

A Review of the Fertilizer Cash Grant Programme in Sri Lanka

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FOREWORD

Many developing countries encounter continuous challenges in increasing their agricultural production and concerns over food security have forced governments to intervene in the sector, particularly providing input subsidies to farmers to ensure a higher and uninterrupted supply of agricultural commodities. Therefore, robust fertilizer related policies are crucial for any national effort aiming at improving agricultural productivity and large scale agricultural input subsidies were a common and major feature of agricultural development policies in poor rural economies from 1960s to 1980s.

The Government of Sri Lanka has also introduced a number of policies and programmes to increase paddy production since independence and the fertilizer subsidy programme is the most long lasting, most expensive and most politically sensitive policy implemented to promote rice cultivation in the country. The subsidy policy has evolved over time since its inception in 1962 and the Fertilizer Cash Grant (FCG) programme was introduced in 2016 and was implemented during the cultivation seasons from 2016 *Yala* to 2017/18 *Maha*. With the introduction of the FCG programme in 2016, there is a dialogue among policymakers, government officials, farmers, media and the general public towards both positive and negative results of the programme. In that context, this study was carried out in 2017/18 to review the FCG programme to make appropriate policy recommendations for designing an effective subsidy programme in the future.

The study provides a comprehensive analysis on the FCG programme and fertilizer subsidy policies in general. Therefore, I believe that the findings and recommendations of this study would be immensely beneficial to policymakers and decision-makers of the country, technical experts, implementers, researchers and academia in the field.

Keerthi B. Kotagama
Director/CEO

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EXECUTIVE SUMMARY

Among numerous initiatives and policies mooted by the Government of Sri Lanka aimed at boosting paddy production since independence the fertilizer subsidy programme is rated high in terms of consistency, staggering cost and political sensitivity associated with it. This study was carried out in 2017/18 to review the Fertilizer Cash Grant (FCG) programme, a change introduced in 2016 to the subsidy policy, to make appropriate policy recommendations for designing an effective subsidy programme in the future with the specific objectives of (i) examining the operational mechanism of the programme, (ii) ascertaining the farmers' responses towards the FCG programme and to identify the challenges faced by both implementers and beneficiaries of the programme, (iii) assessing the cost-effectiveness of two fertilizer subsidy programmes and (iv) proposing strategies and recommendations for an effective fertilizer subsidy scheme in the future.

The study adopted a mixed approach. The primary data collecting tools were key informant interviews, a sample survey, case studies and focus group discussions. Data was collected from September to December 2017. Multi-staged random sampling technique was employed to identify the respondents of the survey that focused on 270 paddy farmers in Anuradhapura, Ampara, Kilinochchi, Kurunegala, Polonnaruwa and Matara districts representing major, minor and rain-fed cultivation systems. For other field crops, Badulla (potato), Jaffna (red onion and chilli) and Moneragala (maize) districts were selected and the total sample size was 120. In addition, data and information were collected from government officials implementing the programme. Finally the collected data was subjected to a descriptive analysis.

Farmers expressed mixed reactions with regard to the Fertilizer Cash Grant Programme. A few paddy farmers had not received it despite having applied for while another few paddy and OFC farmers had experienced a drop in their cultivation and production due to the inadequacy of the grant, inferior quality of the fertilizer and delays in receiving the grant which was more prominent under major irrigation schemes. On the contrary, fewer paddy and OFC farmers had a surge in harvest in spite of receiving fine quality fertilizer, application of fertilizer at the right time, use of more inorganic fertilizer, refraining from over usage of inorganic fertilizer and use of more organic fertilizer in the field. Thus production has not marked a change significantly subsequent to the introduction of the FCG programme. However, in all the locations either more or less use of inorganic fertilizer could be observed at notable levels among paddy farmers following the change of the programme. In case of the majority of the OFC farmers the

amount of inorganic fertilizer they used remained unchanged. Over half of the farmers did not note any quality difference in the fertilizer provided under the two programmes.

Misuse of the grant was not observed at significant levels in the study sample. However, in certain study locations the farmers had to spend more than the grant predominantly in major irrigation schemes and among OFC farmers. Conversely, a significant number of farmers under rain-fed farming saved from the grant. Majority of the farmers reported not receiving the grant on time necessitating them to resort to their own means to buy fertilizer. However, they had applied fertilizer on time.

The majority of paddy and OFC farmers pointed out a series of drawbacks they come across in using organic fertilizer; organic fertilizer is not easy to get at, high cost, requires a lot of space and time and raw material in large quantities for the production process, requires in large quantities, absence of know-how in the preparation and lack of awareness of its importance.

All the farmers are willing to go for soil tests provided easily accessible and available at an affordable rate. However, no such practices have been followed so far.

Officials who implemented the programme hailed it because of convenience, limited corruption, consuming less time and transparency.

Having a better control over time, place, quantity and quality of buying are considered as advantages of the FCG programme while the disadvantages are related to the delay in the release of the grant, insufficiency of the grant and non-availability of fertilizer at the market when required.

Nearly half of the paddy farmers preferred the previous fertilizer subsidy programme as opposed to 38 percent who preferred the Fertilizer Cash Grant Programme while 14 percent suggested a new method. Therefore, despite the implementation flaws in the FCG programme no strong opinion was expressed for or against it.

With the introduction of the Fertilizer Cash Grant Programme, a marked decline in the imported solid fertilizer quantity was evident in 2016 and 2017. Further, a notable reduction in the government expenditure and the government expenditure as a percentage of GDP compared to the previous year were also recorded in those two years. At the same time, involvement of the state-owned companies in importing fertilizer had significantly declined. Data also shows that there was no significant change in the number of paddy farmers assisted through the subsidy programme following the change in 2016.

In that context, it can be concluded that the Fertilizer Cash Grant Programme is a desirable strategy which provides benefits to all the stakeholders, the farmers, the

government and the implementing officials and it helps minimizing negative environmental hazards in contrast to those of the previous fertilizer subsidy programme. However, proper implementation of the programme should ensure minimising the operational drawbacks to derive full benefits of the programme.

It is recommended that the policies should not be changed frequently as it affects yielding of results and if changing it should be after a proper assessment with a scientific background. The fertilizer subsidy policy design and implementation should also be integrated with other policies for increasing agricultural productivity and rural development.

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ABBREVIATIONS

AI/AIs	Agriculture Instructor/s
AISP	Agricultural Input Subsidy Programme
ARPA/ARPAs	Agriculture Research and Production Assistant/s
ASC/ASCs	Agrarian Services Centre/s
DO/DOs	Divisional Officer/s
DOA	Department of Agriculture
FCG	Fertilizer Cash Grant
FGD	Focus Group Discussion
FS	Fertilizer Subsidy
FSP	Fertilizer Support Programme
GDP	Gross Domestic Produce
GN	Grama Niladhari
HARTI	Hector Kobbekaduwa Agrarian Research and Training Institute
IFDC	International Fertilizer Development Center
IPNMS	Integrated Plant Nutrient Management Systems
ISP/ISPs	Input Subsidy Programme/s
K	Potassium
MOP	Murate/Muriate of Potash
MUM/MUMs	Mahaweli Unit Manager/s
N	Nitrogen
NAAIP	National Accelerated Agricultural Input Programme
NFS	National Fertilizer Secretariat
NGO/NGOs	Non-Governmental Organization/s
NPK	Nitrogen Phosphorus Potassium
OF	Organic Fertilizer
OFC/OFCs	Other Field Crop/s
P	Phosphorus
RP	Rock Phosphate
SA	Sulphate of Ammonia
SLCARP	Sri Lanka Council for Agricultural Research Policy
SP	Starter Pack
TIP	Targeted Input Programme
TSP	Triple Super Phosphate

CHAPTER ONE

Introduction

1.1 Background to the Study

The Government of Sri Lanka has introduced a number of policies and programmes to increase paddy production since independence. The fertilizer subsidy programme is one of the long lasting, very expensive and politically sensitive policies implemented to promote paddy cultivation in the country. It was initiated in 1962 (that is, at the onset of the Green Revolution), and it has been in operation for more than five decades. The main objective of the programme is to induce farmers to adopt high yielding varieties with a view to achieving self-sufficiency in rice as well as to help them defuse their financial liabilities. The subsidy policy has evolved over time since its inception in 1962 and the Fertilizer Cash Grant (FCG) Programme was introduced in 2016. The main objectives of the FCG Programme are to cut down the high usage of inorganic fertilizer, encourage the usage of organic fertilizer and allow the farmers to make effective decisions with regard to identifying and the application of the most suitable quantities of fertilizer for their fields based on soil tests. With those objectives, the new programme was implemented during the cultivation seasons in 2016 *Yala* onwards.

