	173.5	49.8
2015/2016	173.5	66.1

Source: Statistical Hand Book (2016) - District Secretariat



Source: Statistical Hand Book - District Secretariat, Killinochchi (2016)

**Figure 5.4: Chilli Cultivation in Kilinochchi District**

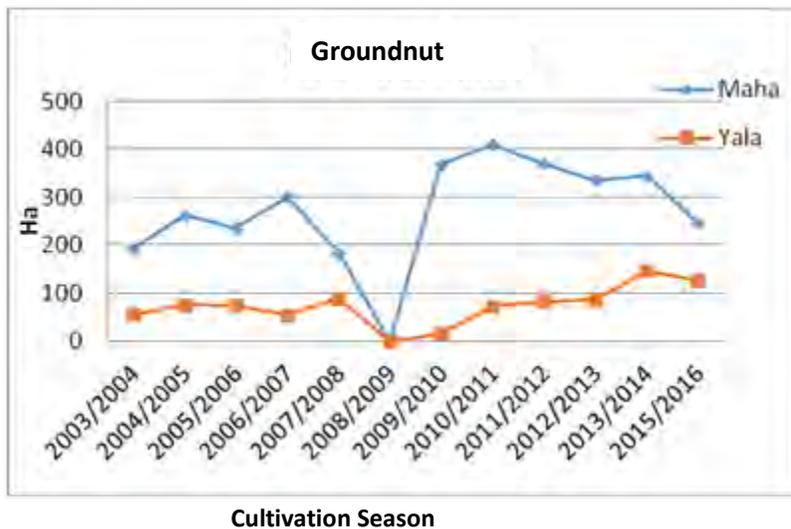
The above graph shows that the chilli cultivation has marked an upward trend during the period from 2008 to 2010 and then has dropped during the *Maha* seasons of last six years. However, during the last ten years in the *Yala* season fluctuations characterized the chilli cultivation (2008 and 2009 data was not gathered due to war)

## 5.6.2 Groundnut Cultivation

**Table 5.6: Cultivation Extent of Groundnut (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2003/2004	193	55
2004/2005	262	75
2005/2006	235	74
2006/2007	300	54
2007/2008	184	89
2008/2009	0	0
2009/2010	368	15
2010/2011	410	72
2011/2012	370	82
2012/2013	335.5	86
2013/2014	344	146
2015/2016	245	125.5

Source: Statistical Hand Book (2016) - District Secretariat



Source: Statistical Hand Book - District Secretariat, Killinochchi (2016)

**Figure 5.5: Groundnut Cultivation in Kilinochchi District**

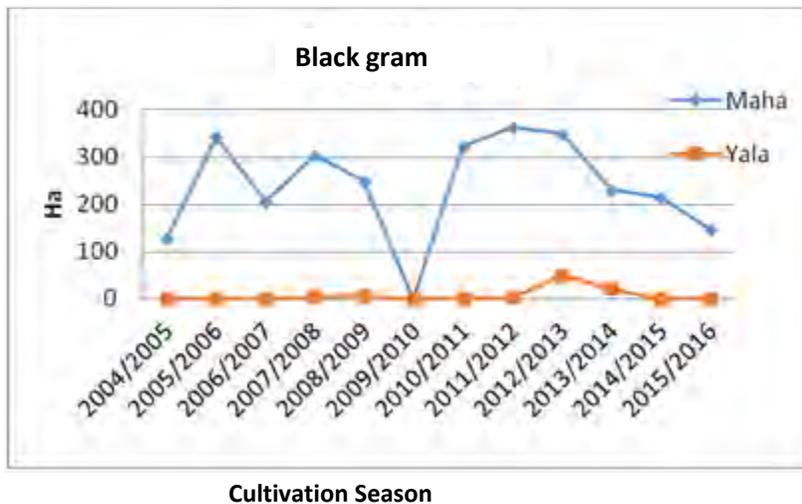
Figure 5.5 presents the fluctuations of the groundnut cultivation in the last ten years in the *Yala* and the *Maha* seasons (2008 and 2009 data not gathered properly due to war).

### 5.6.3 Black gram Cultivation

**Table 5.7: Cultivation Extent of Black gram**

Year	<i>Maha</i>	<i>Yala</i>
2004/2005	127	0
2005/2006	342	0
2006/2007	206	0
2007/2008	303	5
2008/2009	250	6
2009/2010	0	0
2010/2011	323	1
2011/2012	363	2
2012/2013	350	50
2013/2014	230.5	21.5
2014/2015	215	0
2015/2016	146.5	1

Source: Statistical Hand Book (2016) - District Secretariat



**Figure 5.6: Black gram Cultivation in Kilinochchi District**

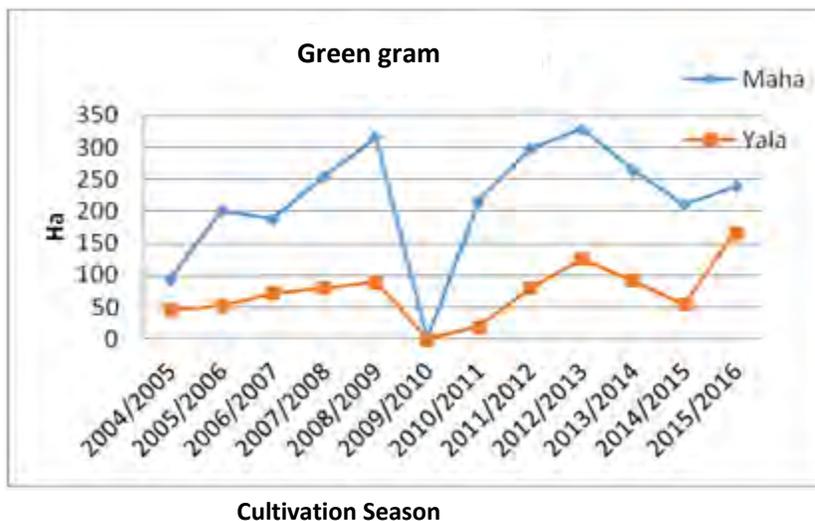
The graph shows the Black gram cultivation was on the increase during the last nine years in the *Maha* season but during the last ten years in the *Yala* season except for a couple of years the production was negligible.

#### 5.6.4 Green gram Cultivation

**Table 5.8: Cultivation Extent of Green gram (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2004/2005	94	47
2005/2006	201	53
2006/2007	188	72
2007/2008	255	80
2008/2009	316	89
2009/2010	0	0
2010/2011	216	20
2011/2012	298	80
2012/2013	329	126
2013/2014	265.5	92
2014/2015	211.5	55
2015/2016	239	167

Source: Statistical Hand Book (2016) - District Secretariat



**Figure 5.7: Green gram Cultivation in Kilinochchi District**

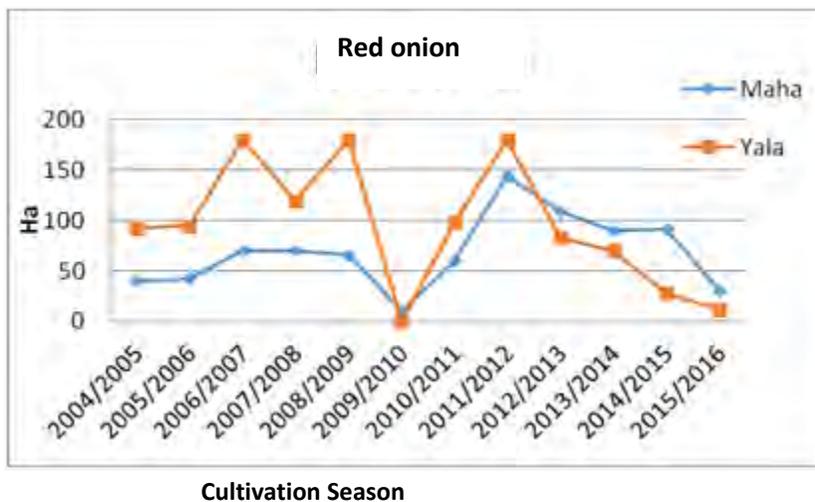
Figure 5.7 shows that the Green gram cultivation has fluctuated during the last ten years in the *Maha* season but during the last seven years in the *Yala* season it has marked a slow drop (2008 and 2009 data was not gathered due to war condition).

### 5.6.5 Red onion Cultivation

**Table 5.9: Cultivation Extent of Red Onion (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2004/2005	40	92
2005/2006	43	95
2006/2007	70	180
2007/2008	70	120
2008/2009	66	180
2009/2010	10	0
2010/2011	60	98
2011/2012	144	180
2012/2013	109	82.5
2013/2014	90	70.5
2014/2015	91.5	28
2015/2016	30.5	12

Source: Statistical Hand Book (2016) - District Secretariat



Source: Statistical Hand Book - District Secretariat, Killinochchi (2016)

**Figure 5.8: Red onion Cultivation in Kilinochchi District**

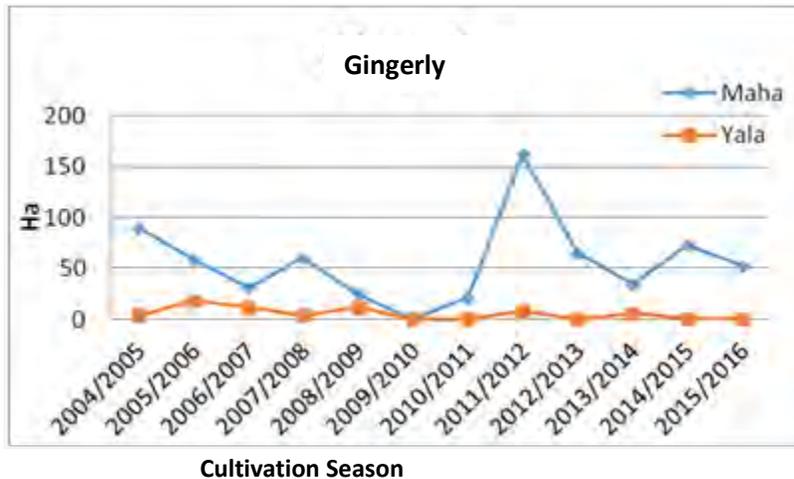
During 2013/14 *Yala* season red onion cultivation was much lower than in any other year, otherwise it fluctuated during the last five year *Maha* seasons (2008 and 2009 data was not gathered due to war).

### 5.6.6 Gingerly Cultivation

**Table 5.10: Cultivation Extent of Gingerly (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2004/2005	90	4
2005/2006	59	18
2006/2007	31	12
2007/2008	60	4
2008/2009	25	12
2009/2010	0	0
2010/2011	22	0
2011/2012	162	8.5
2012/2013	65	0.25
2013/2014	34.5	6
2014/2015	73	0.8
2015/2016	53	1

Source: Department of Census and Statistics



Source: Department of Census and Statistics

**Figure 5.9. Gingerly Cultivation in Kilinochchi District**

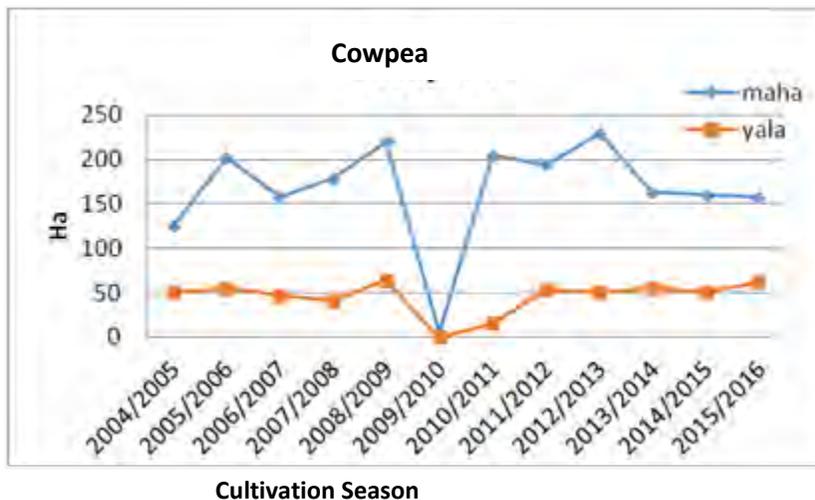
During the last 12 years extent of gingerly cultivation had its fluctuations. During the 2014/2015 *Maha* season extent of cultivation was on the increase (2008 and 2009 data could not be properly collected, due to war).

### 5.6.7 Cowpea Cultivation

**Table 5.11: Cultivation Extent of Cowpea (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2004/2005	125	50
2005/2006	202	55
2006/2007	158	47
2007/2008	179	41
2008/2009	220	64
2009/2010	5	0
2010/2011	205	16
2011/2012	194	53.5
2012/2013	229	50
2013/2014	163.4	55
2014/2015	160	51
2015/2016	157.3	61.5

Source: Department of Census and Statistics



Source: Department of Census and Statistics

**Figure 5.10: Cowpea Cultivation in Kilinochchi District**

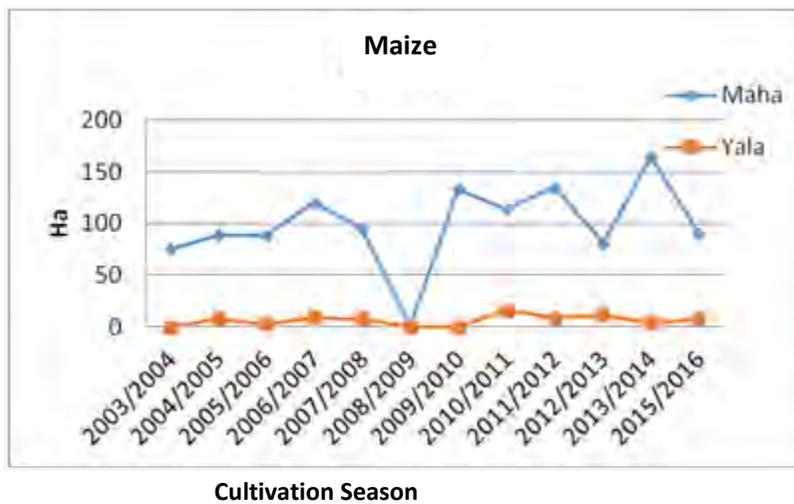
Extent of cowpea cultivation fluctuated during the last 12 years (2004/2005 to 2014/2015) in the *Maha* and the *Yala* seasons (2008 and 2009 data was not collected due to war).

### 5.6.8 Maize Cultivation

**Table 5.12: Cultivation Extent of Maize (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2003/2004	75	0
2004/2005	89	8
2005/2006	88	3
2006/2007	120	9
2007/2008	94	8
2008/2009	0	0
2009/2010	133	0
2010/2011	114	15.5
2011/2012	135	8.5
2012/2013	80.5	11.5
2013/2014	164	3.9
2015/2016	90	8

Source: Department of Census and Statistic



Source: Department of Census and Statistics

**Figure 5.11: Maize Cultivation in Kilinochchi District**

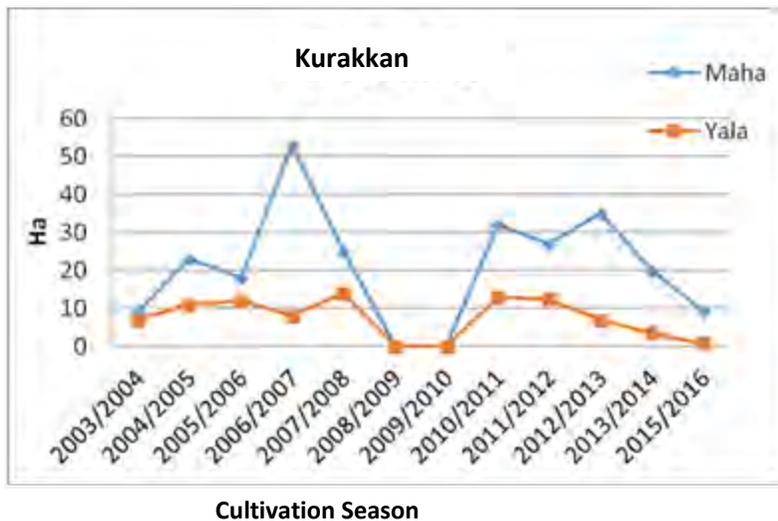
During the last ten years extent of maize cultivation increased in the *Maha* seasons. But in the *Yala*, cultivation was almost negligible.

### 5.6.9 Kurakkan Cultivation

**Table 5.13: Cultivation Extent of Kurakkan (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2003/2004	9	7
2004/2005	23	11
2005/2006	18	12
2006/2007	53	8
2007/2008	25	14
2008/2009	0	0
2009/2010	0	0
2010/2011	32	13
2011/2012	27	12.5
2012/2013	35	7
2013/2014	20	3.5
2015/2016	9.3	0.8

Source: Department of Census and Statistic



Source: Department of Census and Statistics

**Figure 5.12: Kurakkan Cultivation in Kilinochchi District**

The extent of cultivation of kurakkan was comparatively lesser than the cultivated extent of other subsidiary food crops. Most of the farmers cultivated kurakkan for home consumption with a little surplus for the market. In the *Yala* seasons the extent of kurakkan cultivation was lesser.

## 5.7 Cost of Cultivation

The Table 5.14 and 5.15 show the seed requirement, average cost of cultivation, revenue and profit for particular crops in the *Maha* and the *Yala* Seasons of 2015. These data was gathered from the focus group discussions with the farmers. Here imputed cost is not included. Black gram, Green gram, groundnuts, green chilli and gingerly are the major crops farmed in Kilinochchi.

**Table 5.14: Farmer Views of Seed Requirement per Acre in Kilinochchi District**

Crop	Seed Requirement for an Acre	Average Seed Price for 2015 - <i>Maha</i> Season	Method of Cultivation
Black gram	Average 10-12 kg	<ul style="list-style-type: none"> <li>• Private trader - Rs250 to Rs350(Per/Kg)</li> <li>• ADC- Rs110 to Rs 180</li> </ul>	Broadcasting
Green gram	Average 10-12 kg	<ul style="list-style-type: none"> <li>• Private trader – Rs180 to Rs250(Per/Kg)</li> </ul>	Broadcasting
Cowpea	Average 10-12 kg	<ul style="list-style-type: none"> <li>• Private trader - Rs200 to Rs300(Per/Kg)</li> </ul>	Broadcasting
Groundnut	Average 40-50kg	<ul style="list-style-type: none"> <li>• Private trader –Rs 9,000 to Rs 10,000(50Kg)</li> </ul>	Manual line method
Chilli	4000 plant-500g/seeds	<ul style="list-style-type: none"> <li>• Ka-2 , 100g is around Rs 750.00</li> </ul>	Nursery and Transplanting
Red Onion	Average 40-50 Kg	<ul style="list-style-type: none"> <li>• Private trader-Rs 9,000 to Rs10,000</li> </ul>	Nursery
Gingerly	Average 4 to 5 Kg	<ul style="list-style-type: none"> <li>• Private trader-Rs 250 to Rs 300</li> </ul>	Broadcasting

Source: Field Survey-2016

**Table 5.15: Cost of Cultivation**

Crop	Cost of Cultivation (Rs)	Revenue (Rs)	Profit (Rs)
Groundnut	Average cost Rs 50,000.00 ( <i>Maha</i> )-Rainfed	(9000 * 14 bags(Avg)) =Rs 126,000.00	Rs 76,000.00
	Average cost Rs 80,000.00 ( <i>Yala</i> )-Agro wells	(9000* 19 bags(Avg)) =Rs 171,000.00	Rs 91,000.00
Black gram	Average cost Rs 25,000.00 ( <i>Maha</i> ) Rainfed	120*450 kg =Rs 54,000.00	Rs 29,000.00
Chilli	Average cost Rs 50,000.00	RS.100,000.00	Rs.50,000.00
Green gram	Average cost Rs 25,000.00 ( <i>Maha</i> )	150*400 kg =Rs 60,000.00	Rs 35,000.00
Gingerly	Average cost Rs8,000.00( <i>Maha</i> )	Rs 7,000.00	

Source: Field survey, 2016

## 5.8 Problem Analysis with Farmers

### 5.8.1 Problem Identification

Data was collected from the farmers in each Agrarian Development Center area in the Kilinochchi district. Table 5.16 a detailed list of the location covered and the participant respondents and their major issues.

**Table 5.16: Problem Emerged in the Discussions**

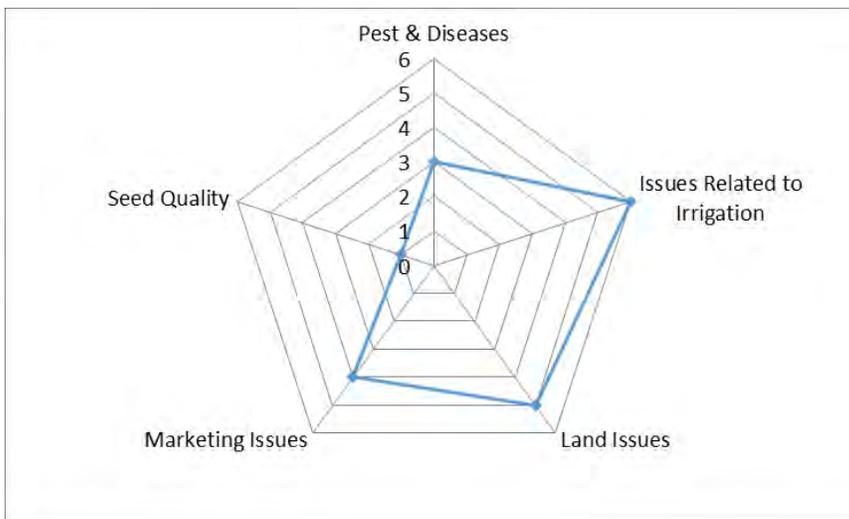
Agrarian Service Centers	Visited Village	Type of Village	Farmer Participation	Problem-1
Kilinochchi	1. Jeyanthinagar	C	8	<ul style="list-style-type: none"> <li>• Land problems</li> <li>• Irrigation problems (need to renovate tanks)</li> <li>• Need agro wells</li> </ul> Remark: Jeyanthinagar village is situated near the Kilinochchi town; so farming is less comparative to other areas.
	2. Ambalkulam	C	10	
	3. Santhapuram	C	15	
Ramanathapuram	1. Mayavanoor	C	12	<ul style="list-style-type: none"> <li>• Irrigation issue (not enough agro wells and dug wells)</li> <li>• Animal problems</li> <li>• Seed quality issues</li> <li>• Marketing issues</li> </ul>
Puliyampokkanai	1.Kaddakadu	T	10	<ul style="list-style-type: none"> <li>• Land problem-(land scarcity and deeds)</li> <li>• Irrigation issues</li> <li>• Animal issues</li> </ul>
	2.Piramnthanaru	C	10	
Akkarayankulam	1. Kannakipuram	C	15	<ul style="list-style-type: none"> <li>• Animal issues</li> <li>• Land problems</li> <li>• Marketing issues</li> </ul>
Mulakavil	1. Palankulam	C	12	<ul style="list-style-type: none"> <li>• Irrigation issue (need to renovate tank and cannels)</li> <li>• Land problems</li> <li>• Marketing issues</li> </ul>
Uruthirapuram	1.Malayalapuram	C	12	<ul style="list-style-type: none"> <li>• Land problem-(land scarcity and deeds)</li> <li>• Irrigation issues</li> <li>• Marketing issues</li> </ul>
	2. Maniyankulam	C	10	

Source: Field Survey-2016

### 5.8.2 Problem Analysis: Kilinochchi District

According to the field survey conducted in the Kilinochchi district the major problem is related to irrigation which includes siltation of minor irrigation tanks in the vicinity of cultivated lands, the insufficient number of agro-wells and the issues related to the renovation works of the irrigation canal system which has nearly broken down because the quality of construction has not been up to standard. Secondly, land issues have affected the farmer community. Those issues are reported in villages coming under the purview of Kilinochchi, Pulympokkanai, Akkarayankulam, Mulankavil and Uruthirapuram ASC. Fragmentation, productivity issues, land degradation and land ownership problems are other debacles.

As transpired in the dialogue with the farmers unawareness of the marketing process, absence of opportunities, inability to get fair prices for their products, not accruing the benefits of value addition, shortage of storage facilities and the presence of a large number of intermediaries in the marketing channels were the impediments besetting the farmer community. Quality of seeds was another setback the farmers suffered.



Source: field survey, 2016

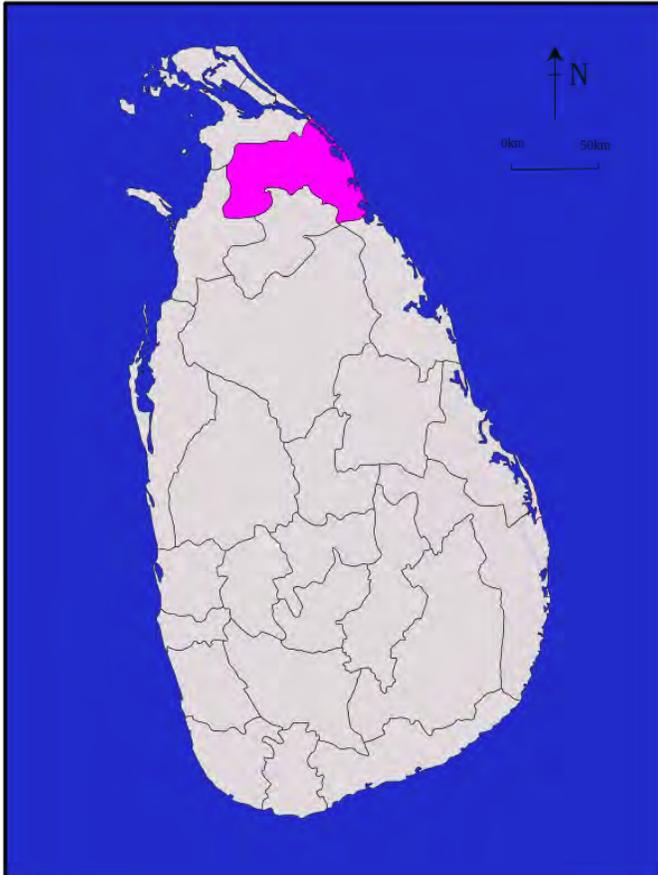
**Figure 5.13: Problem Analysis - Kilinochchi**



## CHAPTER SIX

### Mullaitivu District

#### 6.1 Analysis of the OFC Sector in Mullaitivu District



**Figure 6.1: Mullaitivu District**

Mullaitivu District is one of the newly created districts in Sri Lanka in 1979. This district occupies the eastern part of the main land of the Northern Province. The district covers a land area of approximately 2516.9 sq. km (including forest area but excluding large inland water courses). This district accounts for 3.8% of the country's total land area.

This district is bestowed with water courses, which could well be utilized for agricultural development. There are no major perennial rivers that could be tapped to provide irrigation for cultivation. The district has three major irrigation tanks with an irrigable area of 14536.0 acre ft., and another 17 medium tanks feed an area of 10594.0 acre ft., and minor irrigation tanks numbering 220 irrigate 11749 acre ft. in the district. Rain water is the major source of irrigation for agriculture.

Agriculture is the main income generating source. Totally 61% of the families depend on this sector, which has 16,737 ha of suitable land to undertake the paddy cultivation and 10,663ha for OFC cultivation. Three major tanks and 16 medium tanks feed the paddy lands of 7109 ha and 220 minor tanks feed paddy lands of 11749 ac in this district.

This report discusses the current situation regarding the OFC cultivation in Mullaitivu, district which has 10 Agrarian Development Centres: Kumulamunai, Alampil, Kokkuthoduwai, Mulliyawalai, Puthukudiyiruppu, Udayarkaddu, Oddusuddan, Olamadu, Thunukkai, Paandiyankulam. The farmers mostly cultivate groundnut, Black gram, Green gram, cowpea, maize, chilli and red onion.

**Table No 6.1: Extent of Other Field Crops Cultivated during *Maha* -2015/16 and *Yala* Season in 2016**

<b>Crop</b>	<b><i>Maha</i> (Ha)</b>	<b><i>Yala</i> (Ha)</b>
Groundnut	2350	934
Green gram	352	164
Black gram	1513	40
Chilli	370	180
Red onion	57	416
Big onion	9.5	54
Cowpea	325	203
Maize	150	79
Sesame	384	14

Source: District Secretariat, Mullaitivu, *Maha* 2015/2016 & *Yala* 2016-

## **6.2 Major Crop and Tank Details in Mullaitivu – 2015**

Table 6. 2 describes the number of tanks available in each agrarian services command areas and other field crop (OFC) cultivation in this area.

**Table 6.2: Major Crops and Tank Details in Mullaitive District**

Agrarian Service Center	No of Tanks			Total	Main Crop Cultivation in this Area (Priority order)
	Working	Need Improvement	Breached		
Mulliyawalai	21	8	-	29	Black gram , cowpea, red onion, maize, groundnut
Kumulamunai	7	5	-	12	Black gram , chilli, groundnut
Alampil	6	-	-	06	Groundnut, black gram, chilli
Kokkuthoduwai	12	-	-	12	Black gram, cowpea, green gram, groundnut
Puthukudiyiruppu	10	7	-	17	Black gram, chilli, red onion, groundnut
Udaiyarkaddu	12	-	-	12	Groundnut , Black gram, chilli, groundnut
Oddusuddan	37	30	-	67	Black gram, maize, green gram and cowpea
Olumadu	30	28	-	58	Maize, black gram, green gram and cowpea
Thunukkai	20	5	-	25	Black gram, green gram, and cowpea
Paandiyankulam	39	18	-	57	Black gram, green gram and cowpea

Source: - Annual Performance Report, District Secretariat of Mullaitivu, 2015

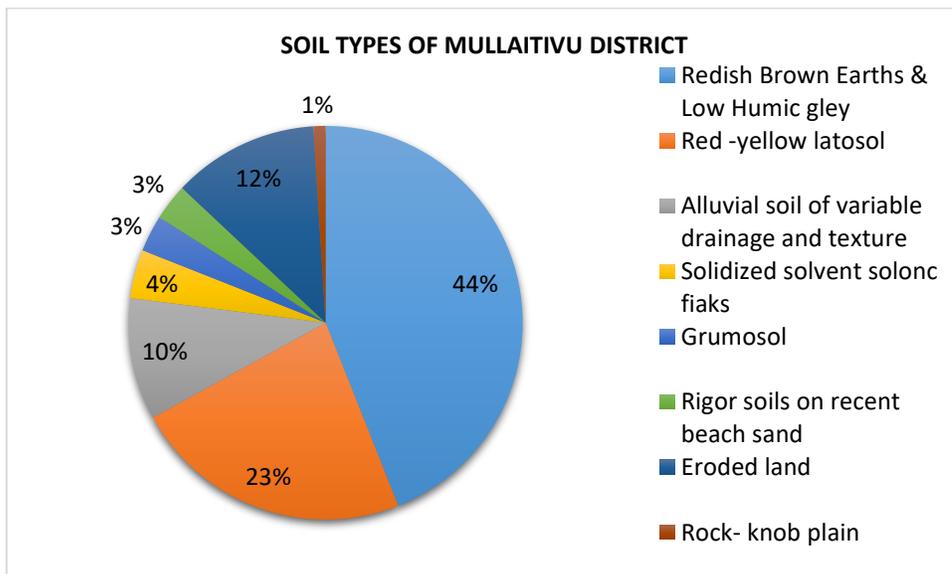
### 6.3 Soil Type of Mullaitivu District (Estimated)

Table 6.3 shows the main types of soil in Mullaitivu district, and its suitability for crop cultivation.

**Table 6.3: Soil Type of Mullaitivu District (estimated)**

No	Soil Type	Percentage	Suitable Crop
1.	Reddish Brown Earths & Low Humic gley Soils	44	Onions, chilli, rice, tobacco, vegetables, fruit crops
2.	Red -yellow latosol	23	Onions, chilli, cotton, timber tree, cassava, sugarcane
3.	Alluvial soil of variable drainage and texture	10	Onions, chilli, cotton, timber tree, cassava, sugarcane
4.	Solidized solonetz and solonchaks: Flat terrain	4	Onions, chilli, rice, tobacco, vegetables, fruit crops
5.	Grumosol	3	-
6.	Rigor soils on recent beach sand	3	-
7.	Eroded land	12	Rice, vegetables, fruit crops
8.	Rock- knob, plain	1	-
	<b>Total</b>	<b>100</b>	

Source: Department of Agriculture (extension), Mullaitivu, 2016



Source: Annual Performance Report 2015, District Secretariat of Mullaitivu

**Figure 6.2: Soil Types of Mullaitivu District**

Figure 6.2 shows the main types of soil in the Mullaitivu district and its suitability for crop cultivation. Reddish brown earths and low humic gley soils. Red-yellow Latosol.

eroded land and alluvial soil of variable drainage and texture are the most suitable soil types for cultivation.

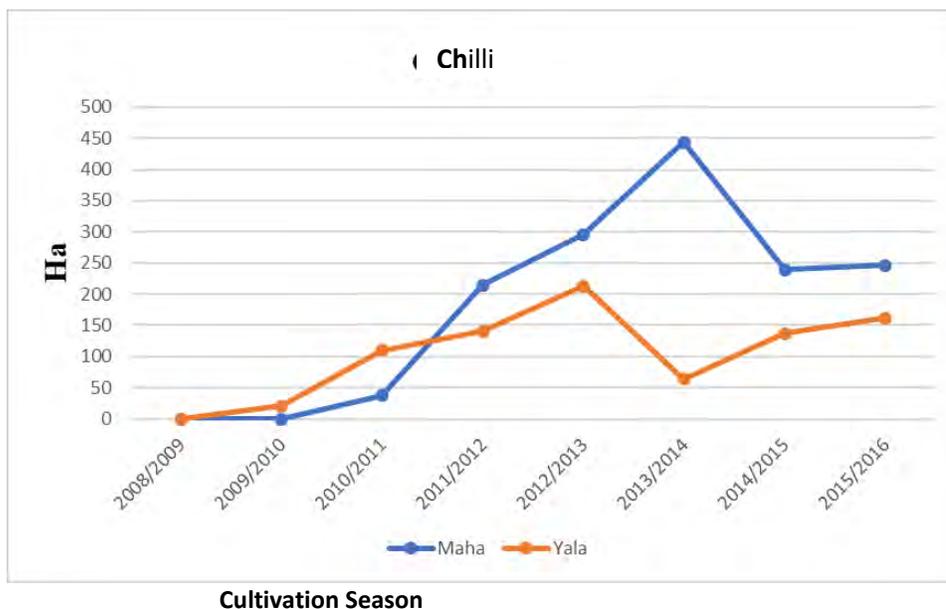
## 6.4 Crop wise Extent of OFC Cultivation in Mullaitivu District

### 6.4.1 Chilli Cultivation

**Table 6.4: Cultivation Extent of Chilli (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2008/2009	-	-
2009/2010	-	21
2010/2011	38	110
2011/2012	215	141
2012/2013	296	213
2013/2014	444	64
2014/2015	239	137
2015/2016	246	162

Source: Department of Census and Statistics



Source: Department of Census and Statistics

**Figure 6.3: Chilli Cultivation in Mullaitivu District**

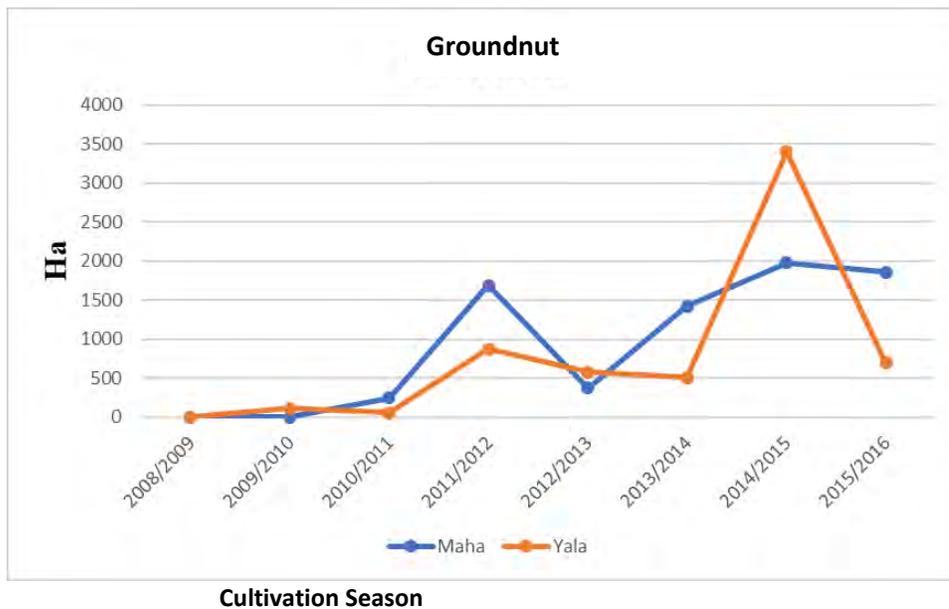
Figure 6.3 shows that the chilli cultivation has marked a slow increase from the years 2008/2009 to 2012/2013 both in the *Yala* and the *Maha* seasons. The cultivation in the *Maha* season was higher than that of the *Yala* season, after 2011/2012.

## 6.4.2 Groundnut Cultivation

**Table 6.5: Cultivation Extent of Groundnut (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2008/2009	-	-
2009/2010	-	21
2010/2011	38	110
2011/2012	215	141
2012/2013	296	213
2013/2014	444	64
2014/2015	239	137
2015/2016	246	162

Source: Department of Census and Statistics



Source: Department of Census and Statistics

**Figure 6.4: Groundnut Cultivation in Mullaitivu District**

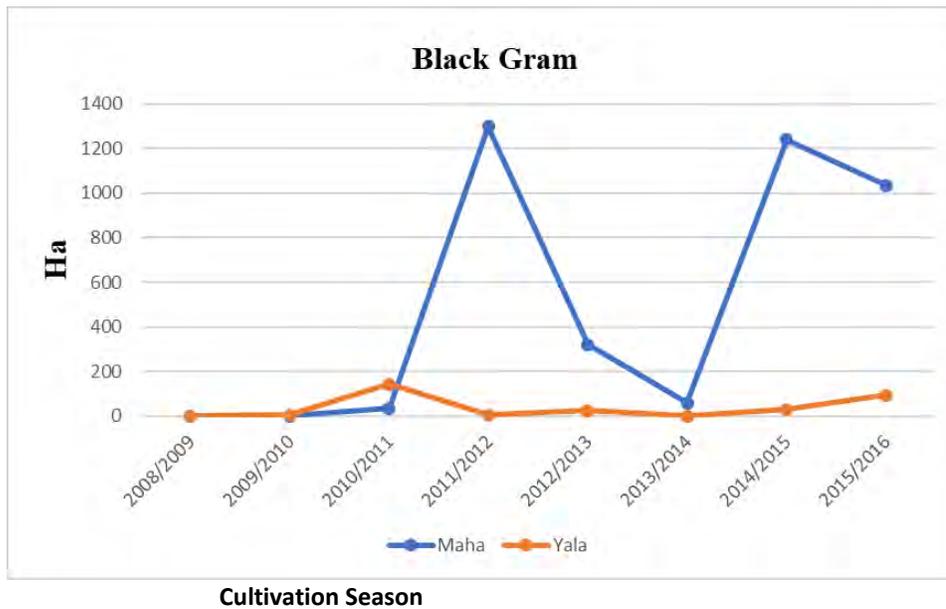
Figure (6.4) shows that the groundnut cultivation has fluctuated during the last eight years in the *Yala* and the *Maha* seasons. In the year 2014/2015, the *Yala* season has shown a sharp increment. Yet in the year 2015/2016 it has dipped considerably.

### 6.4.3 Black gram Cultivation

**Table 6.6: Cultivation Extent of Black gram (Ha)**

Year	<i>Maha</i>	<i>Yala</i>
2008/2009	-	-
2009/2010	-	05
2010/2011	34	142
2011/2012	1300	04
2012/2013	320	24
2013/2014	59	-
2014/2015	1239	29
2015/2016	1036	93

Source: Department of Census and Statistics



Source: Department of Census and Statistics

**Figure 6.5: Black gram Cultivation in Mullaitivu District**

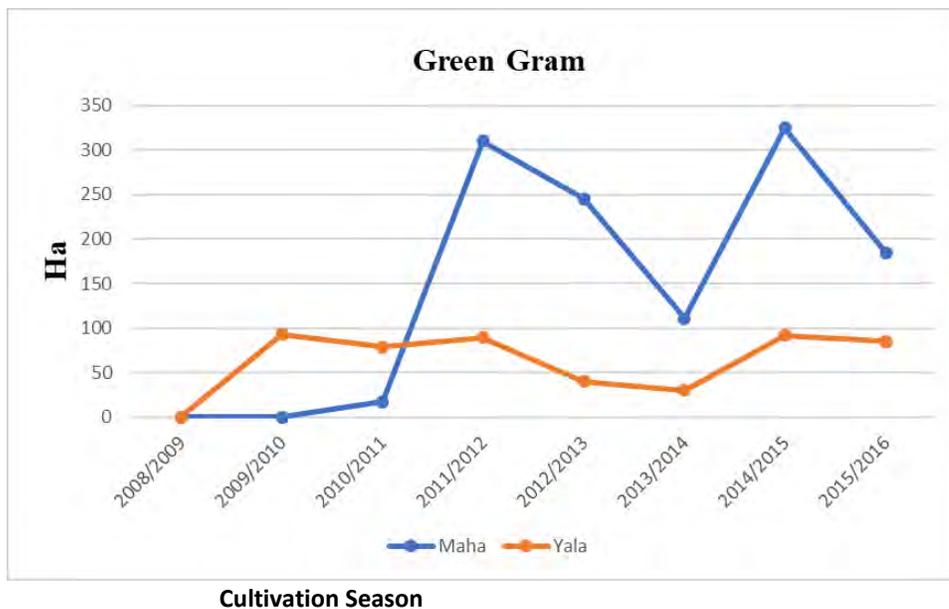
Figure 6.5 shows that the Black gram cultivation had fluctuated during the last eight years in the *Maha* season. Yet in the *Yala* season it was below 200ha.