1.2 Research Problem/Justification

As fertilizer is an essential input in agriculture, any fertilizer related policy is crucial for national effort aiming at improving agricultural productivity. As mentioned earlier, the government of Sri Lanka has supported the farmer community in the country since 1962 by providing subsidies for fertilizer at staggering costs with the objective of improving the production and productivity. With the introduction of the FCG programme in 2016, there is a dialogue among policymakers, government officials, farmers, media and the general public towards both positive and negative outcomes of the new programme. Therefore, it is timely to review the FCG programme to understand the benefits of the new programme by drawing comparisons with the previous programme and to make appropriate policy recommendations for designing an effective subsidy programme in the future.

At the same time, the National Committee on Socio-economics and Policy Analysis of Sri Lanka Council for Agricultural Research Policy (SLCARP) has identified this issue as a priority research area under the section 'Agricultural Inputs'. In addition, a written request has been made by the Secretary of the Ministry of Agriculture to review the

new programme. It was in this context, that the study was carried out in 2017/18 to review the FCG programme.

1.3 Objectives of the Study

The main objective of this study was to review the current FCG programme to make appropriate policy recommendations for an effective subsidy programme.

The specific objectives were

- i. to examine the operational mechanism of the FCG programme,
- ii. to ascertain the farmers' responses towards the FCG programme and to identify the challenges faced by both implementers and beneficiaries of the programme,
- iii. to assess the cost-effectiveness of two fertilizer subsidy programmes and
- iv. to propose strategies and recommendations for an effective fertilizer subsidy scheme in the future.

1.4 Organisation of the Report

The report comprises nine chapters. Chapter One presents the introduction and Chapter Two is the literature review. Chapter Three presents the methodology of the study in detail. As a background to the study, Chapter Four explains the fertilizer subsidy programmes in Sri Lanka and their operational mechanisms in detail. Introduction to the surveyed sample is presented in Chapter Five. With that background, Chapter Six attempts to analyse the changes with the introduction of Fertilizer Cash Grant Programme. Chapter Seven presents the perception towards the Fertilizer Cash Grant Programme and Chapter Eight analyses the macro situation of the country with reference to the fertilizer subsidy programmes. Finally, Chapter Nine presents major findings, discussion, conclusion and recommendations.

CHAPTER TWO

Review of Literature

2.1 Introduction

In this review, an attempt was made to identify the fertilizer subsidy programmes operated in the world, their implementation strategies, impacts, challenges and political economy of those programmes and best practices and lessons learnt. Finally, attention was focused on reviewing several important research studies of fertilizer subsidy programmes implemented in Sri Lanka with special reference to factors influencing their success and failure.

2.2 Importance of Fertilizer

Fertilizer is an essential input to the agricultural production process. Fertilizers are materials which contain one or more plant nutrients and applied to the growing media to support the plant growth. Therefore imperatively they should contain essential plant nutrients. At the same time, all essential plant nutrients are not required in the same quantity. On the other hand, it is necessary to supply only the correct amount of nutrients to a soil that is expected to be consumed by the crop. Therefore, fertilizing the soil means adding enough nutrients to produce economic yield or yield goal of the producer and no fertilizer is recommended beyond which no economic response is expected. At the same time, it is important to consider the right source, right rate, right time and right place of fertilizing the soil.

Fertilizers can be broadly divided into two groups based on the source as inorganic fertilizers and organic fertilizers. The main organic fertilizers are animal waste, peat, plant waste from agriculture and treated bio solids and liquids. Organic fertilizers usually contain fewer nutrients, but offer other advantages in agriculture in the practice of environmental friendly farming, organic fertilizers supply micro-nutrients, increase fertilizer use efficiency, energy source for many different micro organisms, nourish many biological reactions vital to good soil structure, promote soil aggregation and stable aggregates greatly aid in soil porosity and better water holding capacity and suppress soil borne diseases. Organic/Bio fertilizer except sea weed extract and Neam cake is not allowed to be imported to Sri Lanka and the local producers within the country also need to obtain production licenses. The main focus of this report is inorganic fertilizer and promoting use of organic fertilizer is also a sub activity in most of the inorganic fertilizer programmes.

In the developed countries, it is generally agreed that fertilizer demand is price inelastic. This may be due to lack of an economic substitute to chemical fertilizer. Generally, in the less developed countries the demand for fertilizer is thought to be more elastic under the assumption of readily available substitutes such as manure and other organic materials. However, the demand for fertilizer may differ from country to country due to such factors as cultural practices, climate, soil type, crops grown and farm structure (Ekanayake, 2005).

2.3 Fertilizer Subsidy Programmes

As fertilizer is an essential input in agriculture, strong fertilizer related policies are crucial for any national effort aimed at improving agricultural productivity. Whatever the cost factor, in the absence of substitutes for fertilizer, the farmers tend to use them in order to ensure optimum yield levels disregarding the financial storms they have to come across. An increase in fertilizer price results in a drop in the farmers' profit as it enhances the cost of production. Increasing produce/output prices or decreasing fertilizer prices are the alternatives available to the government to provide incentives to the farmers in the short run. Even though increase in output price could be crucial as such a policy would have negative implications on the entire society. Hence, policymakers should weigh pros and cons of two options available before making a decision (Ekanayake, 2005).

Dorward and Chirwa (2011) also state that affordability of fertilizer is a major problem for poorer farmers as they face both a 'hungry gap' during the cropping period and limited borrowing opportunities, at very high costs. Improving the profitability of fertilizer use requires lower fertilizer prices, higher output prices and greater efficiency in fertilizer use. High output prices are a two-edged sword, so that most (particularly poorer) people's livelihoods and food security are affected by high output prices. Furthermore, increased output prices and improved efficiency of fertilizer use will not improve the affordability of fertilizer for poor rural households. Therefore, this requires huge fertilizer cost reductions or low-cost and accessible financial services.

In that context, as stated by Dorward (2009) large scale agricultural input subsidies were a common and major feature of agricultural development policies in poor rural economies from the 1960s to the 1980s. Similarly, Rodrigo and Abeysekera (2015) too state that many developing countries are facing the continual challenges in increasing their agricultural production and concerns over food security have pushed governments to intervene in the sector, particularly providing input subsidies to farmers to ensure a higher and uninterrupted supply of agricultural commodities. Among many input subsidy schemes implemented, subsidies for fertilizer have undoubtedly been a major agricultural intervention for many developing countries, despite the enormous financial

burden on the budget of governments of such countries. Minde *et al.* (2008) also state that the role of input subsidies in stimulating growth and addressing food security and poverty alleviation objectives has re-emerged as an important agricultural policy debate. Sharp increases in world food and fertilizer prices in 2007 and 2008 have created a sense of urgency in meeting productivity and social welfare goals, and have put fertilizer promotion programmes and fertilizer subsidies high on the list of options for government and donor responses to the crisis.

Jayne and Rashid (2013) show that input subsidy programmes have once again become a major plank of agricultural development strategies in Africa. Ten African governments spend roughly US\$1 billion annually on input subsidy programmes, amounting to 28.6 percent of their public expenditures on agriculture. Mujeri *et al.* (2012) also state that economies such as Nepal, India and Pakistan are also highly agriculture-based undertake planting on a seasonal basis and input subsidies for fertilizer are a priority on the development agendas of these governments. Holden and Lunduka (2012) too show that some African countries, especially Malawi and Zambia, have been reintroducing large agricultural input subsidies since 2005 and they have even been able to get support for this from many international donors including the World Bank. National and household food insecurity was important for the reintroduction of such subsidies and targeting such subsidies toward poor and vulnerable households and increasing the emphasis on poverty reduction were important reasons for the donors' support of such subsidies. Dorward (2009) states that according to the International Fertilizer Development Center (IFDC), towards the end of 2008, reported new, expanding or continuing subsidy programmes in China, India, the Philippines, Sri Lanka, Indonesia, Ghana, Nigeria and Malawi. Other countries that introduced new or expanded fertilizer subsidy programmes include Tanzania, Kenya, Rwanda, Mali, Senegal and Bangladesh.

However, fertilizer subsidies were particularly expensive and made heavy and growing demands on government budgets as they stimulated increased fertilizer consumption while political interferences also led to pressures for the subsidy rate to increase, or at least not contract, in the face of growing fertilizer prices. Input subsidies in developing countries have commonly been targeted towards small-holder rather than commercial farmers, with mechanisms directing subsidised inputs away from large scale commercial farms and regulations prohibiting sale of subsidised inputs by recipients (Dorward, 2009).

According to Dorward (2009), the input subsidy programmes can and do have a wide range of different objectives and most of these objectives are mutually complementary. The objectives are as follows;

- i. Wider (pro-poor) economic growth
- ii. Consumer benefits - lower output prices, access

- iii. National / household food self-sufficiency / security
- iv. Input adoption
- v. Input use efficiency
- vi. Producer welfare (emphasis on poorer producers)
- vii. Input supply system development and efficiency
- viii. Soil fertility replenishment
- ix. Political benefits (personal, party, etc.)