#### 6.4.4 Green gram Cultivation

**Table 6.7: Cultivation Extent of Green gram (Ha)**

Year	<i>Maha</i>	<i>Yala</i>
2008/2009	-	-
2009/2010	-	93
2010/2011	17	79
2011/2012	310	89
2012/2013	245	40
2013/2014	111	30
2014/2015	325	92
2015/2016	185	85

Source: Department of Census and Statistics



Source: Department of Census and Statistics

**Figure 6.6: Green gram Cultivation in Mullaitivu District**

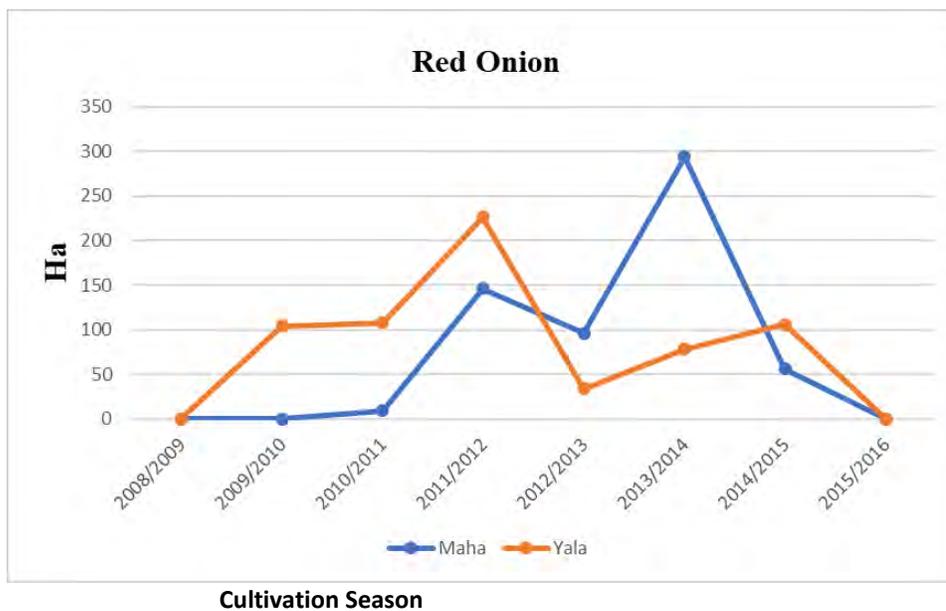
Figure (6.6) shows the Green gram cultivation had an upward trend during the last eight years in the *Maha* season. During this period in the *Yala* season it was unsteady.

### 6.4.5 Red onion Cultivation

**Table 6.8: Cultivation Extent of Red onion (Ha)**

Year	<i>Maha</i>	<i>Yala</i>
2008/2009	-	-
2009/2010	-	104
2010/2011	09	108
2011/2012	146	226
2012/2013	96	34
2013/2014	294	78
2014/2015	56	106
2015/2016	-	-

Source: Department of Census and Statistics



Source: Department of Census and Statistics

**Figure 6.7: Red onion in Mullaitivu District**

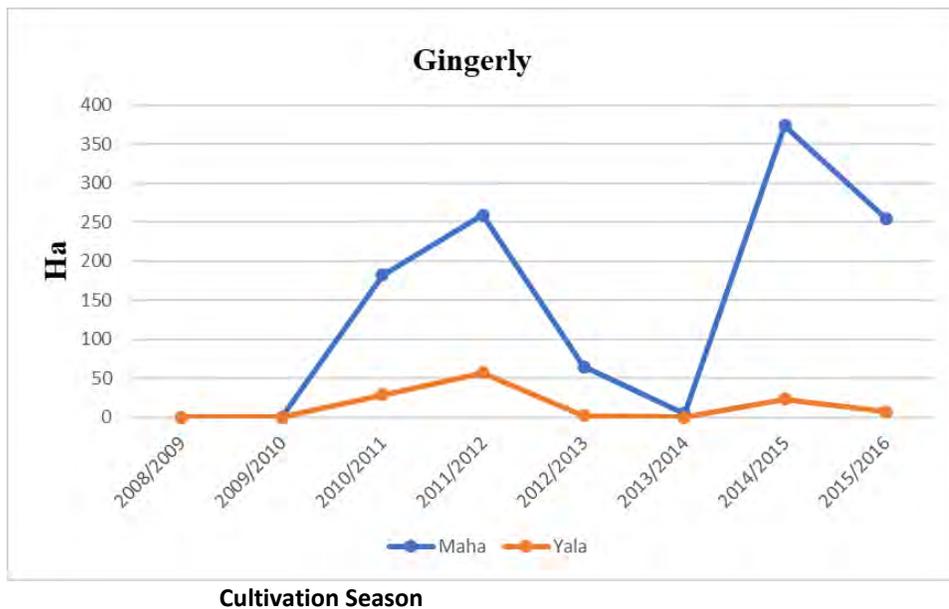
According to Figure 6.7, fluctuation of the red onion cultivation during the last eight years can be observed in both seasons. The cultivation in the *Maha* season is higher than that of the *Yala* season in the year 2012/2013 and 2013/2014.

### 6.4.6 Gingerly Cultivation

**Table 6.9: Cultivation Extent of Gingerly (Ha)**

Year	<i>Maha</i>	<i>Yala</i>
2008/2009	-	-
2009/2010	-	-
2010/2011	182	29
2011/2012	259	57
2012/2013	65	02
2013/2014	05	-
2014/2015	374	23
205/2016	255	07

Source: Department of Census and Statistics



Source: Department of Census and Statistics

**Figure 6.8: Gingerly Cultivation in Mullaitivu District**

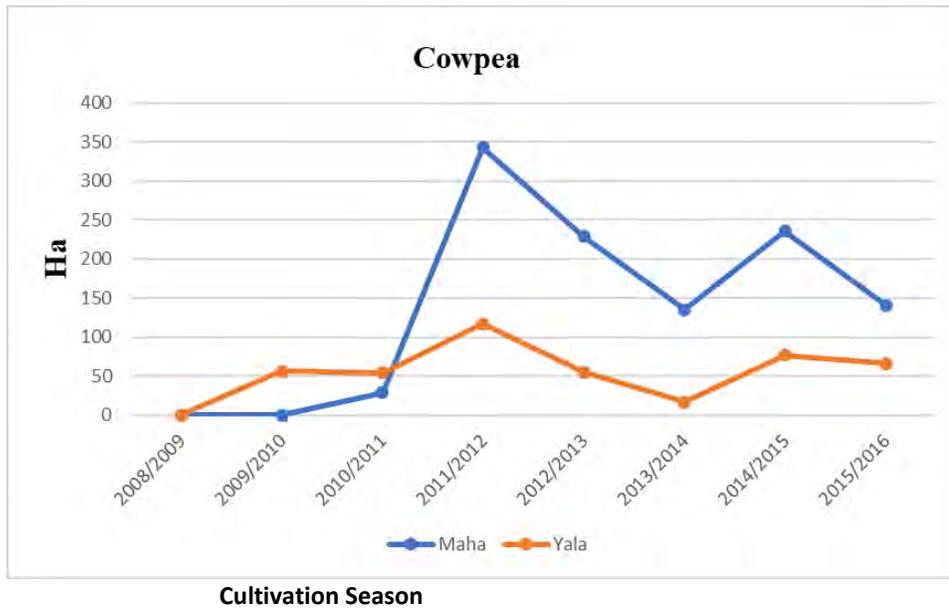
During the last eight years extent of gingerly cultivation fluctuated but in the last two years in the *Maha* season it showed an increase. During the last two years gingerly cultivation was fluctuating in the *Maha* season.

### 6.4.7 Cowpea Cultivation

**Table 6.10: Cultivation Extent of Cowpea (Ha)**

Year	<i>Maha</i>	<i>Yala</i>
2008/2009	-	-
2009/2010	-	56
2010/2011	29	54
2011/2012	343	117
2012/2013	229	55
2013/2014	135	17
2014/2015	236	77
2015/2016	141	66

Source: Department of Census and Statistics



Source: Department of Census and Statistics

**Figure 6.9: Cowpea Cultivation in Mullaitivu District**

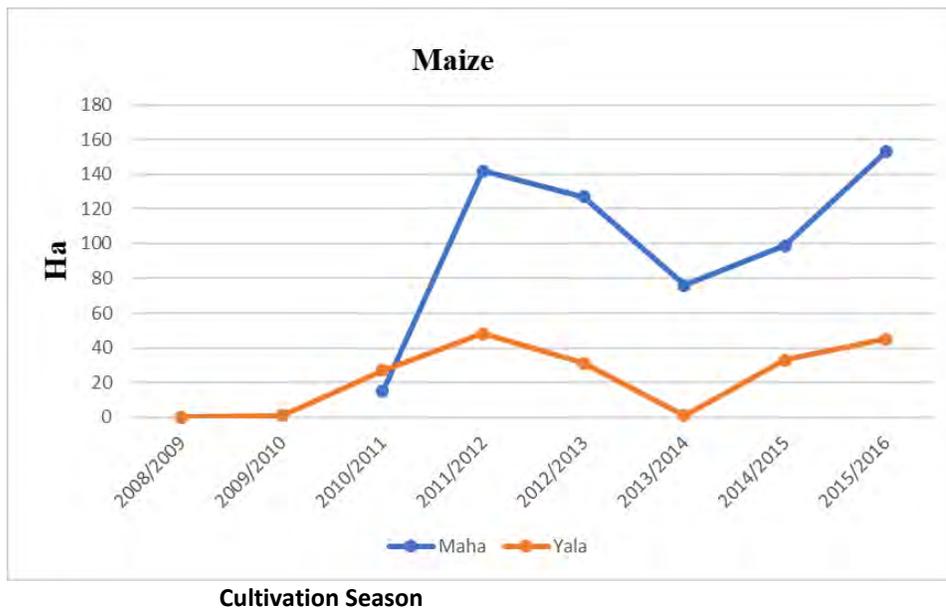
Extent of cowpea cultivation fluctuated during the last eight years, but during the year 2011/2012 in the *Yala* and the *Maha* seasons, cowpea cultivation marked an upward trend.

### 6.4.8 Maize Cultivation

**Table 6.11: Cultivation Extent of Maize (Ha)**

Year	<i>Maha</i>	<i>Yala</i>
2008/2009	-	-
2009/2010	-	01
2010/2011	15	27
2011/2012	142	48
2012/2013	127	31
2013/2014	76	01
2014/2015	99	33
2015/2016	153	45

Source: Department of Census and Statistics



Source: Department of Census and Statistics

**Figure 6.10: Maize Cultivation in Mullaitivu District**

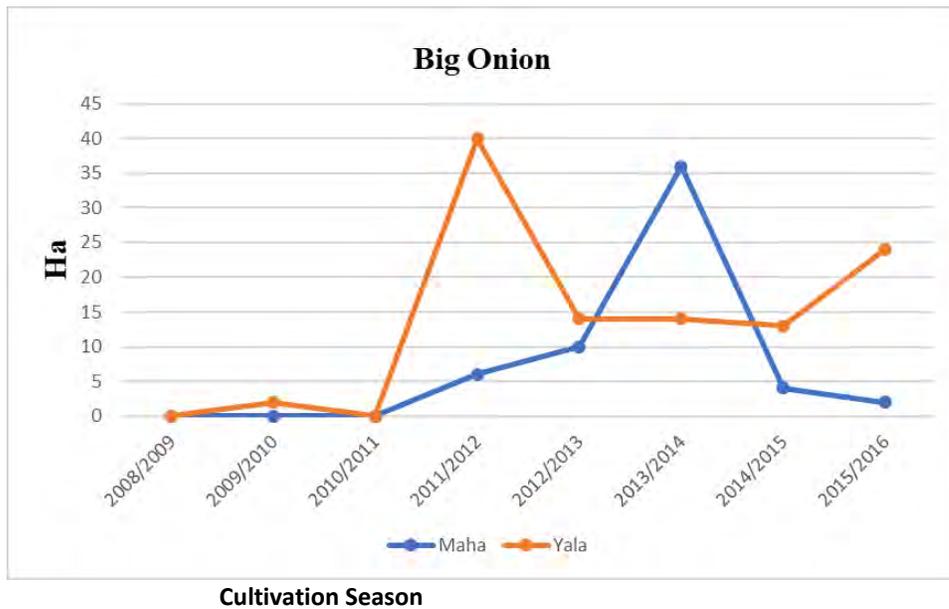
Fluctuation of the extent of maize cultivation can be seen during the last eight years. Yet, in the last two years of the *Maha* and *Yala* seasons, it marked an increase.

### 6.4.9 Big onion Cultivation

**Table 6.12: Cultivation Extent of Big onion(Ha)**

Year	<i>Maha</i>	<i>Yala</i>
2008/2009	-	-
2009/2010	-	02
2010/2011	-	-
2011/2012	06	40
2012/2013	10	14
2013/2014	36	14
2014/2015	04	13
2015/2016	02	24

Source: Department of Census and Statistics



Source: Department of Census and Statistics

**Figure 6.11: Big onion Cultivation in Mullaitivu District**

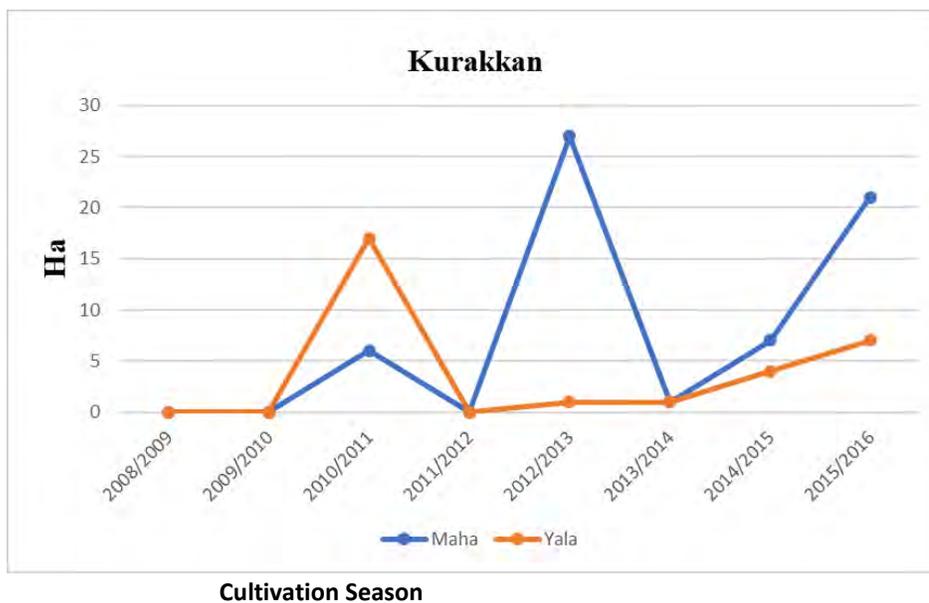
During the last eight years, big onion cultivation in both seasons fluctuated, but in the year 2011/2012 *Yala* season and 2013/2014 *Maha* it has spiked.

#### 6.4.10 Kurakkan Cultivation

Table 6.13: Cultivation Extent of Kurakkan (Ha)

Year	<i>Maha</i>	<i>Yala</i>
2008/2009	-	-
2009/2010	-	-
2010/2011	06	17
2011/2012	-	-
2012/2013	27	01
2013/2014	01	01
2014/2015	07	04
2015/2016	21	07

Source: Department of Census and statistics



Source: Department of Census and Statistics

Figure 6.12: Kurakkan Cultivation in Mullaitivu District

According to Figure 6.12, in the *Yala* and the *Maha* seasons, no significant fluctuation of kurakkan cultivation extent was observed during the eight years.

#### 6.5 Cost of Cultivation

Tables 6.14 and 6.15 show the seed requirement, average cost of cultivation, revenue and profit for particular crops in the *Maha* and the *Yala* season of 2015. Data was gathered through focus group discussions with the farmers. Here imputed cost is not included. Groundnut, black gram, green gram and green chilli are the major crops in Mullaitivu.

## Farmer Views of Seed Requirement per an Acre in Mullaitivu District

**Table 6.14: Cost for Seed**

<b>Crop</b>	<b>Seed requirement per an acre</b>	<b>Last season average seed price-(2015-Maha)</b>	<b>Method of cultivation</b>
Black gram	Average 10-12 kg	<ul style="list-style-type: none"> <li>Private trader - Rs250 to Rs350(Per/Kg)</li> <li>ADC- Rs110 to Rs 180</li> </ul>	Broadcasting
Green gram	Average 10-12 kg	<ul style="list-style-type: none"> <li>Private trader – Rs180 to Rs250(Per/Kg)</li> </ul>	Broadcasting
Cowpea	Average 10-12 kg	<ul style="list-style-type: none"> <li>Private trader - Rs200 to Rs300(Per/Kg)</li> </ul>	Broadcasting
Groundnut	Average 40-50kg	<ul style="list-style-type: none"> <li>Private trader – Rs 9000 to Rs 10000(50Kg)</li> </ul>	Manual line method
Chilli	4000 plant-500g/seeds	<ul style="list-style-type: none"> <li>Ka-2 , 100g is around Rs 750.00</li> </ul>	Nursery and Transplanting
Red onion	Average 40-50 Kg	<ul style="list-style-type: none"> <li>Private trader-Rs 9000 to Rs10000</li> </ul>	Nursery and Transplanting
Gingerly	Average 4-5 Kg	<ul style="list-style-type: none"> <li>Private trader-Rs 200 to Rs 250</li> </ul>	Broadcasting

Source: Field Survey-2016

**Table 6.15: Cost of Cultivation**

<b>Crop</b>	<b>Cost of Cultivation (Rs)</b>	<b>Revenue (Rs)</b>	<b>Profit (Rs)</b>
Groundnut	Average cost Rs 73,800.00 (Maha)-Rainfed	(10000 * 16 bags) =Rs 160,000.00	Rs 86,200.00
	Average cost Rs 90,000.00 (Yala)-Agro wells	(9000* 18 bags) =Rs 180,000.00	Rs 90,000.00
Black gram	Average cost Rs 25,000.00 (Maha) Rainfed	120*450 kg =Rs 54,000.00	Rs 29,000.00
Chili	Average cost Rs 50,000.00	RS.100,000.00	Rs.50,000.00
Green gram	Average cost Rs 25,000.00 (Maha) Rainfed	150*400 kg =Rs 60,000.00	Rs 35,000.00
Gingerly	Rs.12,000.00	150*150Kg =Rs 22,500.00	Rs10,500.00

Source: Field Survey-2016

## 6.6 Problem Analysis with Farmers

### 6.6.1 Identification of the Problems

Data was collected from the selected farmers from each Agrarian Development Centre area in Mullaitivu district. Table below lists the details of the locations visited and the number of respondent farmers who came out with their major issues.

**Table 6.16: Problems Emerged in the Discussions at each A.D.C Level**

Name of ASC (Agrarian Service Centres)	Village Visited	Type of Village	Farmer Participation	Problem-1
Kokkuthoduwai	1. Kokkuthoduwai	C	11	<ul style="list-style-type: none"> <li>• Animal problems</li> <li>• Transport issues (Road)</li> <li>• Financial issues</li> </ul>
Olumadu	1. Olumadu	T	12	<ul style="list-style-type: none"> <li>• Land issues</li> <li>• Irrigation issue (not enough agro wells and dug wells)</li> <li>• Animal problems</li> <li>• Transport issues (Road)</li> <li>• Marketing,</li> <li>• Financial</li> <li>• Machinery issues</li> <li>• APC activity Problem</li> </ul>
Udayarkaddu	1. Udayarkaddu-South	C	09	<ul style="list-style-type: none"> <li>• Irrigation issue (not enough agro wells and dug wells &amp; damages to cannels)</li> <li>• Animal problems</li> <li>• Seed quality</li> <li>• Marketing</li> <li>• Labour and</li> <li>• Machinery issues</li> </ul>
	2. Visvamadu- east	C	25	
	3. Visvamadu-west	T	12	
Thunukkai	1. Thunukkai	T	16	<ul style="list-style-type: none"> <li>• Irrigation issue (not enough agro wells and dug wells)</li> <li>• Transport issues (Road)</li> <li>• Seeds quality issues</li> </ul>

Panndiyankulam	1. Panndiyankulam	C	09	<ul style="list-style-type: none"> <li>• Marketing</li> <li>• Labour and</li> <li>• weeding chemical issues</li> <li>• APC activity Problem</li> </ul>
	2. Kollavilankulam	C	20	
Mulliyawalai	1. Marapuram muripu	T	11	<ul style="list-style-type: none"> <li>• Land issues</li> <li>• Irrigation issue (not enough agro wells and dug wells)</li> <li>• Animal problems</li> <li>• Seed quality</li> <li>• Marketing</li> <li>• Labour issues</li> <li>• Machinery issues</li> </ul>
	2. Uppumaveli	T	08	
	3. Vattapalai	T	10	
Alampil	1. Kokulai	C	12	<ul style="list-style-type: none"> <li>• Irrigation issue (not enough agro wells and dig wells)</li> <li>• Animal problems</li> <li>• Electricity problems</li> <li>• transport issues (Road)</li> </ul>
	2. Chemmalai	C	14	
Oddusuddan	1. Maanaruvi	C	21	<ul style="list-style-type: none"> <li>• Irrigation issue (not enough agro wells and dug wells)</li> <li>• Animal problems</li> <li>• Labour issues</li> <li>• Transport issues (Road)</li> <li>• APC activity Problem</li> <li>• Seeds quality issues</li> </ul>
	2. Vilakaththikulam	C	08	

Source: Field Survey - 2016

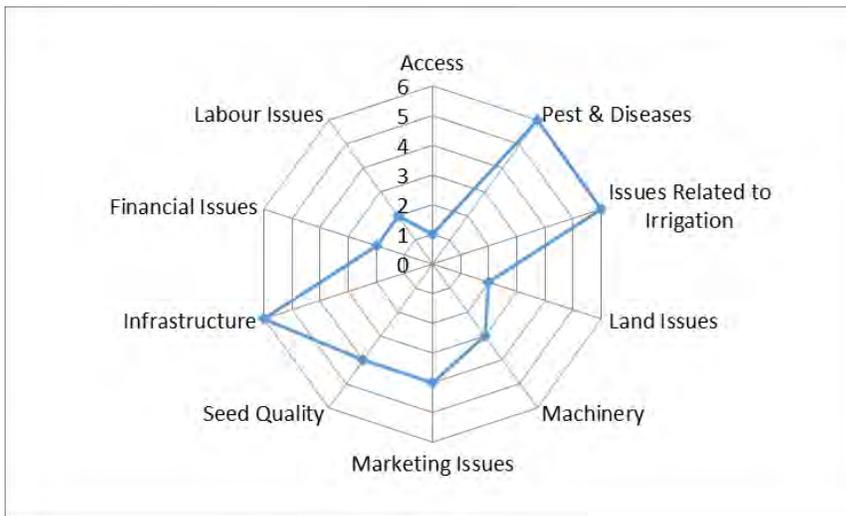
### 6.6.2 Problem Analysis in the District of Mullaitivu

According to the field survey in the Mullaitivu district, the major problems are related to irrigation infrastructure and pests and diseases. The irrigation issues include insufficient number of agro - wells and dug wells and damages to the canal system, in contrast to the other districts of the Northern Province. Specially the farmers in the district of Mullaitivu face several issues related to infrastructure facilities which include difficulties in obtaining power supply and lack of transport facilities.

The second most prevailing issues are seed quality and access to market. Those marketing issues include lack of knowledge in marketing, lack of opportunities, low price levels, lack of value addition and storing facilities and the presence of a large number of intermediaries in market channels which are common to the other districts of the province.

As transpired in the dialogue with the farmers, unawareness of the marketing process, absence of opportunities, inability to get fair prices for their products, not accruing the benefits of value addition, shortage of storage facilities and the presence of a large number of intermediaries in the marketing channels were the impediments besetting the farmer community.

Machinery, land, labour and financial issues were also brought to light by the farmers as their obstacles. The OFC cultivation in the Mullaitivu district is characterized by the use of labour intensive traditional agricultural methods, non – availability of machinery and unskilled labour. In the circumstances the OFC cultivation practices such as planting and harvesting have become time consuming and costly activities for the farmers because of the shortage of labour. Finding capital investment for the cultivation is a major problem in the district, intensified by the farmers’ unawareness of financial management and shortage of marketing facilities at the time of harvesting, which increase the farmers’ indebtedness. Rigid regulations, procedures and higher interest rates in obtaining loan facilities from non-government financial institutions make the farmers look for other sources of funding. pushing the farmers into deeper indebtedness.



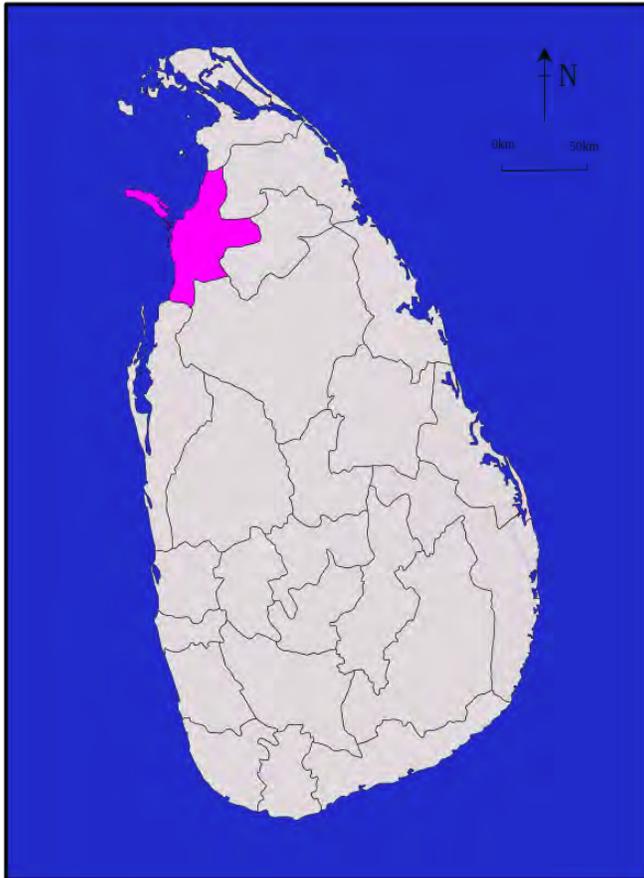
Source: Field survey, 2016

**Figure 6.13: Problem Analysis in Mullaitivu District**

## CHAPTER SEVEN

### Mannar District

#### 7.1 Analysis of the OFC Sector in Mannar District



Mannar district is situated in the North western part of Sri Lanka, and consists of a population of 151577. This district falls in the dry zone area and the climate is characterized by high temperature and low rainfall. The temperature ranges from 26.50<sup>0</sup> to 31.00<sup>0</sup> c and the average rainfall is 129.0 mn

Food crops other than rice primarily constitute the subsidiary food crop sector in Sri Lanka which comprise other field crops (OFCs) and vegetables cultivated on highland in both seasons and in low land in the dry season.

In this report the current situation regarding the OFC cultivation in Mannar is subject to discussion.

**Figure 7.1: Mannar District**

Mannar mostly cultivates groundnut, Green gram, black garm, cowpea, maize, chilli, red onion and big onion. The extent of OFC cultivation, in 2015 was 1200 ha. The yield was 3000 mt.

**Table 7.1: Extent of Other Field Crops Cultivated during *Maha* – 2015/16 and *Yala* Season in Mannar**

<b>Crop</b>	<b><i>Maha</i> (Ha)</b>	<b><i>Yala</i> (Ha)</b>
Black gram	250	3
Green gram	177	110
Cowpea	110	43
Chilli	185	102
Red onion	42	45
Big onion	35	11
Sesame	37	0
Maize	160	10
Groundnut	231	160
Ground Total (Ha) in Mannar	<b>1227 (71 %)</b>	<b>484 (29%)</b>

Source: Ministry of Agriculture, Other Field Crop Cultivation (2015/16)

## **7.2 Major Crops and Tanks in Mannar District - 2016**

Table 7.2 describes the number of tanks in each agrarian services command area and the extent of OFC cultivation in Mannar in the last 2015 *Maha* and the 2016 *Yala* seasons. The district has 11 Agrarian Service Centres: Mannar island, Uyilankulam, Nanattan, Murunkan, Manthai, Vidutalativu, Alkaddively, Illuppaikadavai, Palampiddy Iranailupaikulam, p.p Potkerny and Shilawathurai.

**Table 7.2: Major Crops and Tanks**

Agrarian Service Center	No of Tanks			Total	Main Crop Cultivation in this Area (Priority order)
	Working	Breached	Abandoned		
Mannar Island	1	0	0	1	Chilli, Red onion, Maize
Uyilankulam	2	0	0	2	Chilli, Red onion, Maize
Nanattan	6	0	2	8	Green gram, Chilli
Murunkan	35	19	5	59	Green gram, Chilli, groundnut
Manthai	5	2	6	13	Chilli, Black gram, groundnut
Vidataltivu	11	15	11	37	
Alkaddively	0	0	1	1	Red onion, black gram, green gram
Illupaikadavai	53	21	25	99	Green gram, Chilli
Palampiddy	4	12	10	26	Green gram, Chilli, red onion
Iranailupaikulam	22	23	50	95	Green gram, Chilli, groundnut
P.P Potkerny	29	0	1	30	Chilli, black gram, groundnut
Shilawathurai	7	6	3	16	Big onion, Cowpea

Source: Annual Performance Report, District Secretariat of Mannar-2016

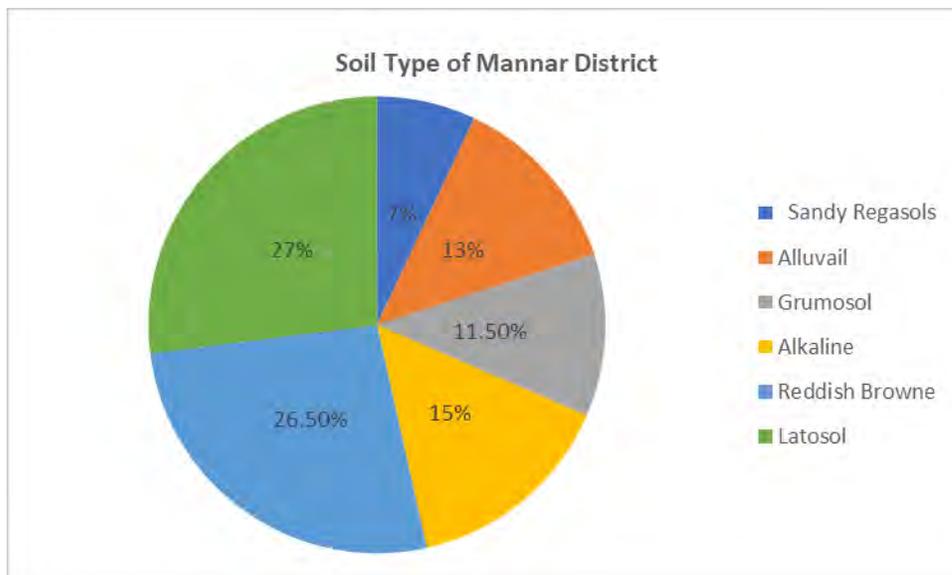
### 7.3 Soil Type of Mannar District

Table 7.3 shows the main types of soil in the Mannar district and its suitability for crop cultivation. Most of the soil types of (96%) are suitable for cultivation.

**Table 7.3: Soil Type of Mannar District**

No	Soil Type	Percentage	Suitable crop
1	Sandy Regasols	7%	Panaromio, palmyrah, coconut
2	Alluvail	13%	Rice, Maize, Groundnut, Sugarcane, Sunflower, Cotton
3	Grumosol	11.5%	Paddy, Adapted pasture grasses
4	Alkaline	15%	Fruit tree, Rice, coconut
5	Reddish Brown	26.5%	Rice, Onions, Groundnut, Sugarcane, Sunflower, Cotton, Timber tree, Chilli, Black gram, Green gram
6	Latosol	27%	Paddy, Adapted pasture grasses
	<b>Total</b>	<b>100%</b>	

Source: Annual Performance Report, District Secretariat of Mannar-2016



Source: Annual Performance Report, District Secretariat of Mannar, 2016

**Figure 7.2: Soil Types of Mannar District**

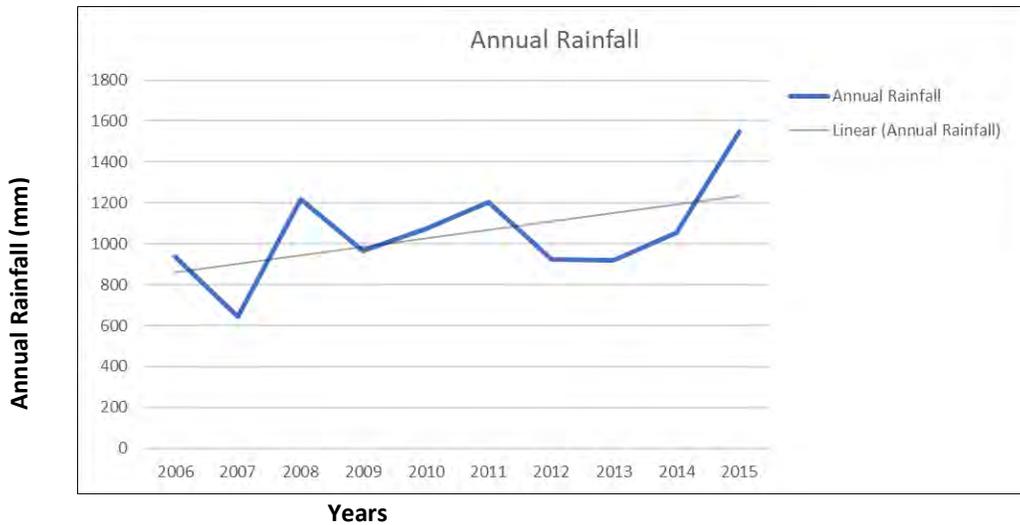
#### 7.4 Annual Rainfall Pattern during the Last 10 Years 2005-2015 (In mm)

Table 7.4 and graph 7.3 show the rain fall pattern during the last ten years in the district. The rain fall has risen yearly.

**Table 7.4: Annual Rainfall Pattern**

Year	Annual Rainfall
2006	938.4
2007	643.2
2008	1219.2
2009	964.8
2010	1075.2
2011	1203.6
2012	922.8
2013	919.2
2014	1052.4
2015	1548

Source: Annual Performance Report, District Secretariat of Mannar-2016



Source: Annual Performance Report, District Secretariat of Mannar, 2016

**Figure 7.3: Annual Rainfall in Mannar District**

## 7.5 Crop wise Extent of OFC Cultivation in Mannar

### 7.5.1 Chilli Cultivation

Table 7.5: Cultivation Extent of Chilli (ha)

Year	<i>Maha</i>	<i>Yala</i>
2008/2009	34	16
2009/2010	54	23
2010/2011	104	152
2011/2012	220	56
2012/2013	207	97
2013/2014	123	54
2014/2015	124	78
2015/2016	139	88

Source: Department of Census and Statistics



Source: Department of Census and Statistics

Figure 7.4: Chilli Cultivation in Mannar District

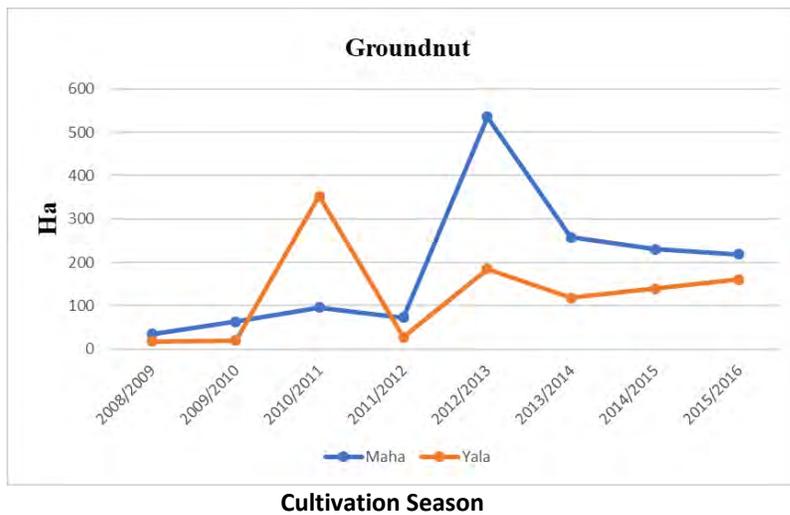
Figure 7.4 shows that the chilli cultivation had marked a drop during the last six years in the *Maha* season and during last five years, it has shown a slight fluctuation in the *Yala* season.

## 7.5.2 Groundnut Cultivation

**Table 7.6: Cultivation Extent of Groundnut (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2008/2009	35	18
2009/2010	63	20
2010/2011	96	353
2011/2012	73	77
2012/2013	536	185
2013/2014	258	118
2014/2015	230	139
2015/2016	219	160

Source: Department of Census and Statistics.



Source: Department of Census and Statistics

**Figure 7.5: Groundnut Cultivation in Mannar District**

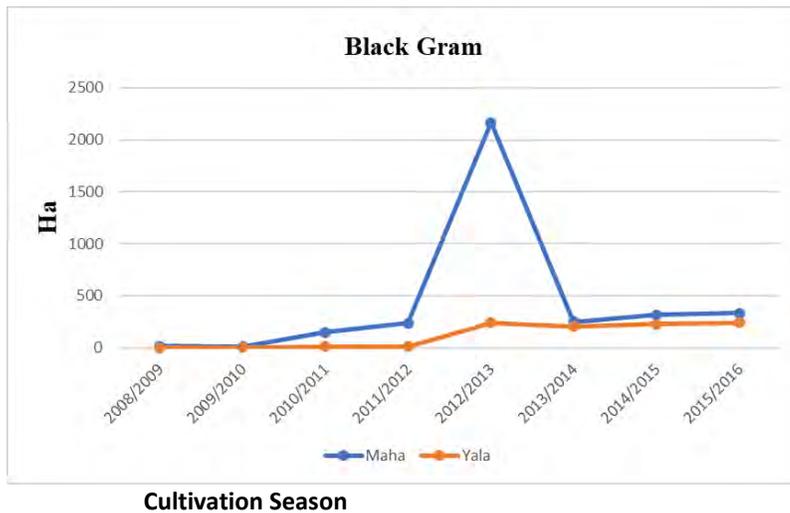
Figure 7.5 shows that the groundnut cultivation has shown an upward trend during the last eight years in both seasons.

### 7.5.3 Black gram Cultivation

**Table 7.7: Cultivation Extent of Black gram (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2008/2009	17	01
2009/2010	13	05
2010/2011	147	14
2011/2012	237	11
2012/2013	266	242
2013/2014	250	205
2014/2015	317	227
2015/2016	333	243

Source: Department of Census and Statistic



Source: Department of Census and Statistics

**Figure 7.6: Black gram Cultivation in Mannar District**

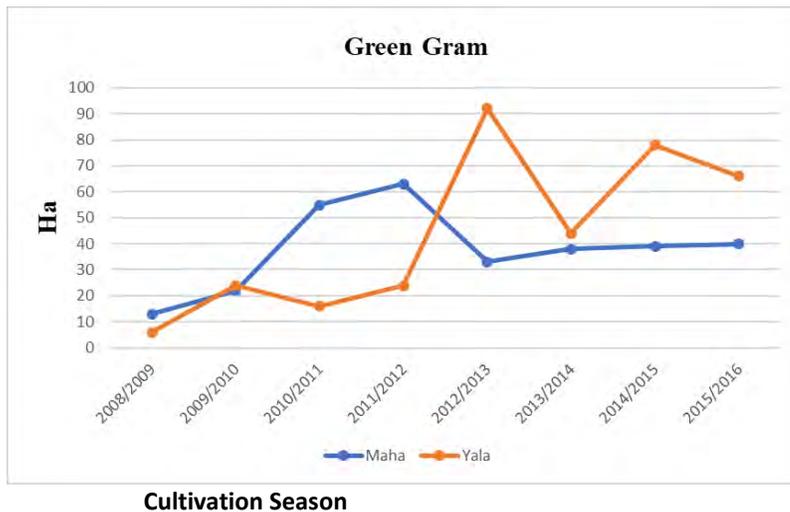
Figure 7.6 shows the data of the black gram cultivation in Mannar district. After 2011/2012 the black gram cultivation had shown a rapid increase in the *Maha* season. There is a steady flow of black gram cultivation in the *Yala* season.