Minde *et al.* (2008) also state that input subsidy programmes may have various objectives, including increasing agricultural productivity, improving food security, or providing income support for poor farmers. National and household food security objectives may be especially urgent in times of crisis, such as rapid and major increases in fertilizer and food grain prices. Further, Minde *et al.* (2008) point out that regardless of their objectives, the design and implementation of input subsidies should be 'smart' as (a) their benefits in terms of agricultural productivity and food security exceed what could be achieved by investing the resources in other areas; and (b) they encourage farmers' purchases of fertilizer on commercial terms, or at least do not impede it, which could result if government input subsidy programmes crowd out commercial transactions or undermine investment in fertilizer distribution by suppliers and agro-dealers. Druilhe and Barreiro-Hurlé (2012) also point out that fertilizer subsidy programmes implemented after mid-2000s are supposed to consist of 'smart'. Smart subsidies are specifically targeted with achievable goals to farmers who would not otherwise use the subsidised input. These subsidies should result in measurable impacts, and these subsidy programmes should be implemented in time. However, whether they are truly smart in design and practice is doubtful.

Minde and Ndlovu (2007) describe 'smart' subsidies as those involving **(S)**pecific targeting farmers who would not otherwise use purchased inputs (or to areas where added fertilizer can contribute most to yield improvement), **(M)**easurable impacts, **(A)**chievable goals, a **(R)**esult orientation, and a **(T)**imely duration of implementation, i.e., being time-bound or having a feasible exit strategy.

Morris *et al.* (2007) identify ten guiding principles for subsidies to be 'market smart' and they are as follows;

- i. Promote the factor or product as part of a wider strategy that includes complementary inputs and strengthening of markets
- ii. Favour market-based solutions that do not undermine incentives for private investment
- iii. Promote competition and cost reductions by reducing barriers to entry
- iv. Recognise that effective demand from farmers is critical for long-run sustainability

- v. Insist on economic efficiency as the basis for fertilizer promotion efforts
- vi. Empower farmers to make the decisions about soil fertility management
- vii. Devise an exit strategy to limit the time period of public interventions
- viii. Pursue regional integration in order to benefit from the economies of market size
- ix. Emphasize sustainability as a goal when designing interventions and
- x. Promote pro-poor growth, in recognition of the importance of equity considerations

Minde *et al.* (2008) explain the factors which determine the costs of fertilizer subsidies and accordingly the main two factors are as follows;

- i. *The cost of acquiring the fertilizer* - World fertilizer prices have more than doubled over the past year and ocean freight and transport costs have also increased, reducing the potential returns to fertilizer subsidy programmes. The subsidies needed to bring farm-gate fertilizer prices down to levels considered affordable to low-income farmers will require greater outlays from national budgets than in prior years.
- ii. *The full economic cost of implementing the fertilizer subsidy programme* - These costs include not only the economic costs of distributing and applying the fertilizer but also the opportunity costs of the resources used in the programme. If subsidies are too high, there is also a risk of over application of fertilizer leading to huge environmental costs.

However, input subsidies are not a quick fix for dealing with high food and fertilizer prices: their design and sustainable implementation must promote smallholders' incremental access to and productive use of inputs, build sustainable demand and private sector supply, and be integrated with other policies for increasing agricultural productivity, rural development and management of incremental production to provide rural people with reliable improvements in food access and real incomes. At the same time, Ekanayake (2005) shows that a sudden withdrawal of the subsidy will push farmers in low-income groups into a worse situation than they were in the past. Therefore, at least there should be a way to group farmers according to their income levels and to help low income group with subsidies and well-targeted subsidy scheme, which is subjected to gradual phase out, is preferred in the short run.

In contrast, Chinsinga (2007) argues that subsidies as a failure due to subsidies risk crowding out the private sector, subsidies create market distortions and displace public infrastructure investment and targeting extremely difficult to achieve. Holden and Lunduka (2012) also show that use of agricultural input subsidies has been controversial in developed and developing countries for several decades. Such subsidies have been associated with inefficient resource use, pollution, government budgetary deficits and

distorted prices and terms of trade. Since the 1980s, the World Bank and the International Monetary Fund have provided loans to indebted developing countries conditional on their removal of agricultural input subsidies, although many African countries have resisted against this conditionality. Similarly, Druilhe and Barreiro-Hurlé (2012) also state that subsidies are not desirable in a world of perfectly competitive markets as they result in large fiscal costs. However, when markets do not work well or when the farmers are physically and monetarily unable to have access to fertilizer, fertilizer subsidy programmes can be economically justified.

Filipski and Taylor (cited in Wijetunga and Saito, 2017) also indicate that subsidies are the least efficient way of transferring income to agricultural households and in South Asia, fertilizer subsidies are crowding out investments in essential public goods. For example, they have shown that according to World Bank estimations in 2010 that investment in Bangladesh has fallen from 5.2 percent over less than a decade, mainly because of increased spending on the fertilizer subsidy. Also the government control of the fertilizer market in Bangladesh resulted in misallocation of resources and inefficient production distribution.

2.4 Implementation Strategies of Fertilizer Subsidy Programmes

Balance of programme objectives determines the key design and implementation elements of input subsidy programmes and according to Dorward (2009), the key elements are as follows. These elements are highly inter-related, with many synergies and trade-offs.

- i. Basic subsidy system (focus on consumer or producer benefits, direct recipients)
- ii. Product focus – staple foods, cash crops, etc.
- iii. Scale – beneficiary coverage
- iv. Subsidy per beneficiary
- v. Total volumes subsidised
- vi. Voucher or other entitlement systems, distribution and input access systems and timing
- vii. Rationing – objectives, methods
- viii. Targeting (if rationing) – objectives, criteria and methods
- ix. Input supply systems (involvement of or private wholesale and retail suppliers) and timing
- x. Secondary market and leakage policies (and enforcement mechanisms)
- xi. Complementary integration and investments and policies

Dorward (2009) further argues that there is a strong tendency for programmes to focus on production objectives and producer welfare and to ignore the interests of consumers

and the processes (and necessary conditions) for subsidy programmes to contribute to wider pro-poor economic growth. This is a critical omission, and is linked to the limited extent that the design and implementation of many programmes are integrated with complementary investments. Such integration is needed first for subsidy programmes to effectively deliver their stated objectives of incremental production, and then for them to contribute to wider processes of pro-poor growth. Recognition of the importance of consumer price benefits and of the price productivity tightrope is also particularly important.

Wijetunga and Saito (2017) show that fertilizer subsidy is provided in countries in different forms such as state supply of fertilizer, cash payment, voucher/coupon system, reduced market price or transport subsidy. In the 1970s and early 1980s, a majority of African countries subsidised and sold fertilizer through state-owned enterprises. These programmes were roundly criticized for being costly, inefficient, overwhelmingly beneficial to large-scale farmers and detrimental to the private sector (Carter *et al.*, 2013). Druilhe and Barreiro-Hurlé (2012) show that national fertilizer subsidy programmes implemented in the Sub-Saharan Africa since late 1990s had been targeted at small scale farmers (as those in East Africa) plus universal (untargeted farmers, but targeted crops as those in West Africa).

Carter *et al.* (2013) also show that voucher coupons are intended for distribution exclusively to poor farmers who then use the coupons to purchase inputs, often with a cash-copayment. These voucher schemes have been argued to offer the advantages of traditional fertilizer subsidy while, targeting the poor more effectively and stimulating rather than undermining the private sector. Under this logic, coupons will stimulate a reliable and widely spread supply of inputs by the private sector. Effectiveness of the programme depends on the government's ability to efficiently target and administer the programme, the responsiveness of private input suppliers to voucher induced demand and small farmers' willingness and ability to meet co-payments and to learn rapidly.

Druilhe and Barreiro-Hurlé (2012) also define vouchers as a specific mean of distributing the fertilizer subsidy. Vouchers act as coupons and allow the smallholder farmers to purchase the inputs at a lower cost. Vouchers may have a fixed (as in Tanzania) or a flexible value (as in Malawi). They are flexible, transparent and easy to target farmers. However, there could be disadvantages with vouchers, because reselling of vouchers can result in fraud and leakages. Also, administration and monitoring of vouchers are quite costly.

Minot and Benson (2009) state that the input vouchers are preferable to direct state distribution of fertilizer because the use of input vouchers promises to stimulate the development of a private sector input supply chain. However, the experiences of

Malawi reveal that voucher based subsidies do not necessarily promote the development of private distributors. They further noted that vouchers appear to be a poor choice for attaining social safety net and poverty reduction objectives, even in rural farming communities.