#### 7.5.4 Green gram Cultivation

**Table 7.8: Cultivation Extent of Green gram (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2008/2009	13	06
2009/2010	22	24
2010/2011	55	16
2011/2012	63	24
2012/2013	33	92
2013/2014	38	44
2014/2015	39	78
2015/2016	40	66

Source: Department of Census and Statistics



Source: Department of Census and Statistics

**Figure 7.7: Green gram Cultivation in Mannar District**

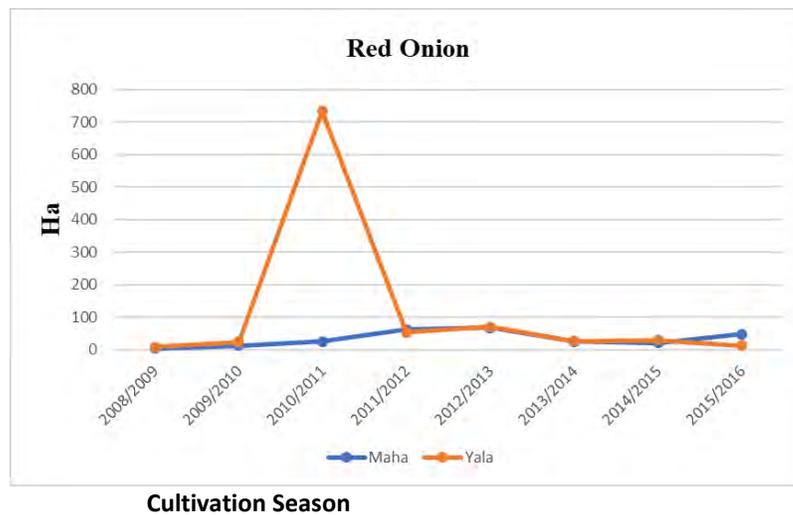
Figure 7.7 shows that the green gram cultivation was fluctuating during the last eight years in both the *Yala* and the *Maha* seasons but during the last four years in the *Maha* season a steady condition was observed. There is a fluctuation of green gram cultivation after the peak in the *Yala* season.

### 7.5.5 Red onion Cultivation

**Table 7.9: Cultivation Extent of Red onion. (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2008/2009	04	08
2009/2010	12	24
2010/2011	25	73
2011/2012	62	53
2012/2013	68	70
2013/2014	25	27
2014/2015	21	29
2015/2016	48	12

Source: Department of Census and Statistics



Source: Department of Census and Statistics

**Figure 7.8: Red onion Cultivation in Mannar District**

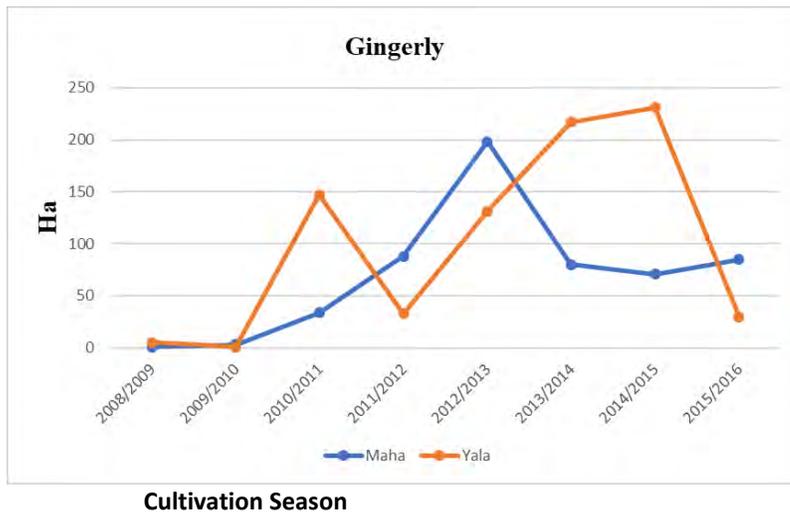
During the last eight years the red onion cultivation in both seasons shows an equal pattern but it diverges between the years 2009/2010 and 2011/2012 (Figure.7.8)

### 7.5.6 Gingerly Cultivation

**Table 7.10: Cultivation Extent of Gingerly (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2008/2009	01	05
2009/2010	03	01
2010/2011	34	147
2011/2012	88	33
2012/2013	198	131
2013/2014	80	217
2014/2015	71	231
2015/2016	85	30

Source: Department of Census and Statistics



Source: Department of Census and Statistics

**Figure 7.9: Gingerly Cultivation in Mannar District**

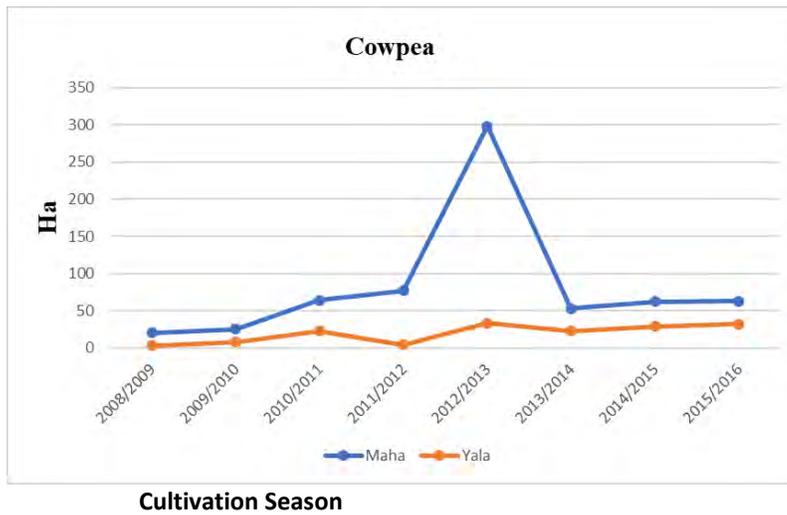
During the last eight years extent of gingerly cultivation was fluctuating. But in the last year *Yala* season the extent shows an unexpected reduction.

### 7.5.7 Cowpea Cultivation

**Table 7.11: Cultivation Extent of Cowpea (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2008/2009	20	03
2009/2010	25	08
2010/2011	64	23
2011/2012	77	04
2012/2013	98	33
2013/2014	53	23
2014/2015	62	29
2015/2016	63	32

Source: Department of Census and Statistics



Source: Department of Census and Statistics

**Figure 7.10: Cowpea Cultivation in Mannar District**

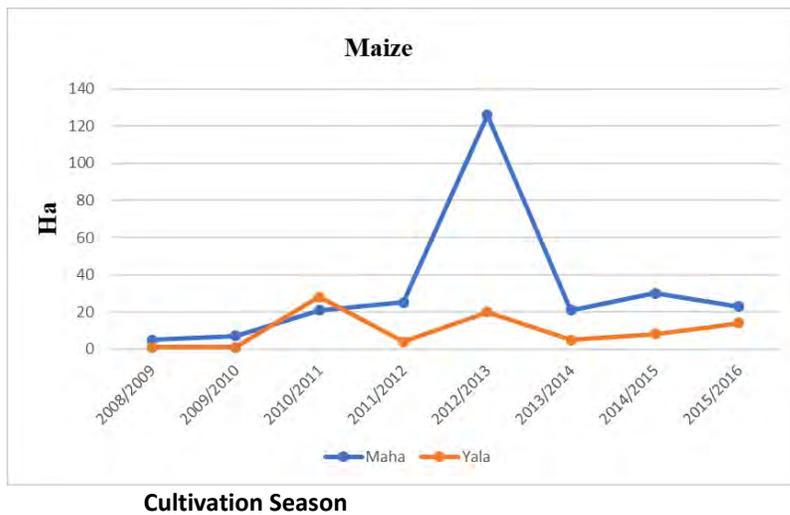
During the last eight years the cowpea cultivation in both the *Yala* and the *Maha* season shows an equal pattern but, it diverges between the years of 2011/2012 and 2013/2014.

### 7.5.8 Maize Cultivation

**Table 7.12: Cultivation Extent of Maize (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2008/2009	05	01
2009/2010	07	01
2010/2011	21	28
2011/2012	25	04
2012/2013	26	20
2013/2014	21	05
2014/2015	30	08
2015/2016	23	14

Source: Department of Census and Statistics



Source: Department of Census and Statistics

**Figure 7.11: Maize Cultivation in Mannar District**

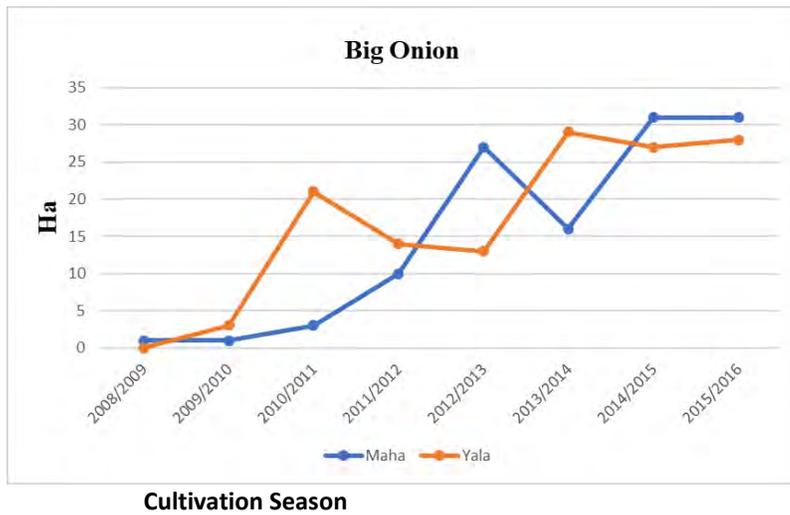
During the last eight years the maize cultivation in both the *Yala* and the *Maha* season shows an equal pattern. (Figure 7.11)

### 7.5.9 Big onion Cultivation

**Table 7.13: Cultivation Extent of Big onion (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2008/2009	01	-
2009/2010	01	03
2010/2011	03	21
2011/2012	10	14
2012/2013	27	13
203/2014	16	29
2014/2015	31	27
2015/2016	31	28

Source: Department of Census and Statistics



Source: Department of Census and Statistics

**Figure 7.12: Big onion Cultivation in Mannar District**

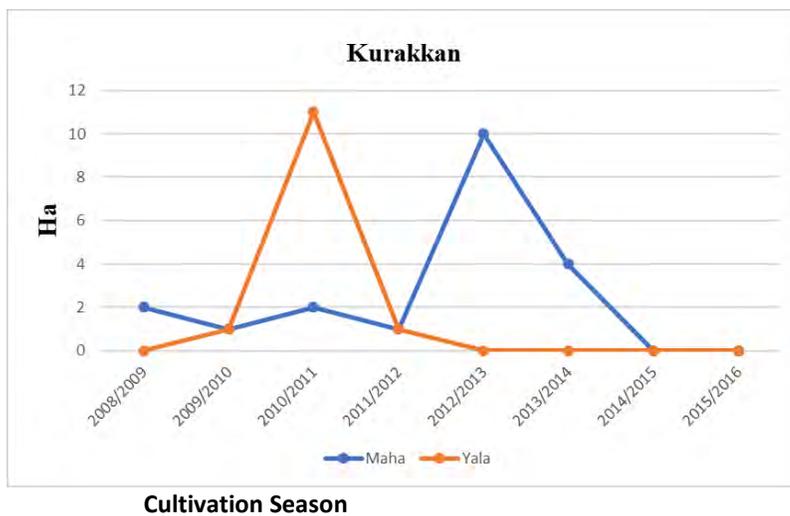
According to Figure 7.12 the cultivation in both the *Yala* and the *Maha* season was constant in the last two years. But a fluctuation can be seen in the *Yala* and the *Maha* seasons in other years.

### 7.5.10 Kurakkan

**Table 7.14: Cultivation Extent of Kurakkan (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2008/2009	02	-
2009/2010	01	01
2010/2011	02	11
2011/2012	01	01
2012/2013	10	-
2013/2014	04	-
2014/2015	-	-
2015/2016	-	-

Source: Department of Census and Statistics



Source: Department of Census and Statistics

**Figure 7.13: Kurakkan Cultivation in Mannar District**

Figure 7.13 shows that a considerable extent of Kurakkan cultivation has recorded an increase in the year of 2010/2011 *Yala* and in 2012/ 2013 *Maha* seasons respectively.

## 7.6 Cost of Cultivation

Tables 7.15 and 7.16, show the seed requirement, average cost of cultivation, revenue and profit for particular crops in last *Maha* and *Yala* seasons of 2015. Data was gathered through the focus group discussion with the farmers. Here imputed cost is not included. Black gram, Green gram, groundnut and green chilli are the major crops in Mannar.

**Table 7.15: Farmer Views of Seed Requirement per an Acre in Mannar district**

<b>Crop</b>	<b>Seed requirement for an acre</b>	<b>Average last season seed price-(2015-maha)</b>	<b>Method of cultivation</b>
Black gram	Average 10-12 kg	<ul style="list-style-type: none"> <li>• Private Trader - Rs250 to Rs350(Per/Kg)</li> <li>• ADC- Rs110 to Rs 180</li> </ul>	Broadcasting
Green gram	Average 10-12 kg	<ul style="list-style-type: none"> <li>• Private Trader – Rs180 to Rs250(Per/Kg)</li> </ul>	Broadcasting
Cowpea	Average 10-12 kg	<ul style="list-style-type: none"> <li>• Private Trader - Rs200 to Rs300(Per/Kg)</li> </ul>	Broadcasting
Groundnut	Average 40-50kg	<ul style="list-style-type: none"> <li>• Private Trader – Rs 9000 to Rs 10000 (50Kg)</li> </ul>	Manual line method
Chilli	4000 plant-500g/seeds	<ul style="list-style-type: none"> <li>• Ka-2 , 100g is around Rs 750.00</li> </ul>	Nursery and transplanting
Red onion	Average 40-50 Kg	<ul style="list-style-type: none"> <li>• Private Trader-Rs 9000 to Rs10000</li> </ul>	Nursery

Source: Field Survey-2016

**Table No 7.16: Cost of Cultivation**

<b>Crop</b>	<b>Cost of Cultivation (Rs)</b>	<b>Revenue (Rs)</b>	<b>Profit (Rs)</b>
Groundnut	Average cost Rs 50,000.00 (Maha)-Rainfed	(9000 * 14 bags(Avg)) =Rs 126,000.00	Rs 76,000.00
	Average cost Rs 80,000.00 (Yala)-Agro wells	( 9000* 19 bags (Avg)) =Rs 171,000.00	Rs 91,000.00
Big onion	Average cost Rs 60,000(Maha) Rainfed		Rs 29,000.00
Green gram	Average cost Rs 48000 (Maha)	150*450 kg =Rs 67,500.00	Rs 20,000.00

Source: Field Survey-2016

## 7.7 Problem Analysis with Farmers

### 7.7.1 Identification of the Problems

Data from the farmers was collected in each Agrarian Development Centre area in Mannar district. Table 7.17 shows the Agrarian Development Centre, the villages and type of villages, and the number of farmers who participated and their major problems.

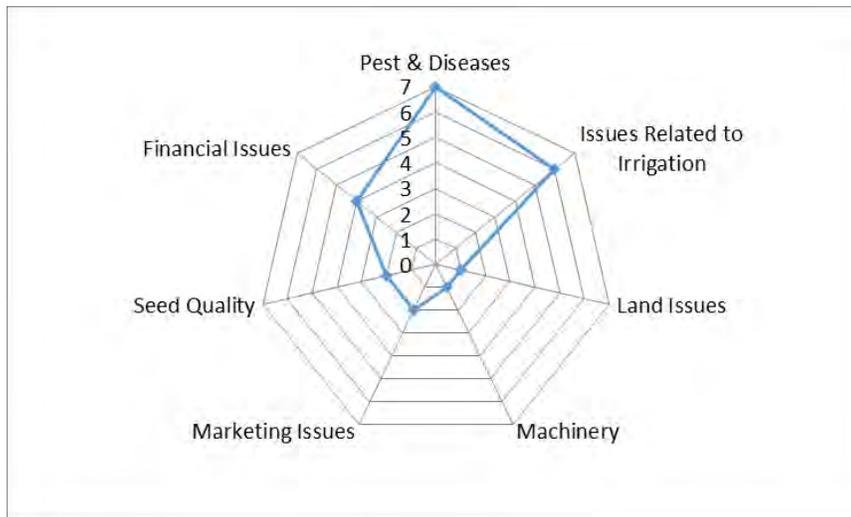
**Table 7.17: Problems Emerged in the Discussions in each A.D.C.**

Agrarian Service Centres Area	The Visited Village	Type of Village	Farmer Participation	Problem-1
Uyilankulam	Uyilankulam	T	07	<ul style="list-style-type: none"> <li>Financial problems</li> <li>Water scarcity</li> <li>Animal problems</li> </ul>
Manthai	Manthai West	T		<ul style="list-style-type: none"> <li>Financial problems</li> <li>Water scarcity</li> <li>Animal problems</li> </ul>
	Puliyankulam	T	12	
Alkaddively	Vaddakandan		12	<ul style="list-style-type: none"> <li>Marketing issue</li> <li>Machinery</li> <li>Seed issue</li> </ul>
Iranaiilupaikulam	Vanjjankulam	T	8	<ul style="list-style-type: none"> <li>Financial problems</li> <li>Water scarcity</li> <li>Animal problem</li> </ul>
P.P Potkerny	Sagayaveethi	T	10	<ul style="list-style-type: none"> <li>Financial problems</li> <li>Agricultural policies</li> </ul>
Nanaddan	Periyamurippu	C	15	<ul style="list-style-type: none"> <li>Animal issues</li> <li>Water scarcity</li> <li>Marketing</li> </ul>
	Vansiyankulam			
Murunkan	kal kidanthakulam	T	15	<ul style="list-style-type: none"> <li>Animal issue</li> <li>Seed issue</li> </ul>
Palampiddy	Palampiddy	T	10	<ul style="list-style-type: none"> <li>Animal issues</li> <li>Water scarcity</li> <li>Marketing</li> </ul>
Chilawaturai	Palakuli	C	15	<ul style="list-style-type: none"> <li>Water problem</li> <li>Land issues</li> <li>Animal problems</li> </ul>
	Hoonenagar	C	15	

Source: HARTI, Field Survey-2016

### 7.7.2 Problem Analysis in the District of Mannar

The main problem that can be identified in the district of Mannar according to the field survey is related to pests and diseases. The most pressing issues are yellow mosaic, root rot and anthracnose attacks among the crops of leguminosae family. The chilli farmers suffered crop damages due to other diseases such as leaf curl and root rot.



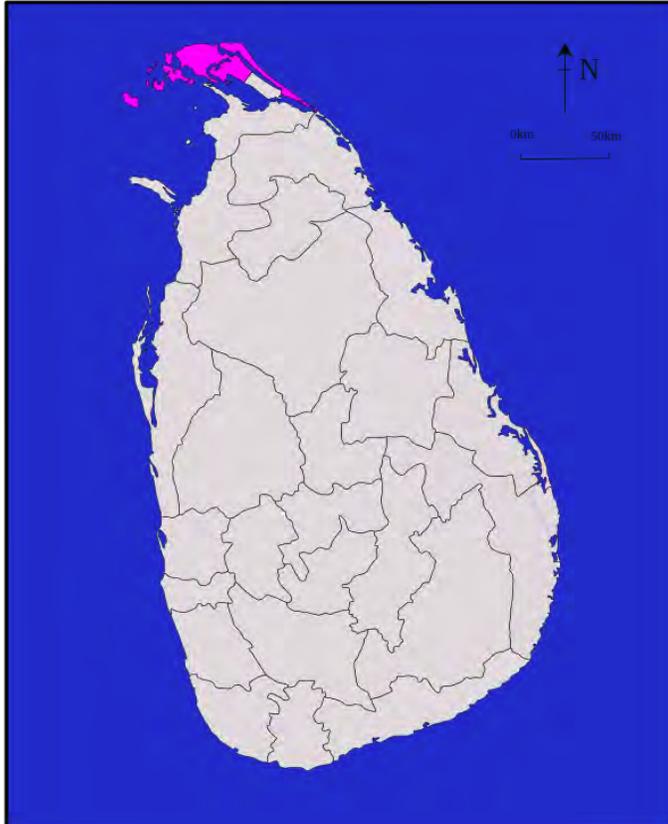
Source: Field Survey, 2016

**Figure 7.14: Problem Analysis - Mannar District**

## CHAPTER EIGHT

### Jaffna District

#### 8.1 Analysis of the OFC Sector in Jaffna District



Jaffna district is the Northern end of the Northern Province of Sri Lanka, about 410 km away from the capital city of Colombo. It consists of the peninsula and seven inhabited islands. (North, East and West boundaries of the district are the Indian Ocean, to the South is the Jaffna Lagoon and Kilinochchi District). The total land area including the island waters is 1,012.01 sq.km. Jaffna district is divided into four sub divisions: They are Island, Valikamam, Thenmaradchi and Vadamaradchi.

**Figure 8.1: Jaffna District**

There are 1,084 ponds and 2,433 ditches scattered all over the district with connected canals to conserve rain water. Excess water easily drains off into the sea/lagoon. Point Pedro 15.24m, Myliddy 10.8m, Chankanai 3.04 m and Kokuvil 6.09m respectively are above sea level. Population in the district in 2013 was 610,640 consisting of 186,681 families.

The female population is accounted for 52.31% of the total population. The ethnic distribution is 601,353 are Tamils, 355 and Sinhalese and 8,392 are Muslims. Of the population religionwise 83.23% are Hindus, 15.24 % Christians, 1.42% belonged to the Islam faith and 0.0046% were Buddhists.

Agriculture is the leading sector in the economy in the Jaffna district. About one third of the families in the district solely depend on agriculture, including livestock and fairly a large segment is also involved in home gardening. People in the district practice traditional farming and it's the mainstay of their culture and livelihood. These traditional farmers have had generations of experience about the soil, the climate and the farming practices unique to their system of production. These practices have been time tested and proven to be more appropriate than the new cultural practices. The farmers never had the opportunity to practice their most unique and effective farming technology during the past three decades which witnessed a disastrous war arising out of a communal issue which resulted in the loss of tens of thousands of lives and the inestimable loss to all aspects of the economy; social, economic educational, fisheries, livestock all came to a standstill and economy was in the doldrums. During the post - war decade the injection of doses of massive capital resulted in reconstruction, rehabilitation and renovation programmes which capacitated the people to lead their normal lives. It is predominantly an agricultural area and always has enormous potential for farming pursuits and red onion, chillies, potatoes, tobaccos, vegetables, banana and grapes are now cultivated on a market oriented basis. Other crops such as paddy, pulses, and coconut are grown to a considerable extent. Palmyrah products also provide the farmers with a substantial source of income. Rice is produced during the *Maha* season under rain fed conditions while vegetables are produced nearly all year round in the same conditions.

## 8.2 Extent of Other Field Crop Cultivated during *Maha* – 2014/15 and *Yala* Season in 2015

**Table 8.1: Cultivated Extent of Other Field Crops**

Crop	<i>Maha</i> (Ha)	<i>Yala</i> (Ha)
Red onion	-	678.79
Chilli	-	233.64
Black gram	65.61	28.64
Green gram	90.28	55.42
Groundnut	36.08	17.05
Cowpea	56.64	31.84
Kurakkan	134.42	120.18
Sesame	188.56	212.96

Source: District Secretariat Jaffna, 2016

## 8.3 Major Crops and Tank Details in Jaffna - 2015

Jaffna has a source of groundwater store in the sub terrain layer of limestone. The limestone is the main aquifer, which has several isolated caves and caverns capable of

storing groundwater without evaporation losses. The entire groundwater is generated from percolated rainfall and it forms freshwater lens underground. It is found that the fresh water lens do not extend below the base of the limestone. These lens are sustained by the buoyancy of fresh water in relation to sea water, (difference in density, (1.0,0.25) giving a ratio of (40:1). That means every meter of fresh water above the sea level requires a depth of fresh water lens of 40m when no mixing between fresh and seawater takes place. There is no sharp interface between fresh and seawater.

Water extracted from around 28,000 open dug wells serve both domestic and agricultural purposes. Water available in these wells and its quality varies from place to place. In the majority of deep wells in the Valikamam division water is available for irrigation throughout the year. These wells are situated in the calcic red-yellow latosols and their depths vary from 20 to 25 feet. The wells available in other areas are shallow (10 to 15 ft).

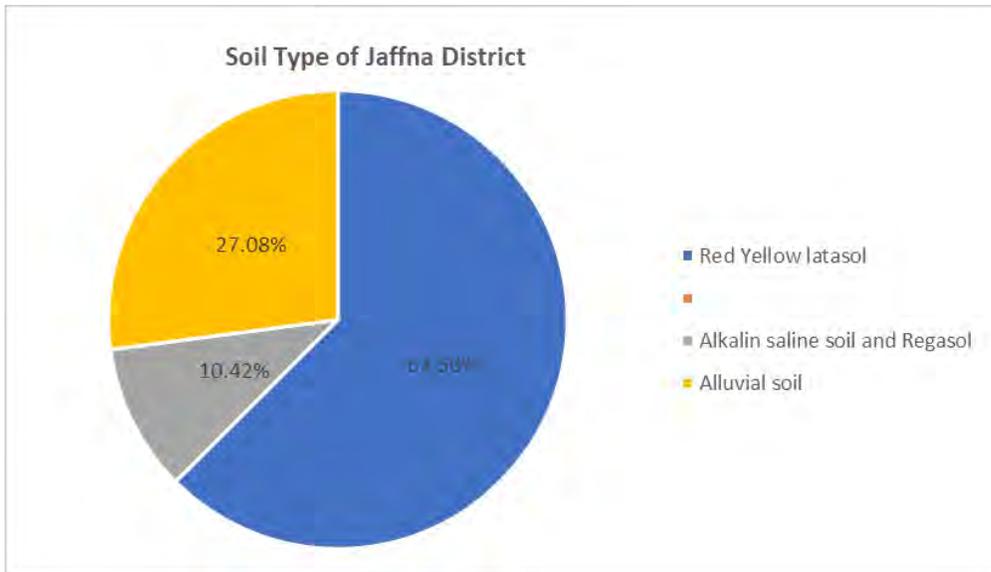
#### 8.4 Soil Type of Jaffna District (Estimated)

The soil and water resource of the Jaffna Peninsula are both related sediments of the limestone geology of the land. The soils are formed on the marine deposits and sediments under the influence of sea waves and wind on lime stones. Tile limestone being a porous rock is the source of groundwater for the Peninsula. Well drained and high productive calcic red yellow latasol and red yellow latasol soil types are found in central areas (60,000ha). Alkalin saline soil and regasol are found in coastal areas (26000ha) and alluvial soil is in Valukai Aru area (10000ha). In certain areas coral lime stone is available. These different soil types offer scope for cultivation of exotic as well as local crops. Tile depth of soil varies from 90cm - 150cm shows the main type of soil in the Jaffna district and its suitability for crop cultivation. Most of the types of soil (100%) are suitable for cultivation.

**Table 8.2: The Main Types of Soil in Jaffna District**

No	Soil Type	Percentage	Suitable Crop
1	Red Yellow latasol and Red Yellow latasol soil	62.5%	Rice, Onions, Groundnut, Sugarcane, Sunflower, Cotton, Timber tree, Chilli, Black gram, Green gram
2	Alkalin saline soil and Regasol	10.41667%	Rice, Maize, Groundnut, Sugarcane, Sunflower, Cotton
3	Alluvial soil	27.08333%	Rice, Maize, Groundnut, Sugarcane, Sunflower, Cotton
	<b>Total</b>	<b>100%</b>	

Source: Department of Agriculture (extension), Jaffna, 2015



Source: Annual Performance Report (2016), District Secretariat of Jaffna

**Figure 8.2: Soil Type of Jaffna**

### 8.5 Annual Rainfall in the Last 10 Years 2005-2015 (mm)

The climate of Jaffna is determined by the monsoon that forms a wet and dry season in the district. The major rainy season during the North east monsoons is from October to December and the minor rainy season occurs during the South west monsoon in April and May. The period between the South west monsoon and the North east monsoon is the dry season extending from June to September. The average rainfall is 1300mm but is highly variable, spanning from 630mm to 1780mm.

Jaffna depends on the underlying limestone aquifer for its water and the capacity of the aquifer was stretched to its limits. Some of the dug wells, the principal source for fresh water, went dry and many others became saline due to salt water intrusion. Table 8.3 shows the rainfall pattern in the last decade in the district. Table 8.3 shows an yearly upward trend in the rainfall.

**Table 8.3: Annual Rainfall Pattern**

Year	Annual Rainfall (mm)
2005	1235.3
2006	926.5
2007	1168.3
2008	1776.7
2009	869.2
2010	1496.5
2011	1470.7
2012	943.2
2013	1033.3
2014	1368.6
2015	1838.9

Source: Annual Performance Report, District Secretariat of Jaffna-2016

## 8.6 Crop-wise Extent of the OFC Cultivation in Jaffna

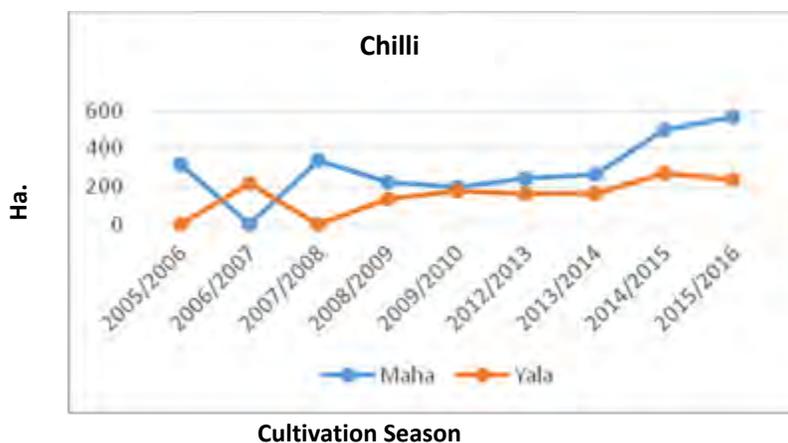
Tables and the graphs bellow depict the crop wise extent of cultivation in both the *Maha* and the *Yala* seasons.

### 8.6.1 Chilli Cultivation

**Table 8.4: Cultivation Extent of Chilli (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2005/2006	318	0
2006/2007	0	218
2007/2008	340	0
2008/2009	227	137
2009/2010	200	177
2012/2013	241	164
2013/2014	267	164
2014/2015	500	272
2015/2016	569	234

Source: Department of Census and Statistics



Source: Department of Census and Statistics

**Figure 8.3: Chilli Cultivation in Jaffna District**

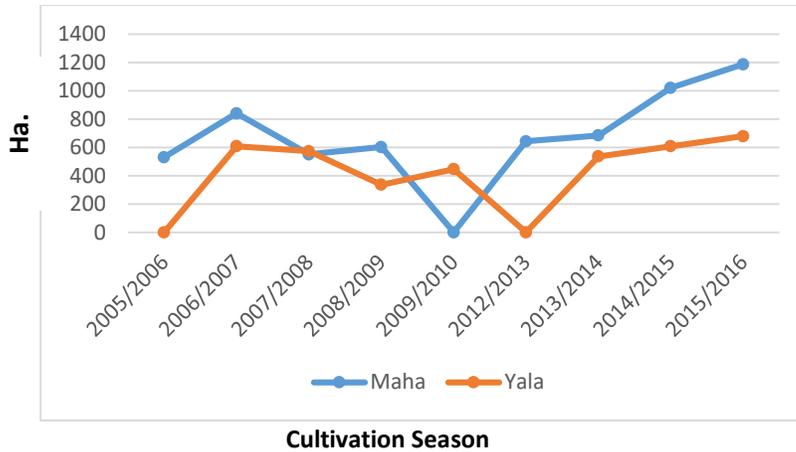
Since 2012 in the *Yala* seasons the extent of chilli cultivation has been increasing, same as during 2008 to 2015 in the *Maha* season. For 2010 to 2012 statistical data was not recorded.

### 8.6.2 Red onion Cultivation

**Table 8.5: Cultivation Extent of Red onion (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2005/2006	530	0
2006/2007	840	608
2007/2008	550	573
2008/2009	602	336
2009/2010	0	446
2012/2013	642	0
2013/2014	684	536
2014/2015	1020	608
2015/2016	1186	679

Source: Department of Census and Statistics



Source: Department of Census and Statistics

**Figure 8.4: Red onion Cultivation in Jaffna District**

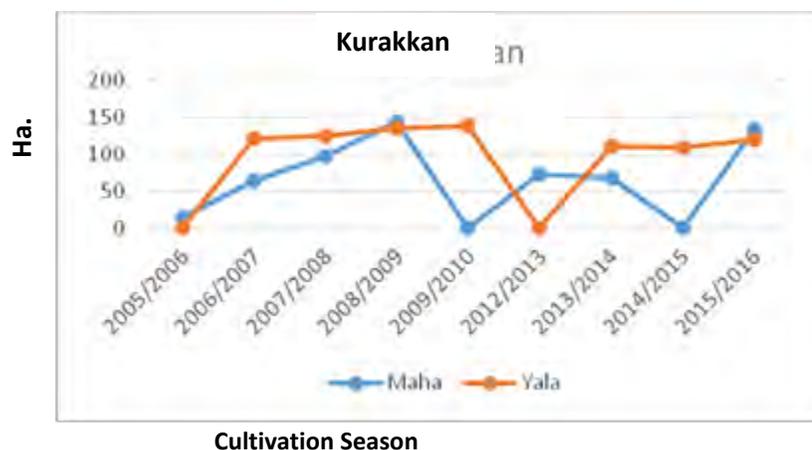
In the three years (2012/2013 to 2014/2015) the extent of red onion cultivation had marked an increase. Before that it was fluctuating. During 2010 to 2012, data was not recorded.

### 8.6.3 Kurakkan Cultivation

**Table 8.6: Cultivation Extent of Kurakkan (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2005/2006	15	0
2006/2007	65	122
2007/2008	97	125
2008/2009	144	136
2009/2010	0	138
2012/2013	73	0
2013/2014	68	111
2014/2015	0	109
2015/2016	134	120

Source: Department of Census and Statistics



Source: Department of Census and Statistics

**Figure 8.5: Kurakkan Cultivation in Jaffna District**

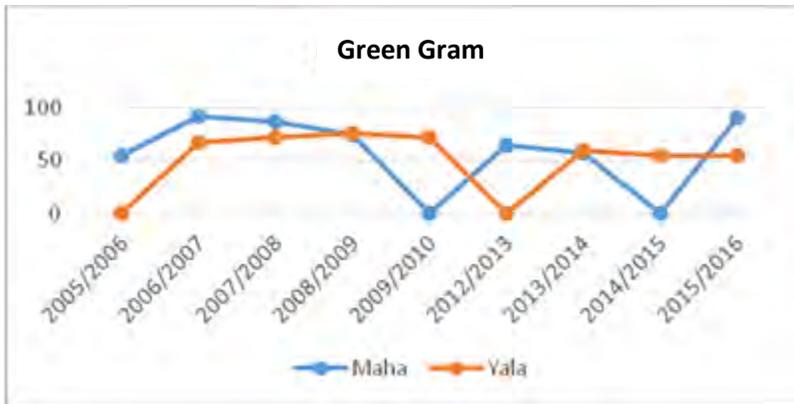
During 2010 to 2012, data on the extent of cultivation was not recorded. Otherwise the extent of cultivation had fluctuated in both seasons.

#### 8.6.4 Green gram Cultivation

**Table 8.7: Cultivation Extent of Green gram (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2005/2006	55	0
2006/2007	92	67
2007/2008	87	72
2008/2009	74	76
2009/2010	0	72
2012/2013	65	0
2013/2014	57	59
2014/2015	0	55
2015/2016	90	55

Source: Department of Census and Statistics



Cultivation Season

Source: Department of Census and Statistics

**Figure 8.6: Green gram Cultivation in Jaffna District**

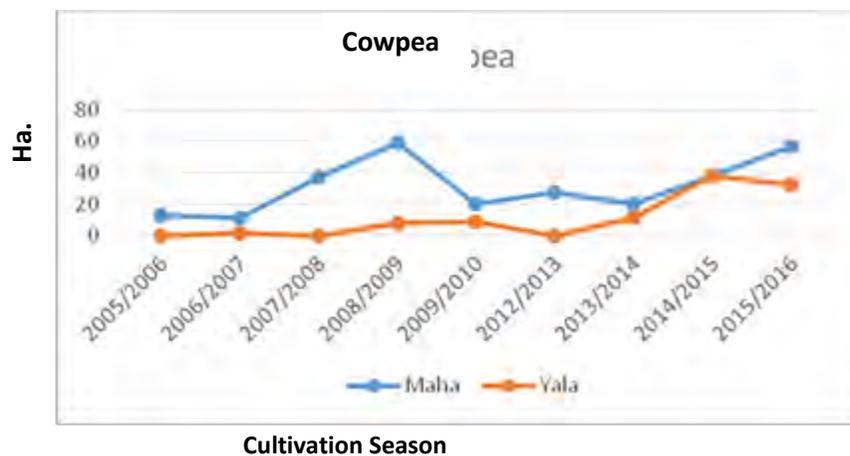
Extent of cultivation had slowly dropped in both seasons.

### 8.6.5 Cowpea Cultivation

**Table 8.8: Cultivation Extent of Cowpea (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2005/2006	13	0
2006/2007	11	1
2007/2008	37	0
2008/2009	59	8
2009/2010	20	9
2012/2013	27	0
2013/2014	20	11
2014/2015	38	38
2015/2016	57	32

Source: Department of Census and Statistics



Source: Department of Census and Statistics

**Figure 8.7: Cowpea Cultivation in Jaffna District**

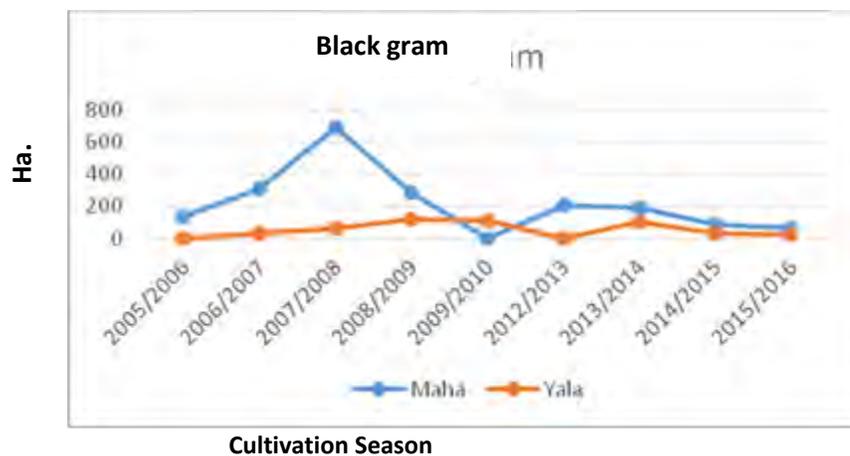
In the two years (2013/2014 and 2014 /2015) extent of cultivation had increased. Before that in the *Yala* season cowpea was rarely cultivated. In 2008 *Maha* season the extent had shown an increase.

### 8.6.6 Black gram Cultivation

**Table 8.9: Cultivation Extent of Black gram (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2005/2006	132	0
2006/2007	309	32
2007/2008	693	62
2008/2009	287	120
2009/2010	0	111
2012/2013	208	0
2013/2014	190	106
2014/2015	87	30
2015/2016	66	25

Source: Department of Census and Statistics



Source: Department of Census and Statistics

**Figure 8.8: Black gram Cultivation in Jaffna District**

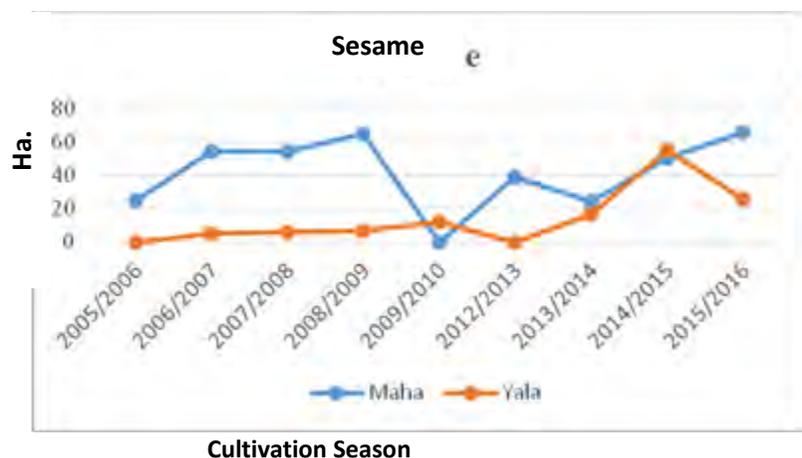
Extent of Black gram cultivation was more than that of other OFCs but it was fluctuating. Data of 2010 to 2012 was not recorded.