As mentioned by Kapur *et al.* (2008) the administrative costs of cash transfer programme are much less because it has high initial fixed costs but modest subsequent annual costs. Further, cash transfer would help remove the inherent inequality in subsidies. As highlighted by Kapur (2011), cash transfers could be seen as basic income support for the poor, allowing them to make their own choices more effectively over the long term, as market infrastructure improves and production stabilizes. Conversely, some researchers justify the fertilizer subsidies and question the rationale for direct transfer. As per Sharma and Thaker (2010), the direct transfer of subsidy to farmers is not a right policy decision in India because it would be difficult to ensure that direct transfer of subsidy to farmers is actually used by farmers only for buying fertilizer and there are no leakages in the transfer of the subsidy. Hence, it might adversely affect agricultural production in the country, if the subsidy is not used for fertilizer.

As said earlier, different countries have adopted different techniques and the experiences of India, Malawi, Kenya, Nigeria, Ghana and Zambia are presented below in detail.

India

Agricultural subsidies have become one of the most contentious issues of the economic policy in India and major agricultural inputs such as canal irrigation water, fertilizer, credit and seeds are subsidised. A fertilizer policy was envisaged for providing fertilizers to farmers at subsidised prices to induce them to use fertilizer by providing fertilizers at an affordable price and ensure adequate returns on investments to entrepreneurs (Sharma, 2012).

Malawi Starter Pack Programme (SP), Targeted Input Programme (TIP) and Agricultural Input Subsidy Programme (AISP)

Malawi remains one of the poorest countries in the world whether judged by gross national product, the United Nations Development Programme's Human Development Index or its Human Poverty Index. Malawi further remains a predominantly agro-based and donor dependent economy. Further, existing statistics indicate that the problem of food insecurity is indeed rampant (Chinsinga, 2007).

In the 1998/99 and 1999/2000 agricultural seasons the Malawi Government, with donor support, implemented a large scale programme under which all farm households in Malawi received an input 'starter pack' (SP) comprising 15kg of fertilizer, two kg of

maize seed and some legume seed. From 2000/2001 the programme was scaled down to the 'Targeted Input Programme' (TIP) with a smaller quantity of fertilizer (10kg) per beneficiary and targeted selection of beneficiaries. From 2005/6, however, the government has taken a different approach with a very large scale programme, the Agricultural Input Subsidy Programme (AISP) providing about 50 percent of farm households with vouchers for 100kg of fertilizer and small quantities of maize (and latterly legume) seed, with mainly privately imported fertilizers delivered principally, and in some years exclusively, by two parastatal input suppliers (Dorward, 2009).

Kenya National Accelerated Agricultural Input Programme (NAAIP)

Kenya is one of the few countries in Sub-Saharan Africa to experience an impressive rise in fertilizer use following a series of input market reforms in the early 1990s (Sheahan *et al.*, 2016). In 2007 the Kenya government decided to embark upon a National Accelerated Agricultural Input Programme to promote food security, agricultural input use, input market development and agricultural productivity. Initially planned to subsidise fertilizers and maize seed for a limited number of districts, it has subsequently been expanded to national coverage with plans to provide 2.5 million farmers with maize seed and fertilizers for 0.4 ha each, with vouchers issued to targeted farmers (disadvantaged households with land) and subsequent redemption through private input sellers who would also be eligible for trade credit guarantees (Dorward, 2009).

Nigeria

Nigeria has a long history of fertilizer subsidies dating back to 1937. Over the years, fertilizers were subsidised to ensure reduction in retail price and orderly supply, thus improving affordability. However, apart from scarcity and adulteration, most farmers paid prices far above the Government subsidised rates and fertilizers were usually not supplied at the right time. Hence farmers had to leave their farm work and make multiple trips to distant markets in search of a few bags of fertilizer but in most cases they returned empty handed. In 1998, government withdrew the price subsidies on fertilizers and deregulated the marketing system due to ample evidence that the government subsidy and benefits of the regulated marketing system did not reach the farmers for whom they were meant. Then the sale of fertilizer became free for all in the open market, but fixing of prices of fertilizers still remained the statutory monopoly of government to ensure availability of fertilizer to farmers at fair prices throughout the country (Akpokoand and Yiljep, 2001).

Ghana

Fertilizer use in Ghana represents one of the lowest rates in Sub-Saharan Africa, which is already the lowest consumer of fertilizer in the world. All inorganic fertilizer in the country is imported ready-for-use by private importers. In Ghana, the fertilizer sector is

completely liberalized and the government is not involved in any way in procurement, distribution and retailing of fertilizer.

In 2008, the government of Ghana instituted a country-wide subsidy on 50kg bags of four types of fertilizer in an effort to mitigate the effect of rising energy and food prices. The presumed goal of the subsidy programme was to encourage fertilizer use so that food crop output would not be drastically reduced due to the soaring cost of fertilizer. Among other recent fertilizer interventions in Africa, Ghana's fertilizer subsidy programme was unique in the extent to which the government engaged and utilized the private sector. The government has consulted heavily with fertilizer importers in the design of the programme and has relied exclusively on the existing private sector. Farmers received the subsidy in the form of fertilizer-and-region-specific vouchers distributed by agricultural extension agents. For the subsidy programme, the government and the private fertilizer importers have negotiated the price per 50kg bag in each regional capital. The subsidy or the face-values of the vouchers differed across regions: For each type of fertilizer, the face value of the voucher generally increased with the distance from the port. A voucher could be used towards the purchase of the relevant fertilizer from any retailer in the region of issue that was willing to accept it. The retailer then passed on the redeemed vouchers to an importer and the importer in turn was to transmit an invoice for the value of vouchers to the Ministry of Food and Agriculture and receive payment within a week. The supplemental cash amount to be used with vouchers, that is, the price to farmers, was announced widely on radio and television. By this process, most farmers learnt when the subsidy programme began (Banful, 2009).

Zambia Fertilizer Support Programme (FSP)

Zambia has been implementing fertilizer subsidies for a long period. Fertilizer is imported by private companies under government tender and then distributed to farmers through cooperative societies. There is anecdotal, press and survey evidence that substantial quantities of subsidised fertilizers are diverted from cooperatives and smallholder farmers to fertilizer traders, who then sell it at unsubsidised prices. There has been substantial political controversy regarding the implementation of the 2008/9 programme (Dorward, 2009).

2.5 Political Economy of Fertilizer Subsidy Programmes

Chinsinga (2007) explains that the introduction of democracy in a country is expected to fundamentally alter not only the structures but also the incentives that inform and guide policy processes. Thus in theory, voters in a democracy exchange their votes for a set of policies that respond to their interests. In that case agricultural policies should be high on political parties' agendas in countries where the majority of people live in rural

areas and depend almost entirely on agriculture for their livelihoods. The preference of direct over indirect methods of policy implementation suggests politicians prefer policies that benefit a large number of people in the short term and are highly visible such as social policies. They thus prefer to win votes by delivering clientelist privileges rather than hard to achieve 'development' or even public goods. This has influenced and shaped the manner in which the fertilizer subsidy programme has been designed, implemented and evaluated.

According to the case study done in Malawi by Chinsinga (2007), it shows that the Starter Pack (SP) programme implemented in the late 1990s was greatly used for electioneering purposes. Therefore that the fertilizer subsidy programme was widely seen as the most expedient vehicle for garnering rural political support in order to consolidate and retain the power, authority and influence of the governing elite and to pay back those who have helped fund politics. The incumbents care less about the technical viability of the policies but more about whether the policies are able to deliver desired electoral outcomes to access and maintain themselves in power. Therikildsen and Kjaer (2009) as cited in Chinsinga (2007) also show that such policies targeted countrywide, have immediate, visible results and implemented through the public sector rather than the private sector. Therefore, Chinsinga (2007) suggests that design and implementation of policies such as the fertilizer subsidy programme can be fully understood by thoroughly unpacking the configuration of power relations, incentive structures and dynamics of processes of change in a country context.

Similarly, Mason *et al.* (2017) also state that despite a burgeoning body of literature on programme impacts, the political economy of the programmes remains poorly understood. They also highlight that understanding these links is important because in addition to their stated objectives such as increasing access to inorganic fertilizer or improved seed, and improving agricultural productivity, incomes, and food security many of the programmes appear to also have significant political objectives. Moreover, the conventional wisdom in the region is that input subsidy programmes (ISPs) are an effective way to garner and maintain rural votes, and the literature on political clientelism and vote buying has tended to assume that these actions are effective in shaping voter choice.

However, contrary to conventional wisdom, Mason *et al.* (2017) have found in Zambia that marginal changes in the scale or coverage of the fertilizer subsidy programme have no statistically significant effect on the share or number of votes won by incumbent presidents. While they find no evidence of direct fertilizer subsidy programme effects on voting patterns in Zambia, it is possible that these programmes have indirect effects on voting patterns through their impacts on economic outcomes or via other

pathways. Finally, they suggest that identifying programme improvements that are economic and political win-wins may be the best path forward.