### 8.6.7 Sesame Cultivation

**Table 8.10: Cultivation Extent of Sesame (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2005/2006	25	0
2006/2007	54	5
2007/2008	54	6
2008/2009	65	7
2009/2010	0	12
2012/2013	39	0
2013/2014	24	17
2014/2015	50	55
2015/2016	66	26

Source: Department of Census and Statistics



Source: Department of Census and Statistics

**Figure 8.9: Sesame Cultivation in Jaffna District**

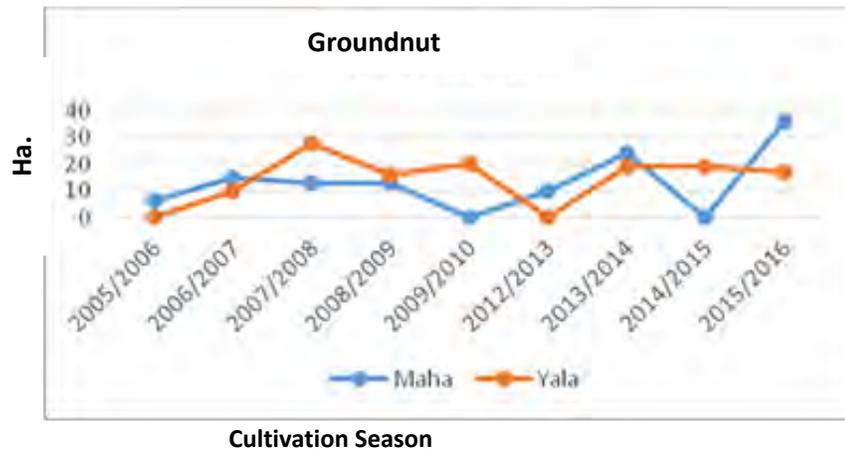
During the years (2013/2014 and 2014/2015) sesame cultivation had increased in the *Maha* season. But before that it was also fluctuating. In the *Yala* season the extent of cultivation had an increase but in 2015-2016 it had dropped.

### 8.6.8 Groundnut Cultivation

**Table 8.11: Cultivation Extent of Groundnut (ha)**

Year	<i>Maha</i>	<i>Yala</i>
2005/2006	6	0
2006/2007	15	10
2007/2008	13	28
2008/2009	13	16
2009/2010	0	20
2012/2013	10	0
2013/2014	24	19
2014/2015	0	19
2015/2016	36	17

Source: Department of Census and Statistics



Source: Department of Census and Statistics

**Figure 8.10: Groundnut Cultivation in Jaffna District**

Extent of groundnut cultivation has fluctuated with no drastic ups or downs.

## 8.7 Problem Analysis with Farmers

### 8.7.1 Identification of the Problems

Data was gathered from farmers in each Agrarian Development Centre area in the Jaffna district. Table below presents the major problems encountered in respective Agrarian Development Centre and other relevant information.

**Table 8.12: Problem Emerged in the Discussions**

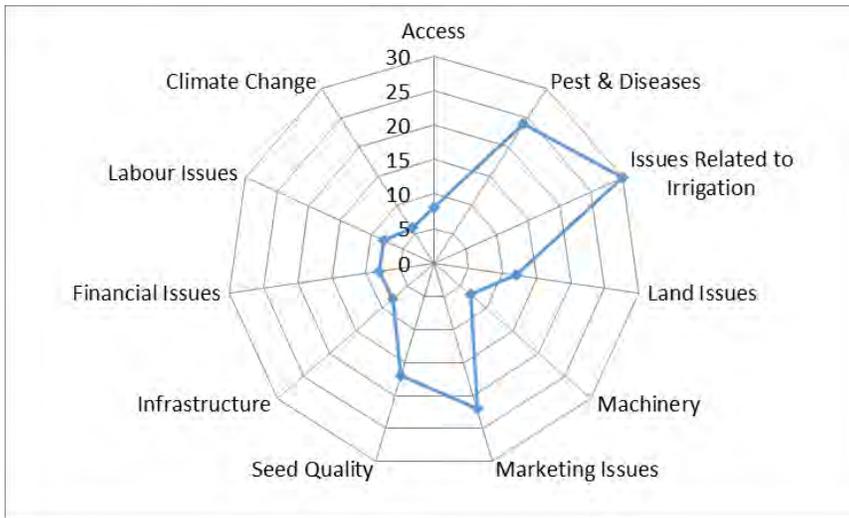
<b>Agrarian Service Centres</b>	<b>The visited village</b>	<b>Type of village</b>	<b>Farmer participation</b>	<b>Problem-1</b>
Karaveddy	1. Karanavai- South	T	12	<ul style="list-style-type: none"> <li>• Weeds problem</li> <li>• Labour &amp; labour cost</li> <li>• Marketing issues</li> <li>• Bank loans</li> <li>• Climate change (government not concerned)</li> </ul>
	2. Karanavai – South	T	09	
Urumpirai	1. Urumpirai – West	T	11	<ul style="list-style-type: none"> <li>• Labour problem</li> <li>• Quality of seeds</li> <li>• Marketing issues</li> <li>• Financial issues</li> <li>• Transport issues (road)</li> <li>• APC machinery problem</li> </ul>
	2. Koppai	T	12	
Thollpuram	1.Thollpuram	T	05	<ul style="list-style-type: none"> <li>• Irrigation issue (salty water)</li> <li>• Climate change</li> <li>• Quality of seeds</li> <li>• Marketing issues</li> <li>• Animals problem</li> </ul>
Idaikkadu	1. Idaikaadu	T	08	<ul style="list-style-type: none"> <li>• Climate change</li> <li>• Marketing issues</li> <li>• Labour issues</li> <li>• Chemical quality problem</li> <li>• Seeds quality problem</li> </ul>
Pulloly	1. Pulloly	T	07	<ul style="list-style-type: none"> <li>• Irrigation issue (not enough agro wells and dug wells)</li> <li>• Animal problem</li> <li>• Quality of seeds</li> <li>• Weeds problem</li> <li>• Marketing issues</li> </ul>

Source: Field survey - 2016

### 8.7.2 Problems Analysis – Jaffna District

The unexpected climate scenarios such as severe floods and prolonged droughts during the recent times resulted in a significant yield loss in Jaffna district and the lack of awareness among the farmers of crop insurance deprived them of the benefits they could have accrued for their crop losses.

This situation created a serious snag for the farmers accessing to compensation for their crop losses which in turn impacted disastrously on the pursuit of their farming activities in the next season.



Source: Field survey, 2016

**Figure 8.11: Problem Analysis, Jaffna District**



## CHAPTER NINE

### Problem Analysis: Northern Province

#### 9.1 Farmers' Perspective

##### 9.1.1 Land Issues

- Land partition: Fragmentation of the land from generation to generation from parents to off springs has resulted in dwindling land size.
- Farm Lands acquired by the Forest Department: -

Farmers who had lost their lands during the three decade war found, on their return at the end of the war, that wilderness had covered their lands. The Forest Department had refused permission to clear the land for farming, despite the permits or deeds of ownership the farmers had. The situation remained unchanged, impacting even the chena (shifting) cultivation.

- Farmers do not possess the required know – how to improve land productivity.
- Most of the farmers need to renew their permits.
- Some of the land extents are still under the control of state defence forces.
- Drop in the fertility level because of continued cultivation of the same land, with a mono crop.

##### **Impact:**

A tendency to give up cultivation for want of land and government restriction on chena cultivation.

- Because of land scarcity youth wean away from farming and a shortage of farmers and farm products loom large.

##### 9.1.2 Irrigation Issues

##### **Water Scarcity:**

- Lowering tank capacities due to loads of sediment and siltation.
- Paucity of agro wells for irrigation; about 75% of the wells have to be deepened for more water.
- In most of the areas farmers build sand wells but they are not properly constructed. These wells had to be renovated every year at a sizeable cost and this exercise either reduce their cultivable land extent or the farmers are forced to look for other means of livelihood.

**Irrigation methods:**

- Farmers follow traditional irrigation methods, worsening the water wastage and scarcity issues.
- Farmers claimed that in certain areas irrigation tanks were renovated but canals were not properly done.
- According to the researchers' observations some farmers have new irrigation (sprinkler, drip) systems but not put into proper use because of their unawareness of the system.

**Impact**

- Wrong irrigation methods and water scarcity have given rise to certain diseases such as wilting and rootrot condition.
- Most of their current irrigation systems cause more water wastage.

**9.1.3 Tools and Resources*****Seeds & Seeding Issue:***

- In the planting times seeds are scarce. The ADC (Agrarian Development Centre) provides seeds at subsidized rates only for a selected few farmers and only 10 kg (Black gram) of seeds can be bought by a farmer. So others are unable to get quality seeds. The farmers said that the ADC seeds were of good quality. The farmers are seriously concerned about the long-time taken by the ADC to process the farmers' applications. The implications are changes in cultivation patterns, lower yields and additional costs.
- Farmers buy seeds from private traders (CIC, Heyles, other farmers) but the quality is low (Quality – germination, purity,) and the price is higher.
- Many farmers use their own seeds (previous year product/yield). but they think that productivity is lesser and they look for hybrid seeds, which are hard to get at in the Northern Province.
- A few seeding machines are available in some areas in the Province but not enough for all. Some seeding machine users complained that the machines were damaged and they were reluctant to use them.

#### **9.1.4 Land Preparation and Equipment Issues**

- Some ADC (Agriculture Development Centres) have machines but they are not in the working conditions. The poor farmers cannot afford to hire private tractors since the hiring charges are unbearable.
- Most farmers do not have much knowledge in operating tractors and other machines so they hire labour for high wages.

##### **Impact:**

- As the seeds did not properly germinate the farmers failed to get the expected yield.
- Those who follow line method for sowing get higher yields than their counterparts who use the broadcasting method. Line method requires lesser seeds.

#### **9.1.5 Labour and Other Issues**

- In the Northern Province in many areas getting farm hands with agriculture related experience is a problem. Hiring labour at a high rate is an impossibility.
- Farmers are mostly used to traditional (manual) methods of cultivation and harvesting in OFC cultivation which is labour intensive. Also farmers do not use machinery for weed control and other farming operations. They prefer practise self-dependent cultivation.

##### **Impact:**

- It transpired that soaring cost of cultivation had forced the farmers to go for smaller plots of land and in particular OFC cultivation was labour – intensive. For this reason, OFC cultivators mostly manage to depend on family labour. The situation has turned to worse since state intervention had not been forthcoming in the provision of machinery. Particularly for harvesting, specially so in the case of Green gram and groundnut. Hence in the cost structure the labour component needs to be addressed seriously.

#### **9.1.6 Pests and Disease Challenges**

In the Northern Province another major problem that plagues the farmers causing a substantial loss in yields is the pests and disease attacks. This challenge arises mainly due to climate change and off seasonal cultivation. Particularly during the post-harvest period.

- It was also revealed that some agriculture instructors (AIs) who were vested with the responsibility of dealing with these pest and disease attacks had not been able to make out the diseases for necessary action.

**Impact:**

- Poor knowledge about pest and diseases, which prevented the farmers from getting better yields.
- Tendency to give up some crop cultivation because of pest and disease attacks.
- Some farmers despite having knowledge of organic solutions did not follow it.

**Table 9.1: Identified Diseases**

<b>Crops</b>	<b>Diseases</b>	<b>Farmer controlling methods</b>
Black gram	1. Yellow mosaic (Mostly affected last year in 2015) 2. Root rot 3. Anthracnose	Chemical and some farmers using organic control (Neem oil and cow urine)
Green gram	1. Yellow mosaic (Mostly affected last year in 2015) 2. Root rot 3. Anthracnose	Chemical and some farmer using organic control (Neem oil and cow urine)
Groundnut	1. Root rot	Chemical
Chilli	1. Leaf curled 2. Root rot (rainy season)	Chemical and Organic method (Neem oil)
Red onion	1. Slippery skin 2. Root rot	Chemical
Cowpea	1. Yellow mosaic (Mostly affected last year in 2015) 2. Root rot 3. Anthracnose	Chemical

Source: Field Survey-2016

The unexpected climate scenarios such as severe floods and prolonged droughts during the recent times resulted in a significant yield loss to the farmers in the Jaffna district and the lack of awareness among the farmers of crop insurance schemes and related regulations created a serious snag for the farmers expecting compensation for their crop losses which in turn impacted disastrously in the pursuit of their farming activities in the next season.

### **9.1.7 Marketing Issues**

#### ***High share of imported products:***

- Sri Lanka imports huge quantities of OFC products at a cheaper price. The demand for local products dwindle.

#### ***Lack of marketing knowledge:***

- According to our observations most of the farmers' awareness of marketing is poor. So they are unable to compete with the traders or with other consumers.

#### ***Low marketing opportunity leads to low price:***

- In the harvesting season supply is high but demand is stable resulting in a drop in price. Hence farmers are unable to bear this situation. (at times earning is lesser than the cost of cultivation)

#### ***Financial barriers:***

- Most farmers invest in cultivation by getting loans. In harvesting time, they have to settle their loan, labour charges, machinery rent and other related charges and they dispose of their yield at harvesting time but not at a reasonable price.

#### ***Value added products:***

- Low share of on-farm processed production results in forcing the farmers to dispose of their products at a cheaper rate. "this value added activity depends on farmer turned entrepreneur." (Invest money, opportunity identification and risk taking)

#### ***Storing facility:***

- In Vavuniya, farmers did not have any better storage either personal or government – owned for OFC products. Also farmers' knowledge about storing and related matters was less (Some farmers have a good knowledge about storing but do not put in to practice)

#### ***Traders and commissions:***

- In the Northern Province the traders are not much concerned about purchasing OFC products from the farmer and they capitalize on the lower bargaining power of the farmer. Also traders take 10% of commission when they do purchasing.
- The government does not have proper OFC purchasing programmes in the harvesting period and the private traders exploit the situation and determine the price. (Now private trader follows syndicate mechanism to buy farmer products)

### **Impact from the issues**

- Due to importation, farmers fail to fetch good price for their yield. So the farmers diversify with vegetable and fruit cultivation, which brings them a better income.
- Due to lack of marketing knowledge they depend on intermediaries to sell their yield at lower prices.
- Most of the farmers are poor and they borrow money and pawn jewellery to get the capital for cultivation and at harvesting time they immediately sell their yield to settle the loans. This situation does not allow them to store their yield till they get a better price.
- They do not have enough knowledge and financial capacity to do value added processes.
- Farmers do not have enough facilities to store their yield, forcing them to sell their yield immediately after harvesting.

#### **9.1.8 Credit and Indebtedness**

- Farmers need credit for both consumption and investment purposes. Increasing indebtedness prompt them to go for more credit. Banks follow some restrictions to sanction loans due to indebtedness.
- In some areas farmer banks do function properly.

### **Impact from this issue**

- The government banks insist on surety for offering loans and the farmers depend on private sources at higher interest rates.
- Sometime farmers give up cultivation due to poverty.

#### **9.1.9 Issues of Climate Change**

"Climate change" means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods. (United Nations, 1992)

- Climate change is a major challenge for the agriculture. The OFC farmers do not have enough knowledge about climate change. But they observe the pattern of rain and commence their cultivations.

### **Impact from this issue**

- Some farmers insure their cultivation. When cultivation is destroyed due to climate change or other acceptable reasons they apply for compensation but the insurance companies hold off the farmers' claims in the first instance and even in their second attempt these companies disappoint the farmers by giving such lame excuses as their applications are late for indemnifying. The farmers' view is that even in the case of the Department of Agriculture which persists on the farmers to get insurance when they receive subsidies, it is not seriously concerned about the farmers' claims for indemnification.

#### **9.1.10 Low Social Image of Farmers**

Some of the farmers are perturbed that they are being pushed into a lower strata of the society in preference to the educated and the employed. One instance of this social injustice and prejudice is that specially in marital affairs priority is always for those educated/employed. This is a disincentive for the farmers and the younger generation too, hence they prefer to go for other occupations with job security.

### **Impact from this issue**

This reason leads the farmer to think about quit farming.

It was brought into light that even in educational institutes the students are encouraged to opt for other subjects than those in the agriculture streams.

#### **9.1.11 Animal Damages**

- According to the farmers' statements, monkeys, elephants, pigs, peacocks and cattle damage the cultivations causing a heavy loss of income to the farmer annually.

#### **9.1.12 Short Term Government Policies**

- According to the farmers' view, the government does not provide any incentives to improve the OFC cultivation. Farmers said that the government implements development programmes for paddy cultivation only. The farmers are of the view that inclusive programmes of agriculture, both short term and mid-term are of pivotal significance.

### **Impact from this issue**

- Farmers need time to adapt to a policy, when the government adopts changes of policies.

## **9.2 Problems Related to Agriculture Instructors and Other Related Officers**

- A need exists for more AIs to cover more families in certain extension areas. In certain instances, heavy workload forces them to quit their jobs.
- The Department of Agriculture issues limited resources (subsidies, seeds, machinery) and AIs are unable to distribute them among all farmers. It causes misunderstanding between the farmers and the AIs.
- The Department issues resources at 50 % subsidy rate but farmers are unable to buy it. They are ready to buy these resources on an easy instalment method (EMI).
- Scarcity of higher level officers and field level officers in the sector.
- Shortage of staff impedes the provision of a better service for the farmer community.

## **9.3 Problems Associated with Traders**

Traders buy very small quantity of local OFC products, because:

- imported OFC products can be stored for more than 11-12 months without being affected by pest. But the local products can resist such attacks only for a couple of months.
- imported OFC products look good, clean, same size and without damaged grains, or stones. So the consumers prefer these products.

## **9.4 Solutions Based on Farmers' Views**

### **9.4.1 Land**

- The farmers propose the government to release their own land (Now owned by the Forest Department and the defence forces) and to provide them with new land with deeds.
- To introduce/ arrange training to teach new cultivation methods to increase the yield.
- To release the land to practise chena cultivation.
- They request the ADC to hand over the tractors to the farmer organizations. Most of the tractors which belong to the ADC office are not in a usable condition but the farmers opine that if the farmer organizations can have them, farmers would be able to do the needful and maintain them in running conditions.

- Now they follow a monopolistic competitive market system (traders fix the price). A liberalized market system is preferred to fix prices by themselves for their products. Training on storing mechanism and introducing storage facilities are needed.
- To improve post-harvest management such facilities as training and extension for OFC products are of crucial significance. A minimum support price for products or a government purchasing scheme should be set up.
- There is a need for promoting value added services to up the demand for OFC product.
- State banks insist on stricter sureties to offer loans whereas some of the private financial companies offer loans at high interest rates, but with lesser procedural implications. With no awareness of financial management, the farmers depend on their loans but find themselves in the plight of inability to redeem their loans. Intervention is necessary to provide relief in this context.

#### **9.4.7 Credit and Indebtedness**

- The need for a state bank loan scheme with minimum surety or on a surety offered by the farmer organizations or on a recommendation by the AIs.

#### **9.4.8 Climate Change**

- Farmers are unconcerned about climate change and adapt themselves to the changes in the weather pattern.

#### **9.4.9 Low Social Image of Farmers**

- They expect the government to encourage the students to follow the subject areas in the agriculture stream.

#### **9.4.10 Animal Damages**

- The need for electric fences or resettling the elephants in habitats in forest areas.
- A system to issue guns for the farmers to save their crops from the heavy damages caused by monkeys.
- Stray cattle are a menace to the farmers who need posts, cables, logs and permission to cut down trees for logs to put up fences around their farm lands.

## **9.5 Innovative Ideas from Farmers**

- To encourage farming government should implement a suitable pension scheme for the farmers. The social security benefit they presently get (Rs.1000) is not adequate to cover their basic needs.
- Mostly farmers use to store part of their yield until they get a good market price. But disregarding this fact the government continues to import OFC products impacting the farmers unfavorably. The farmers opine that the government can make an assessment of the availability of these products, particularly during the harvesting periods and rearrange the import policies accordingly.
- Farmers expect better insurance systems, and there are many complaints with regard to taking too much time for verifying and not visiting the field.
- In instances where some chemicals are banned, alternative solutions should be presented.
- The farmers stressed on the need to have all the institutions working in the sphere of agriculture in the area to be brought under one umbrella.

## **9.6 Group Discussion – Assistant Director’s Office - Jaffna**

A discussion was held with the participant officers in the field of agriculture and the Assistant Director of Agriculture in Jaffna. The forum was for them to bring out the issues confronting the farmers in the Jaffna peninsula. Assistant Director of Agriculture, Agriculture Instructors, Technical Officers in the district of Jaffna took part.

Scarcity of cultivable land emerged as a major problem. The availability of highland is limited to 0.25 to 0.50 acres and low land to one or two acres per family. With the increase of the family members gradually available land is fragmented. This is the core issue that has to be addressed in any programme of developing the OFC cultivation.

Farming in small land plots is labour intensive. As a result, 40% to 60% comprise the labour component in cost of production. At present in the Jaffna peninsula this is a common phenomenon, which leaves the farmers with a low profit margin incapacitating them from making a better investment in their farming pursuits, which might eventually even distance them from agriculture. But presently Jaffna farmers make a sizeable contribution to the country’s requirement of OFCs, vegetables, and fruits.

The dire need to convince the farmers of the correct farming practices is brought out by the fact that the same farmers have grown the same crop on the same land over a long period of time. They have not been aware of the advantages of crop rotation. Extension staff needs to intervene. Consequently, pest, insect, and fungus attacks are on the

increase. Compelling the farmers to resort to high doses of agro chemicals to control pest attacks marks a decreasing trend of the fertility and the productivity of land. This also leads to environmental pollution.

In Jaffna traditionally sunk wells are used for watering the crop cultivation. At present 64,000 farm families use sunk wells and there is an element of over usage of water. This traditional system is called "basin irrigation system". Electric motors are used to pump water. The system has its drawbacks; causing salinization, unnecessary waste of water resources and high costs. Under the "basin irrigation system" water is supplied for a period of four to five days. The wells are down to 30, 35 and 40 feet deep, necessitating the use of high powered expensive machines unaffordable to the farmers. The Department of Agriculture introduced the "drip and sprinkler" micro irrigation system providing water for one fourth of an acre. This system has been in operation since 2003. The Department instructed the farmers to supply water to the crops 10-20 minutes once a day. Inability to gain access to the micro irrigation system for want of money, lack of knowledge to operate the machinery, mechanical problems of the machines and the absence of repair facilities are the implications.

Most of the farmers do not have the skill in the operation and maintenance of agricultural machinery like "seeders and weeders" forcing them to depend on hired labour at a cost. This too adds to the cost of production.

The farmers in the Jaffna district depend on the traditional methods in post-harvest activities, having no cold storage facilities yet. Currently the farmers follow a popular traditional method. They spread the harvest on cement floor and cover it with gunny bags and sprinkle water. Invariably the quality of the commodity is severely affected depriving the farmer of a better price at the market. The farmers and the officers concerned have been clamoring over a long period of time for cold storage facilities to no avail. Recently introduced plastic crates system was also not successful. Naturally post-harvest losses are high, making a dent to the farmer's income.

Jaffna farmers mainly cultivate OFCs, grains, vegetables and fruits. Majority of the production is sold at local markets like at Kodikamem, Chavakachcheri, Jaffna, Thinnaweli, Chunnakame, Maradanamadam, Shankanai, and Nelliadi. A limited number of traders purchase the products at a low price and farmers cannot get a fair price.

In the past Jaffna farmers erected and maintained a live fence using a number of trees such as neem, sooriya, paawatta and giniseeriya. At the beginning of the cultivation season these farmers cut the foliage of the live fence and dump it into the field, providing organic fertilizer of some kind.

With sweeping changes of agriculture, live fence has given way to other protective methods. Herds of cattle were allowed to graze openly both in lowland and on highland for a period of about one month. During the period of ethnic war people left their villages

and the herds of cattle were destroyed. At present cattle population is growing but slowly compelling the farmers to purchase cow dung from distant areas at very high prices and currently the price of a lorry load of cow dung is around Rs. 40,000, necessitating the farmers to depend more on chemical fertilizer: It also ensues an environmental hazard.

The farmers follow the traditional system of putting on crops such as Green gram, sesame, groundnut and Black gram in the paddy fields after the paddy harvest is collected. Stray cattle destroy these crops. The farmers have given up this cultivation practice to allow 15,000 acres of paddy land to fallow.

The district of Jaffna has more than 20,000 agro wells. These wells have not been de silted or rehabilitated for over 20 years. Most of the wells desilted are of no use since it is impossible to pump out water. This is a sensitive issue for the farming community and they request the revamping of the existing resources of water to augment the water supply.

Shortfall of staff is another problem that besets the farming community. The district comprises 64,000 farm families for whose services the approved cadre of agricultural instructors is 33 but there is a paucity of three more offices. Along with this, the services of one more subject matter specialist and an Assistant Director of Agriculture can better the services. In Jaffna. Agricultural Instructors now functioning are in the ratio of one for 4,000 to 5,000 farm families.



## CHAPTER TEN

### Findings, Conclusion and Recommendations

#### 10.1 Findings

The OFC farmers in the Northern Province face many problems. Among many other issues reported in this province, the most pronounced issue is scarcity of cultivable land as reported in 30 ADCs. The second is pests and diseases. The others in line are issues related to marketing, access to marketing, climate change, labour issues, financial issues, lack of farm machinery and seed quality.

##### 10.1.1 Irrigation

The majority of the farmers in the Province used traditional irrigation methods with a few farmers resorting to new techniques such as drip and sprinkler irrigation. The major constraints in using these new methods were their lack of technical knowledge on using and, maintenance, and difficulties in establishing new irrigation systems due to high capital cost.

Most of the farmers in the Province constructed irrigation wells on sandy soils in each cultivation season, which were not permanent structures and required renovation or new constructions in each cultivation season. This short term and ad hoc practice of farmers required a considerable capital investment more than for construction of long term proper agro-wells. However, the shallowness of the agro-wells is a prominent feature of the Northern Province together with the siltation and the sedimentation it reduced the tank capacity impeding the farmers. The irrigation issue related to OFC cultivation has affected the livelihood of farmers who are compelled to reduce the extent of cultivation leading to a drop in the OFC production and crop damages for want of water. This vicious cycle continues unabated.

##### 10.1.2 Pest and Diseases

In the Northern Province OFC cultivation is adversely affected by pest and diseases due to climate change and off seasonal cultivation, and this problem is intensified further since the AIs who are vested with the responsibility of dealing with this issue, themselves lack of knowledge. The following table provides information on the existing pests and diseases in the province.

**Table 10.1: Existing Diseases and Control Methods**

<b>Crops</b>	<b>Diseases</b>	<b>Method of Control</b>
Black gram	Yellow mosaic Root rot Anthracnose	Chemical method and organic (Neem oil and cattle urine) control
Green gram	Yellow mosaic Root rot Anthracnose	Chemical method and organic (Neem oil and cattle urine) control
Groundnut	Root rot	Chemical methods
Chilli	Leaf curl Root rot (rainy season)	Chemical methods and Organic control (Neem oil)
Red onion	Slippery skin Root rot	Chemical methods
Cowpea	Yellow mosaic Root rot Anthracnose	Chemical methods

Source: Field Survey, 2016

### **10.1.3 Land**

The civil unrest that persisted for over 30 years in the Province contributed to the land issues currently prevailing in the Province in several ways. The chena cultivation was a general practice among the farmers in the Province before the civil unrest, which displaced the farmers from their residences and their farm lands ensued. The prevailing peaceful condition in the Northern Province offers opportunities for the farmers to recommence farming. However, they face difficulties in proving their land rights due to the misplacement of land deed certificates.

This deprives the farmers of their traditional livelihood of farming; some lands are still under the authority of Sri Lanka defense forces with some more under forest cover making it problematic to have clear demarcations. Contacted with this debacle they have to interact with Sri Lanka defense forces and the Forest Department for getting approval for farming pursuits in some land areas and dealing with other related legal issues.

Land fragmentation and land degradation are other issues which render the cultivation practice impossible.

### **10.1.4 Government Intervention**

The ADC maintains a set of agricultural equipment and machinery intended for farmer organizations and individual farmers. However, most of the machines are not in working

condition and the farmers are helpless in this situation. The absence of effective resource management in government institutions is another major issue in the Northern Province.

Functioning of the government crop insurance schemes, nonetheless, the smooth flow of these benefits to the farmers is not assured due to the inefficient functioning of the insurance providers, who take comparatively a long period of time for claim settlements. The rigid procedures involved in settling insurance claims also wean away the farmers from this social benefit scheme which is meant to provide financial assistance at times of crop losses. Another serious implications is that the farmers' requirement of resources, particularly financial is dwindled and they fall in to the sad plight of inability to farm their lands even in the next season; they are compelled to look for other means of livelihood.

#### **10.1.5 Marketing**

Low farm-gate prices at the harvesting period and lack of knowledge on marketing particularly in finding competitive markets and new market opportunities can be identified as the major issues in relation to marketing of the OFC products. The availability of imported OFC products at lower prices at domestic markets is a disincentive to the farmers as the imported products have dominated the domestic markets.

The low farm-gate price at the harvesting time can be attributed to many reasons. The farmers' indebtedness at the time of harvesting due to previous loans taken at the cultivation time to settle labour charges, cost of inputs, and cost of machinery create a situation where farmers had to sell their products at the existing price levels within a shorter period of time. So the farmers in the Northern Province tend to sell their products at lower prices to settle their loans. Lack of value added products, and the farmers' unawareness of value addition, shortage of proper storing facilities especially in the Vavuniya district and the oligopoly in purchasing had also contributed to the low farm-gate price. There is no government intervention for an OFC purchasing programme up to date and this causes the private trader to determine the price levels. As the Northern Province has comparatively a fewer number of private traders who engage in OFC purchasing this oligopoly situation is created.

The farmers in the Province shifted from OFC cultivation to fruit and vegetable cultivation due to this issue. The value addition of OFC products is currently not practiced as the farmers do not have capital to invest or establish value adding facilities and the farmers have to change over to entrepreneurial attitudes.

#### **10.1.6 Seed Quality**

The OFC seed requirement is fulfilled by the ADC, the private companies and the farmers' own production at farm level. According to the focus group discussion and farmers' perception, the seed available at private market outlets and the farmers' own products lack in quality in terms of germination and purity when compared with the ADC seeds.

However, the ADC fails to fulfill the total seed requirement of the area and the subsidized seeds distributed by the ADC are received by comparatively a few farmers in fewer quantities. Further the inefficiency of the ADC in providing seeds at the correct time at required quantities also creates many difficulties to the farmers.

## **10.2 Conclusion**

Despite the overwhelming contribution of OFCs in the daily diet, at present the OFC production is far short of local requirement thus a sizeable share of the OFCs is imported lending itself to soaring import costs. Unprecedented price hikes of these products at the world market is beyond our control and the only option left is to kick off a programme to increase the cultivation of these crops, which will contribute to cut down our import costs of these commodities. Annual requirement of chillies in Sri Lanka amounts to 50,000mt. and 95% of this is imported. In 2017 it cost Rs.130 to import a kilo of dried chillies and by 2018 rose to Rs.240. This situation exerted an unfavorable impact on the consumer and this the case even in other subsidiary food crops. To up the nutritional level of the people OFCs are of greater importance. For this, these crops should be readily available at an affordable price. The OFC cultivation needs to be enhanced to a greater extent to uplift the agro-industries. Suitable climatic conditions, and experienced farmer community and availability land are potentials in the North of Sri Lanka to develop OFC farming. Presently the lowest per-capita income in Sri Lanka is recorded in the Northern Province and it is an undebatable that for the purpose of creating additional source of income and uplifting the living standards of the people there, one alternative is to widen the cultivation of OFCs and increasing the OFC products.

In the course of this study a plethora of issues the farmers confront in the farming of OFCs in the North came to light and a series of solutions proposed by the farmers, in the field level officials and the higher level officials in this sphere are incorporated here. The study unfolds that these problems are inter-linked with a number of wider fields, impeding the socio-economic development of the area in particular and the development activities of the economy as a whole. As surfaced in this research exercise some of the major problems highlighted are – limited extent of land available for OFC farming, paucity of necessary machinery, lower labour productivity, pest and diseases, marketing and financial constraints, climate changes, loss of social prestige, damages by wild animals, shortage of technical officers at field level and higher level, lapses in the state policy about OFCs, short fall of good quality seeds, infrastructure facilities, market monopoly instead of competitive market, low quality of local OFCs in relation to the imported commodities, and pest attacks rendering it impossible to store the products at least for one year. Several proposals to iron out these debacles came forth from the farmers, the officers and the traders. Most of these need to be addressed without delay with the responsibility of implementation vested with the relevant organizations – the Ministry of Agriculture, Provincial ministries of Agriculture, Department of Agriculture, Department of Agrarian Development, Research Institutes, Provincial Councils, Ministry of Trade, Farmer Organizations and so on. The study finally concludes that a concerted effort by all the

stakeholders concerned will pave the way for sustainable development of the OFC cultivation.

### **10.3 Recommendations and Suggestions**

- Providing proper land deeds to the farmers is a real incentive in any government intervention in promoting OFC cultivation.
- Proper interaction of government institutions with farmers in providing subsidies, maintaining government law and procedures, knowledge dissemination and addressing the farmers' issues are crucial in developing the agriculture sector and the livelihood of farmers. Enhancing efficiency of the government institutes in the Province specially the ADC in resource management, improving the AI service and the extension service and crop insurance are also urgent.
- The government intervention in purchasing the OFC products at harvesting period, strengthening farmer organizations to enhance the bargaining power of the farming community, easing government bank loan procedures are important steps to ensure farmer welfare.
- Proper infrastructure facilities should also be improved to develop the OFC sector in the Northern Province.
- Irrigation issues are major constraints in the OFC cultivation. The government intervention to renovate existing tanks and canals, support for construction of agro-wells through subsidies or loans are of crucial importance.
- Ensuring quality seed availability at affordable price at the correct time, encourage organic farming, post harvest technology development, introducing value addition are also imperative to solve the issues related to the OFC cultivation in the Northern Province.

Cultivating paddy both in the *Maha* season and the dry *Yala* season has continued as a traditional cultural practice, the farmers need to be motivated to opt for OFCs in the *Yala* season so that they might have an extra source of income. The extension staff may try this out with a selected few farmers on an experimental basis for a couple of *Yala* seasons and the positive results will have a demonstration effect.

#### 10.4 Solutions –The Government Officers’ Perspective

##### **The Regional Director of Health Services in the Northern Province Expressed his Views based on his Experience.**

- In Sri Lanka the number of victims of non-communicable diseases has increased mainly due to malnutrition. Popularizing the cultivation and the consumption of the OFCs is a possible way out.
- In this context, setting up of womens’ organizations can be of immense help. Mothers who generally deal with child care and child feeding have to be impart knowledge about the nutritional value of the OFCs, a mix of which can enrich the meals.
- The educational authorities can ensure that school canteen catering to tens of thousands of school children make use of the OFCs in the preparation of their food items so that the students develop a preference and a taste for them.
- Agricultural authorities concerned can step in and encourage the farmers to grow more OFCs in their home gardens.
- RDHS is conducting awareness programmes of all the nutritional crops for students, preschool teachers and government officers. The school children have to be motivated to consume more OFC based foods.
- RDHS proposes to open *HELA BOJUN* /”Ammachchi” outlets all over the country in the near future.
- The Regional Director of Health also expressed the idea that awareness programmes should be extended for the bakery owners and the hotels to make extra food items of OFCs, as more and more patronize the hotels and other food outlets to save their time.

## ADDITIONAL DATA

### Mannar District Cost of Cultivation – Field Data

#### Paddy

Description (1 acre)	Rs.
Total Cost (Avg)	43000
Total Yield (Avg)	2100-2800 kg
Total Revenue= 35 to 40 Rs.	75000-80000 (2015 Maha)
Profit	35000-40000 (2015 Maha)

#### Groundnut

Description (1 acer)	Rs.
Total Cost (Avg)	50000
Total Yield (Avg)	500 kg(Dried)
Total Revenue =180 to 200Rs	100000 (2016 Yala)
Profit	60000-80000 (2016 Yala)

#### Green gram

Description	Rs.
Total Cost (Avg)	45000
Total Yield (Avg)	350 kg
Total Revenue =200 to 250 Rs	70000 (Maha)
Profit	35000

#### Big Onion

Description	Rs.
Total Cost (Avg)	76000
Total Yield (Avg)	2000-2500 kg
Total Revenue= 50Rs	100000
Profit	25000

#### Black gram

Description	Rs.
Total Cost (Avg)	35000
Total Yeild (Avg)	500kg
Total Revenue= 180 to 200Rs	100000(Maha)
Profit	65000

## Jaffna District Cost of Cultivation – Field Data

### Red Onion

Description	Rs.
Total Cost (Avg)	200000
Total Yield (Avg)	7500 kg
Total Revenue= 1900-2500Rs (50Kg)	300000
Profit	100000

### Chilli

Description	Rs.
Total Cost (Avg)	140000
Total Yield (Avg)	4000 (kg)
Total Revenue= 50 to 250 Rs. (depend on supply)	200000
Profit	60000

### Gingerly

Description	Rs.
Total Cost (Avg)	20000
Total Yield (Avg)	250
Total Revenue= 200Rs	50000
Profit	30000 ( <i>Maha</i> )

**Mullativu District Cost of Cultivation – Field Data**

**Groundnut**

<b>Description</b>	<b>Rs.</b>
Total Cost(Avg)	70000
Total Yeild(Avg)	600kg –dried
Total Revenue= 200Rs	140000
Profit	70000

**Paddy**

<b>Description</b>	<b>Rs.</b>
Total Cost(Avg)	45000
Total Yeild(Avg)	2500 kg
Total Revenue= 200Rs	70000
Profit	25000

**Chili**

<b>Description</b>	<b>Rs.</b>
Total Cost(Avg)	80000
Total Yeild(Avg)	3000 (kg)
Total Revenue= 70	140000
Profit	60000

## REFERENCES

- Annual Performance report, (2015), District Secretariat of Mullaitivu.
- Annual Performance report, (2015), District Secretariat of Vauniya.
- Annual Performance report, (2016), District Secretariat of Jaffna.
- Annual Performance report, (2016), District Secretariat of Killinochchi.
- Annual Performance report, (2016), District Secretariat of Mannar.
- Annual Reort (2015), Central Bank of Sri Lanka.
- Anon., (2015), *Annual Report*, s.l.: Central Bank Of Sri Lanka.
- Anon., n.d. <https://palmyrafencing.wordpress.com/>. [Online].
- Anon., n.d. *NATIONAL ACCOUNTS OF SRI LANKA-2014*. s.l.:Department of Census and Statistics.
- Anon., n.d. *Other Field Crop Cultivation Extent-2015/16 Maha and Yala* , s.l.: Ministry of Agriculture.
- Cultivation, C. o., 2013/14. *Cost of Cultivation Of Agricultural Crop Maha/Yala Season*. s.l.:Socio Economics & Planing Centre, Department of Agricultur, Peradeniya.
- Dev, S., (2011), *Small Farmers in India challenges and Opportunities*, Beijing: Emerging Economic Research Dialogue -ICRIER.
- Dharmaratne, M., (2014), *HUMAN-ELEPHANT CONFLICT AND SOLUTIONS TO IT IN SRI LANKA.*, Colombo: Young Researchers' Forum- PGIS, HARTI, Colombo. Sri Lanka
- Dharmaratne, T., (2014), *An Overall Assessment of Agricultural Marketing Systems in Northern Province of Sri Lanka*, HARTI.
- District Secretariat Hand Book (2016), District Secretariat of Killinochchi.
- Jayatissa, R.L.N., Wickramasinghe, W.D., Piyasena, C., (2014), *Food Consumption Pattern in Sri Lanka*, HARTI, Colombo.
- Nations, U., (1992),  
[https://unfccc.int/files/essential\\_background/background\\_publications\\_htmlpdf/application/pdf/conveng.pdf](https://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf). [Online].
- Programme, S. f. c. p., (2015), <http://www.agrimin.gov.lk/web/index.php/en/project/12-project/733-supplimentary-eng>. [Online].
- Rabinowits, Cambridge University press, (2005).
- Secretariat, D., (2012), *Annual Performance Reports*, s.l.: District Secretariat.
- Secretariat, V. D., (2015), *Annual Report*, Kilinochchi:  
[http://www.Kilinochchi.dist.gov.lk/index.php?option=com\\_content&view=article&id=45&Itemid=57&lang=ta](http://www.Kilinochchi.dist.gov.lk/index.php?option=com_content&view=article&id=45&Itemid=57&lang=ta).
- Sharmini K., (2016), *Mechanization in Other Field Crop Sector: A Situational Analysis*, HARTI.
- Thilakaratna, H.M., (2005), *Farm Mechanization in Rice Cultivation Farm Mechanization Training Center*, Anuradhapura, Sri Lanka.
- Thirgood, Woodroffe, Rabinowits, (2005), *People and Wildlife or Co-existence*, Cambridge University Press.

Thirgood, Woodroffe, People and Wildlife, Conflict or Co-existence  
United Nations Framework Convention on Climate Change, 1992.  
Wickramasinghe W.D., (2013), Rabinowits, Change in Other Field Crop Cultivation in the  
North Western Province HARTI, Colombo, Sri Lanka  
Wijesinghe, R. at el., (2015), Socio Economic Factors Affecting the Productivity of Green  
gram.sl: HATTI, Colombo, Sri Lanka