Further, Mason *et al.* (2017) have cited in their article the following quote from a newspaper to support their views.

“But there is no doubt that this Farmer Input Support Programme, which is supposed to be an economic activity, has sadly been abused or mismanaged by politicians and those seeking patronage and turned into a political tool for their election campaigns. In this election year things will be worse and it will be nothing but a campaign tool; fertilizer bought with taxpayers’ money will be exchanged for votes”. Editorial from the Post, Zambia, March 13, 2011

In addition, Banful (2011) who studied the new subsidy programme introduced in Ghana in 2008 too finds that more vouchers were targeted to districts that the ruling party has lost in the previous presidential election and more so in districts that had been lost by a higher percentage margin, and therefore concludes that there was a significant threat to the efficiency of fertilizer subsidies. Further, Weerahewa *et al.* (2010) also state that the fertilizer subsidy is a highly politicized policy intervention in Sri Lanka. The most common election promise made by the ruling and opposition parties in their election campaigns is that they will continue the existing subsidy programme or modify it to make it more favourable to farmers. The majority of voters are connected with farming either directly or indirectly, so the fertilizer subsidy has the power to make new governments or break existing governments. The political importance of the subsidy is evident from a statement made by the then Minister of Agricultural Development and Agrarian Services at a press briefing on April 1, 2010, just before the general election on April 8, 2010, that the government has shouldered a burden of Rs. 26,065 per acre for the fertilizer subsidy since 2005.

2.6 Impacts of Fertilizer Subsidy Programmes

Fertilizer subsidy programmes are attractive to many because they offer the potential to increase the food grain harvest and thus reduce hunger in the short run. Income gains transferred to farmers through the subsidy result in greater savings and investment in productive assets, contributing to longer-run growth. In addition, income transfers to farmers address the social and political objectives of poverty alleviation and improved equity (Minde *et al.*, 2008). Dorward (2009) also states that subsidy programmes have greatest (but not exclusive) potential in contributing to wider growth when applied to the production of staple grains rather than to cash crops (as a result of both the greater contribution to overcoming producer constraints on input use in staple food production and the greater benefits to consumers from their stimulus to increased production of

staples). Dorward (2009) further highlights that a key contribution of input subsidies will commonly be their contribution to consumers' welfare and real incomes through lowering food prices, while also benefitting producers. However, this requires very large scale implementation to bring prices down (perhaps below import parity) with substantial costs and risks and a strong emphasis on wider pro-poor dynamic growth objectives and complementary investment and output market development policies.

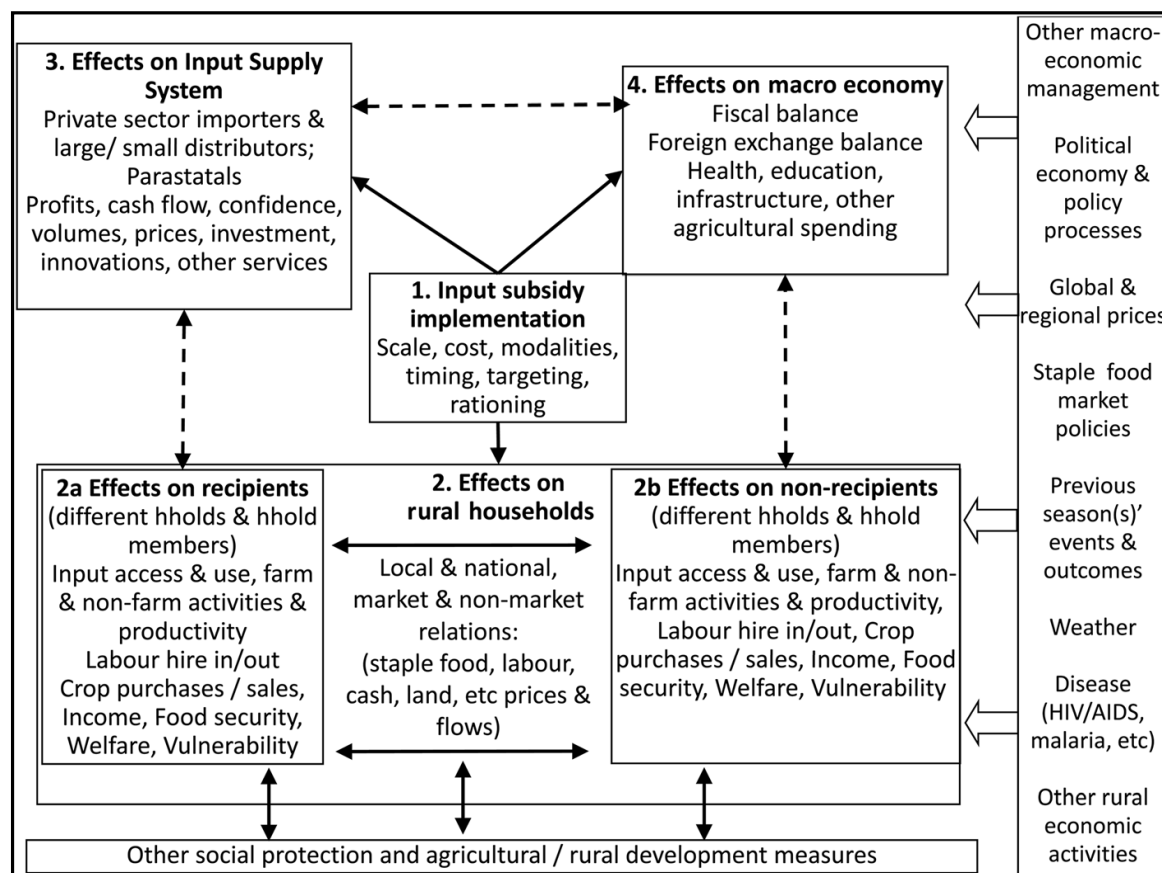
On the other hand, many agricultural scientists argue that increasing fertilizer use is the key to increasing productivity in agriculture and that subsidies may be necessary to do so (Holden and Lunduka, 2012). Agreeing to that Dorward and Chirwa (2011) state that in the mid-1990s, there were widespread perceptions that falling fertilizer support was leading to declining maize production and a food and political crisis. Further, Evenson and Gollin (2003) cited in Carter *et al.*, (2013) show that the use of improved seeds and fertilizer contributed to large productivity gains in many parts of the developing world over the last 50 years. According to their study conducted in Mozambique, farmers who received subsidies have used 15kg more fertilizer and three kg more improved seeds than did the control group.

Dorward and Chirwa (2011) show that in Malawi, the subsidy programme has resulted in substantial increase in maize production leading to food security increases and exporting some maize. According to a study by Sheahan *et al.* (2016), between 1997 and 2010, the estimated 27 percent reduction in real fertilizer prices led to a 36 percent increase in nitrogen use on maize fields and a nine percent increase in maize production resulting in from both yield and acreage effects. Chand and Pandey (cited in Wijetunga and Saito, 2017) show that in India, if subsidy on fertilizer is removed completely, the price of fertilizer will increase by 69 percent and this would cause a nine percent reduction in food grain production. At the same time Sharma and Thaker (2010) cited in Wijetunga and Saito (2017) find that reduction in fertilizer subsidy is likely to have an adverse impact on farm production and income of small and marginal farmers and un-irrigated areas since small and marginal farmers have a large share in cultivated area in India.

Further, Akpokoand and Yiljep (2001) show that under a fertilizer deregulated system, although fertilizers were supposed to be sold at fixed government rates, most farmers paid prices far above the government rates. According to their study, about 78 percent of the respondents indicated that fertilizers have become too expensive and beyond reach of small-scale maize producers. As a result, while 47 percent had reduced the dosage application per hectare, 80 percent of the respondents had reduced their land extent and 39 percent had shifted to local maize varieties and other crops that were less responsive to high levels of fertilizers. Similarly, Sharma (2012) has also states that full decontrol of fertilizer prices may lead to a very high increase in prices and affect farm

incomes and agricultural production. Further, a reduction in fertilizer subsidy is likely to have an adverse impact on farm production and income of small and marginal farmers and un-irrigated areas as they do not benefit from higher output prices but do benefit from lower input prices.

However, achieving these benefits depends greatly on how the programmes are implemented. The contribution of fertilizer subsidy programmes in reducing poverty and hunger would be higher if they could be designed and implemented so as to (a) target households with little ability to afford fertilizer; (b) target areas where applying fertilizer can actually increase total output; and (c) promote rather than undercutting the development of a commercial fertilizer distribution system (Minde *et al.*, 2008). Figure 2.1 shows the impact of input subsidy programmes in a holistic picture and it is mainly relevant to the African context. However, the core of the presentation is applicable to any developing country.



Source: School of Oriental and African Studies *et al.* (2008)

Figure 2.1: Direct and Indirect Subsidy Impacts

In contrast, though input subsidies have played an important role in successful agricultural development in the past, offering major potential gain when effectively applied to overcome market failures constraining growth in poor rural areas, they are also carrying substantial risks of costly, ineffective and inappropriate design and implementation using large amounts of scarce government and national resources for little gain (Dorward, 2009). As stated by Rodrigo and Abeysekera (2015), due to the availability of subsidised fertilizer, farmers have been found to overuse it, resulting in numerous negative environmental externalities such as soil degradation, surface water pollution and groundwater pollution and increased concerns about food security through subsidiaries. As such, excess use of fertilizers in agriculture is found to have a significant impact on the economy, society and broader environment of a nation. Further, Holden and Lunduka (2012) have investigated whether fertilizer subsidies have affected organic manure use in central and southern Malawi and have found that a higher average fertilizer price was associated with a higher probability and intensity of manure use.

Further, Jayne and Rashid (2013) show that the costs of fertilizer subsidy programmes generally outweigh their benefits and indicate that at least a partial reallocation of expenditures from fertilizer subsidies to research and development and infrastructure would provide higher returns to agricultural growth and poverty reduction. However, because subsidy programmes enable governments to demonstrate tangible support to constituents, they are likely to remain with them for the foreseeable future. Hence, they suggest benefits can be enhanced through changes in implementation modalities and complementary investments within a holistic agricultural intensification strategy. Among the most important of these are efforts to reduce the crowding out of commercial fertilizer distribution systems and programmes to improve soil fertility to enable farmers to use fertilizer more efficiently.

2.7 Limitations in Fertilizer Subsidy Programmes

Chinsinga (2007) shows that the implementation of the programme without any regulatory system in place would have led to a situation in which major beneficiaries of the programme would have been the big farmers and informal traders who do not necessarily require such kind of support. Holden and Lunduka (2010) show that lack of transparency and lack of accountability in the administrative distribution appears to breed conflicts. The unclear targeting criteria and exclusion of some households for unclear reasons appeared to frustrate a lot of people. A clearer targeting policy, like one coupon for basal fertilizer for every resident rural household, based on a publicly displayed list of resident households for open validation in every village, and based on the recent population census appears as an attractive alternative targeting strategy.

Banful (2009) shows in his study in Ghana that poor planning and poor timing have resulted in not achieving the objectives of the programme. Therefore, during the peak fertilizer application periods, the subsidised fertilizer was not available. Therefore, poor timing, shortage of fertilizer and a small network of fertilizer retailers participating in the programme prevented fertilizer use and amidst such constraints, less than 50 percent of the vouchers country-wide had been redeemed by the end of the planting seasons. In addition, there was evidence that some farmers delayed applying fertilizer so much so that its effectiveness was reduced. Another limitation was that the subsidy programme did not call for targeting of the voucher to farmers based on their income or the crop they cultivated. In addition, all the stakeholders have complained about the physical stress of dealing with vouchers. District agricultural directors had to spend hours signing hundreds of vouchers. The farmers also had a hard time locating their extension agents and many of them stormed the agriculture offices to demand vouchers from whomever they saw. The extension agents had to contend with long-lines of impatient farmers whilst they filled out the name of the farmer, and their own names on each voucher given out. Extension agents in all the districts complained of shortage of vouchers at the time that they were most needed.

Further, Druilhe and Barreiro-Hurlé (2012) also state that late delivery of subsidised fertilizers or vouchers led to regular shortages and queues. Dorward and Chirwa (2011) show that fraud may arise through voucher allocation to nonexistent/'ghost' beneficiaries or villages, diversion to others (government staff, traditional leaders or politicians), direct allocation to non-beneficiaries and printing of extra or counterfeit vouchers. In addition, Holden and Lunduka (2010) also show in their study that the Ministry of Agriculture and Food Security, Malawi has not been able to control the distribution of coupons well. Leakages have therefore occurred at many levels. Targeting particularly poor, vulnerable (child-headed, female-headed, orphan headed, guardian), and land-owning households, was difficult as it was not clear how to interpret these targeting criteria. A significant smaller share of female-headed households received a full package of fertilizer than that of male-headed households. Overall, it is therefore not very clear that the administrative targeting system is much more efficient in targeting poor and vulnerable households than a general subsidy of fertilizer would be. Furthermore, the administrative targeting system frustrated many respondents because of the corruption and conflicts associated with the administrative distribution.

Chinsinga (2007) argues that the implementation of the universal fertilizer subsidy in Malawi has led to economic disaster since government would be forced to spend beyond its limits. However, politicians were demanding universal fertilizer subsidy without prescribing the source of funds. He further argues that universal subsidy would lead government to borrow on the domestic market which in turn would put pressure on inflation and interest rates. An additional concern was that the government was

implementing the programme without fully thinking about corresponding interventions to deal with marketing issues in case of produce surplus. In the absence of such mechanisms, the argument is that the subsidy programme risks creating disincentives in agriculture production. With regard to India's direct cash transfer programme, as mentioned by Kapur *et al.* (2008), the poor people tend to misspend some of the money they receive. However, it would relieve financial constraints faced by the poor, many of whom turn either to usurious money lenders or to micro credit institutions. In Nicaragua, Maluccio (2010) finds that nearly all the transfer from Red de Protección Social is used on consumption and education with little spending linked to agricultural or non-agricultural activities.

A review of number of input subsidy programmes in Africa done by Dorward (2009) shows that there is limited implementation of important aspects of smart subsidies and weaknesses in design and implementation. There is also a lack of emphasis on improving programme effectiveness and efficiency and inadequate attention is paid to integration with complementary policies and programmes for improving achievement of both direct and indirect benefits of input subsidy programmes. Some programmes appear to be unfortunate due to limited monitoring, evaluation and audit systems, limited cost benefit and fiscal efficiency analysis and limited attention to possible problems of displacement and leakage. This may be related to political economy issues. It is important that governments improve the efficiency and effectiveness of input subsidy programmes in both raising productivity and promoting wider pro-poor growth within and beyond agriculture. Two notable commonalities observed across programmes are the lack or limited focus on replenishing soil fertility and a strong (almost universal) prevalence of heavy subsidies on rationed inputs. This commonality occurs despite differences between programmes with regard to first relative emphasis on improving national food security (and total input use and production) as against improving household food security (and helping food insecure households) and second relative emphasis on supply system development.

2.8 Best Practices for Fertilizer Subsidy Programmes

A list of cautions to be taken into account before considering fertilizer subsidies as mentioned by Minde *et al.* (2008);

- Fertilizer subsidies may not be the best option for addressing the current crisis of high food and fertilizer prices. Thus, implementing large-scale fertilizer subsidy programmes will not guarantee an adequate harvest. Subsidies targeted to particular crops may drop the output of other food crops reducing the net food supply response.
- As a tool for increasing overall agricultural productivity, especially for small, poor farmers, fertilizer subsidies have a questionable record. Long

experience with input subsidy programmes in Africa is not encouraging on several points:

(a) there is very little evidence from Africa that fertilizer subsidies have been a sustainable or cost-effective way to achieve agricultural productivity gains compared to other investments,

(b) there are no examples of subsidy programmes where the benefits were not disproportionately captured by larger and relatively better-off farmers, even when efforts were made to target subsidies to the poor, and

(c) there is little evidence that subsidies or other intensive fertilizer promotion programmes have productivity growth among poor farmers in Africa enough to sustain high levels of input use once the programmes end.

- iii. In the less stable production zones of Kenya, Zambia and Malawi, low or no fertilizer use by many smallholders is explained not just by credit constraints that limit acquisition, but also by the risk of crop failure, with resulting financial losses and consumption shortfalls. The lack of insurance causes inefficiency in production choices. Recent trials of weather-indexed insurance are a promising potential solution for the risk problem.
- iv. Hence, a balance is needed between interventions to address short-term supply shortages and avoid widespread hunger vs. investments and policies to drive growth and lift poor households out of the poverty trap in which they are caught.

Chinsinga (2007) shows that to a very great extent that policies often fail because their design is not well grounded in the country's reality. Therefore, policy assessments need to be built on solid context specific analyses. There is thus need to fully grasp the messy hidden politics of policy and implementation in order to generate realistic policy responses and outcomes. This requires a thoroughly grounded approach, rooted in context specific constraints, allowing for scenarios and options to be elaborated and debated by the multiple stakeholders in the agricultural policy processes. In that context, a number of key lessons have been highlighted by Chinsinga (2007), which are presented below.

- i. The domestic political economy context matters in any agricultural policy process. There are unique circumstances of each country that have to be taken into account in policy formulation. A strident policy against subsidies (or any other policy measure) is inappropriate. Moreover, 'second-best' options that work given the peculiarities of contexts are certainly preferable to one-size-fits all dogmatic policies presented as 'first-best'.

- ii. Policy designers and donors in particular need a deeper awareness of political economic history of agriculture and with this the nature of the implicit 'social contract' between smallholders and the state and of the importance of state organisations in providing in times of need.
- iii. There is need to grasp fully the array of stakeholders and their interests, competing views and demands in policy issues. Understanding how various interests play out is critical for analyzing potential tradeoffs in the policy process. Assuming that policies emerge from technical reasoning and first principles economic theory will result in policy failure.
- Government leadership and determination backed up by a democratic mandate means that there must be a culture of pragmatism, negotiation and compromise among donors, who often are used to getting their own way. Electoral mandates and popular support are critical for any meaningful policy-making process and so require respect.
- Donors should not only understand the political context of the countries where they operate but also that they should be more reflexive in their reading of that reality and the role they play in it.

In addition, other suggestions made by Chinsinga (2007) were

- i. greater involvement of the private sector in both the procurement and the distribution of subsidised fertilizer and other farm inputs,
- ii. promotion of choice among beneficiaries in terms of the range of fertilizers involved and outlets from where fertilizers and seeds are procured,
- iii. extension of the subsidy intervention to other crops in order to promote crop diversification and
- iv. developing plans for marketing and storage especially during times of excess production.

Dorward and Chirwa (2011) state that for a large-scale subsidy programme to realize its potential benefits, its design and implementation need to be effective, efficient and sustainable. In that context they discuss the following key and often interrelated issues;

- i. **Focus:** subsidies should be focused on inputs for important staple crops with a high potential response to input use constrained by market, profitability and affordability conditions and with emphasis on both consumer and producer gains.
- ii. **Scale:** sufficient local or national scale is needed for the subsidy to affect staple crop prices and/or labour markets, but the scale also has to be limited to control costs so that the programme is affordable and efficient, funds limit displacement and does not crowd out critical complementary investments.

- iii. **Effective targeting and rationing systems** must control costs, reduce displacement and improve subsidy impacts on incremental production and land and labour productivity. Targeting may use geographical or household approaches, with varying costs and practical and political feasibilities, but universal provision, with rationing, may also be practicable, effective and efficient.
- iv. **Entitlement systems** should be robust for effective targeting and rationing. Paper vouchers must be secure against counterfeiting and diversion. Smart cards and other electronic systems linked to debit cards and/or mobile phone-based financial transfer systems are becoming increasingly practical and have many potential advantages, but side effects of their implementation need careful consideration.
- v. **Logistical systems** face major challenges in coordinating targeting, entitlement, input distribution and purchases for timely, low-cost and easily accessed delivery of small quantities of subsidised inputs to large numbers of dispersed farmers. Major investments are needed to build human and physical capacity for development and operation of these systems.
- vi. **Input supply system development** requires close attention to the complementary and changing roles of different public sector and commercial stakeholders and to institutions and for that fostering the development of trust and of transparent and stable policies encouraging private sector investments and activities.
- vii. **Performance monitoring, information and audit systems** are essential for developing trust, controlling costs and fraud and establishing incentives for engagement by public sector, commercial, civil society and political stakeholders. Malawi's experience demonstrates the importance of reliable information not just on programme implementation but also on much larger issues such as national population and production statistics.
- viii. **Complementary policies and investments:** the impacts of a large-scale subsidy programme depend on a range of complementary investments and policies promoting infrastructure development, staple market development and stability, agricultural research and extension, and economic diversification in rural areas.
- ix. **Macro-economic management** must promote a good investment climate, favourable conditions for growth and budgetary resources to support the programme.
- x. **Political commitment** is essential for the mobilization of the substantial resources required for large-scale subsidy programmes in poor countries where such programmes have the most potential. However, the need for

patronage to garner broad based and sustained political support may conflict with the targeting, rationing, cost control and auditing required for economically efficient and sustainable programmes.

- xi. **Stability, flexibility and innovation** are all needed – stability to provide stakeholders with confidence and security (to justify long-term financial and other investments associated with the programme’s implementation and realisation of long-term objectives); flexibility to adjust to changing conditions (in international and national markets, in weather and climate, in politics and in the national economy) with some changes in the direct or indirect and anticipated or unanticipated result of the programme; and innovation (in systems, in technology and in prices) to take advantage of learning and change during programme implementation. However, flexibility and innovation can undermine stability, so there must be stable principles governing both long-term objectives of and relations between different stakeholders on the one hand and processes for learning, flexibility and innovation on the other.

If the decision is made to implement input subsidies, Minde *et al.* (2008) also provide several practical guidelines for how to maximize effectiveness in meeting important national objectives other than economic growth, such as improved national food security, alleviation of poverty and hunger based experiences of Zambia and Malawi are presented below.

- i. **Use input vouchers that can be redeemed at local retail stores rather than direct distribution** in order to maintain or improve the capacity of the private sector input delivery system.
- ii. **Involve a wide range of fertilizer importers, wholesalers and retailers in the input voucher scheme**, even if it entails additional logistical costs.
- iii. **Before deciding to target the input vouchers**, carefully consider the objectives of the targeting and the practical feasibility and costs of implementing a targeted programme, including personnel costs, time requirements and potential delays, leakage and displacement of commercial sales by subsidised inputs.
 - a. If the objective is to increase total output, then the inputs need to reach farmers who can use them efficiently and on a large enough area to generate significant gains in total output.
 - b. If the objective is to alleviate poverty, or to overcome liquidity constraints for poor farmers who would otherwise be unable to purchase fertilizer, then it must be possible to identify poor farmers, and socially acceptable to channel vouchers to them, at a reasonable cost including leakage.

- c. If effective targeting does not seem feasible or achievable at an acceptable cost, then a small universal voucher programme would be worth considering.
- iv. **Address infrastructure and input supply constraints as well as improving procurement efficiency.** This will help achieve the goal of enhancing farm-level fertilizer supplies at a lower price. Facilitating the movement of fertilizers across borders will also contribute to overall improvements in supply efficiency.
- v. **Facilitate private sector partnerships with farmers,** such as through contract farming where conditions are suitable, would go a long way toward reducing the financial burden on government.
- vi. **Strengthen farmers' effective demand for fertilizer** by making fertilizer use profitable and by building durable input markets and output markets that can absorb the increased output without gluts that depress producer prices.
- vii. **Increase fertilizer use efficiency** by promoting farmers' use of improved crop management practices, improved soil organic matter, early planting, timely weeding, applying fertilizer in response to rainfall, water harvesting, and other conservation farming methods.

In addition, as reviewers of the fertilizer subsidy programmes, Druilhe and Barreiro-Hurlé (2012), also suggest the following to be implemented to make the programmes more efficient.

- i. Policymakers should develop targeted packages of fertilizer subsidies for a variety of agro-ecological contexts and farming systems and combine those with complimentary services such as extension, seed supply etc. before delivering it to the targeted farmers.
- ii. Even with subsidies, profitability in farming might not be achieved in all contexts. Sustainable benefits of the fertilizer subsidies can be gained only through improving the fertilizer use efficiency. High efficiency in fertilizer use can be achieved through improved agricultural practices.
- iii. Fertilizer should be identified as a tool to improve soil health and fertility management. Therefore, fertilizer subsidy programmes should be run simultaneously with programmes promoting best management practices related to agronomic aspects. Farmers should be made aware of the benefits of organic and inorganic fertilizers, site-specific nutrient management, balanced fertilization, soil properties, crop diversification that enhances soil fertility etc.
- iv. Secured entitlement systems should be used such as vouchers, smart cards, mobile phone based systems to reduce fraud.

Holden and Lunduka (2012) in a different perspective suggest that finding ways to reduce the dependence on fertilizer imports by better using substitutes, like organic manures, may be a better strategy. The use of organic manure (including crop residues, tree leaves, green manure, compost and animal manure) may prevent soil fertility decline. However, there are limitations attached with organic manure usage such as high labour demand in preparation, transportation and application, scarcity of easily available organic matter and the much lower nutrient concentration in organic manure than in inorganic fertilizers. Where animals are few, alternative sources of organic manure are used including crop residues, tree leaves, grasses, green manure and household refuse.

2.9 Fertilizer Subsidy Programmes: The Sri Lankan Context

As in many developing countries, subsidy of fertilizer is a major agricultural policy in Sri Lanka, with the paddy sector being the predominant recipient. Paddy cultivation is one of the major sources of livelihood in Sri Lanka, providing employment to more than 1.8 million people. Therefore, in terms of ensuring the food security and reducing unemployment, the government is under constant pressure to continue with the agricultural subsidy programmes. Since 2005, the fertilizer subsidy has accounted for 2-2.5 percent of total government expenditure, as the subsidy is given for all the three major fertilizer components. Over the past three decades, the subsidy has significantly contributed to increasing paddy production, stabilizing the price of rice and in achieving self-sufficiency in the production of rice in Sri Lanka (Weerahewa *et al.*, 2010). Currently, most of the country's required inorganic fertilizer is imported.

Weerahewa *et al.* (2010) show that the general public, including farmers, are of the view that the government is responsible for providing agricultural inputs, particularly fertilizer, at a low cost (despite the fact that a considerable number of relatively well-off public servants who cultivate paddy on a part-time basis also receive the subsidy). Interviews carried out with farmers reveal that the fertilizer subsidy is the only relief they have in terms of cutting the ever-increasing cost of production. A withdrawal of the subsidy would push paddy farmers into low-income brackets, further worsening the situation. Similarly, Wickramasinghe *et al.* (2010) reveal that in 1990 and 2003 with increasing urea prices almost doubled, use of total urea had dropped by nearly 30 percent and 25 percent respectively at national level. However, area under cultivation remained almost unchanged. Further, value of loans issued by the *Govijana* banks to farmers amounted to Rs. 25 million in 1999 and increased to Rs. 366 million in 2003 consequent upon the higher fertilizer prices and then dropped to Rs. 226 million in 2006 with the introduction of the subsidy programme. Therefore, obviously the number of farmers depending on credit for fertilizer input has come down after the subsidy

programme and many have become independent of settling their dues from their harvest (Wickramasinghe *et al.*, 2010).

On the other hand, Wijetunga and Saito (2017) state that urea use at the national level increased from 4.36 kg/ha in 1965 to 284 kg/ha in 2005. Meanwhile, the average fertilizer usage for paddy increased from 140 kg/ha in 1961 to 386 kg/ha in 2012 contributing to the improvement in paddy yield. The main factor for the rapid diffusion of fertilizer among the farmers can be attributed to its relative low price. The subsidy leads to a significant drop of the paddy farmers' share of fertilizer price which accounts for three percent of the total cost. Confirming that, a research study by Ekanayake (2005) finds a positive relationship between the average annual fertilizer consumption by farmers and paddy production in the study period and prompting him to conclude that the average annual paddy production in Sri Lanka has increased over time with the increasing use of fertilizer.

Further, Henegedara (2002) also shows that the fertilizer subsidy has a positive effect on productivity and total production of paddy with a significant impact in the case of high yielding varieties which use urea. However, the impact of reducing total production cost was marginal since the fertilizer accounted for only 12 percent of the total cost. However, the subsidy helped increase fertilizer application among small producers who could hardly bear the high production costs.

In addition, according to the results of the study of Wickramasinghe *et al.* (2010), farmers had been using fertilizer mixtures prior to the subsidy programme in 2005 and thereafter, farmers had commenced using straight fertilizer recommended by the Department of Agriculture for it was deemed to be a strategy to increase fertilizer use efficiency in paddy cultivation. Further, issuing fertilizer on prescribed level with the introduction of the programme in 2005 has driven them towards adopting the department recommendation. On the other hand farmers who had not applied the full dose of recommended levels of fertilizer before the subsidy have reported to that practice after the programme.

However, according to many studies, several shortcomings of the fertilizer subsidy programmes have been reported. Tibbotuwawa (2010) highlights that many benefits were reported by relatively wealthy farmers if the subsidy was given out without a targeting mechanism. This study further notes that a large proportion of farmers do not receive the fertilizer at the subsidised price and a substantial amount is diverted to the black market as a result of the weaknesses in targeting, combined with rent seeking at various stages in the distribution chain. On the other hand, Central Bank (2014) shows that existence of two methods of subsidies as Rs.350/50 kg for paddy and Rs.1,250/50kg for other crops resulted in paddy farmers selling fertilizer at a higher price which leads

to lower utilization of fertilizer in paddy sector than the purchased amount under the subsidy price. In addition, Wijetunga (2013) further states that there were some misallocations in the subsidy programme as the total amount of fertilizer issued was much higher than the total area of paddy lands entitled for the subsidy. World Bank (2015) also reports that the intensive use of low quality fertilizer in Sri Lanka leads to environmental and potential human health hazards. Thus it affects the bottom 40 percent of people who are directly or indirectly engaged in agriculture. Further, according to Jayasumana *et al.* (cited in Wijetunga and Saito, 2017) the quality of fertilizer imported became questionable in the recent years while some research findings reveal that low quality of chemical fertilizer is the reason behind the increasing number of kidney diseases in areas where paddy is cultivated.

Meantime, Wijetunga and Saito (2017) cast doubt on the cost-effectiveness of the programme since the government was spending between Rs. 1.4 and 2.4 per acre to increase farm income by only one rupee per acre. Weerahewa *et al.* (2010) also show that in 2008 with the world market price of fertilizer spiraling significantly, the subsidy allocation was exhausted within five months requiring the government to go for another US\$276.93 million (Rs. 30 billion) through a supplementary budget. However, Wijetunga and Saito (2017) state that the fertilizer subsidy programme in the country is less efficient in economic terms, however, alterations can hardly be made because of the political sensitiveness of the programme. It was observed that shortly after the government proposed a system of substituting fertilizer with direct cash transfer in 2016.

Further, a survey of literature reveals that many research studies have made proposals for improvement of the fertilizer subsidy programme in the country. Ekanayaka (2005) recommends using a simple regression method to estimate demand functions for the three main fertilizers subsidized and addresses that changes in the price of fertilizers and the price of paddy had little impact on the demand for fertilizer. The study further finds that the demand for fertilizer is relatively inelastic to the prices of fertilizer, seed paddy and labour. However, the price of seed paddy has a greater impact in sustaining paddy production in Sri Lanka than the fertilizer subsidy. Therefore, measures are required for the stabilisation of seed paddy prices. In addition, policy measures need to be focused for at least two to three years (short-term), rather than a single cultivation season, as done in the recent past. Based on these findings, Ekanayaka (2005) concludes that the fertilizer subsidy should be gradually phased out and the public policy which centres on subsidy should rest on the price of paddy output. The removal of the fertilizer subsidy brings about two noteworthy advantages for the farmers to adopt more organic fertilizer and allow the private fertilizer market to develop. However, the paddy farming sector is unlikely to operate with minimum state support and to determine the prices and the quantity of fertilizer through market forces is the

foreseeable future. Wickramasinghe *et al.* (2010) also show that the main fertilizers used in paddy cultivation are inelastic to its own price and there are other determinants of fertilizer use besides the price. The demand increases as the irrigated area increases with favourable weather and per hectare fertilizer demand is high in irrigated areas. When the paddy prices are relatively high, there is an incentive for the farmers to use more fertilizer to increase yield and bring more lands under cultivation. Fertilizer price becomes the next important factor determining fertilizer use.

A study by Cooray (2014) to analyse and to quantify the impact of fertilizer subsidy policy on paddy using simulations equations shows that if the government reduces the fertilizer subsidy or increases the price of fertilizer by 10 percent, paddy yield, local rice supply and paddy sector value addition to total GDP will result in insignificant negative impacts. Therefore, the government of Sri Lanka can systematically eliminate the fertilizer subsidy allowing market forces to work effectively. Hence, it is recommended to consider it in terms of economic rationale rather than justifying it for political reasons.

In this context, it is noted that many studies have been undertaken with respect to fertilizer subsidy programme since its inception to 2015. However, the implementation strategy introduced in 2016 has not been studied critically and hence this study is a timely intervention.

CHAPTER THREE

Methodology

3.1 Introduction

This chapter presents the research design, tools, study locations and data analysis in detail.

3.2 Research Methods

Design

A descriptive study was carried out and both qualitative and quantitative data was collected. Participatory approach based on the views of those benefiting from the intervention and of those implementing the programme was used to collect data. The primary data collecting tools were key informant interviews, a sample survey, case studies and focus group discussions. The secondary data sources were National Fertilizer Secretariat, Department of Census and Statistics, Department of Agriculture, the Central Bank and other relevant journals, periodicals and reports. In addition, a comprehensive literature review was conducted to supplement the study findings. Primary data was collected during the period September to December, 2017.

Key Informant Interviews

Key informant interviews were carried out with the following officials using a guide: District Secretaries, Additional District Secretaries, District Assistant Directors (Fertilizer), Agrarian Development Deputy Commissioners, Agrarian Development Assistant Commissioners, Agrarian Development Divisional Officers (DOs), Agrarian Development Officers and Agriculture Research and Production Assistants with respect to the locations identified for the sample survey.

The Sample Survey

The survey was carried out mainly on respondents' recalled data. Multi-staged random sampling technique was used to identify the respondents of the survey. A pre-tested structured questionnaire was used to collect data. At the first stage, the crop entitled for the FCG programme was considered, considering the two categories paddy and other filed crops.

The districts for the survey on paddy were selected based on agro-climatic zones (i. low-country dry and intermediate zone, ii. mid-country wet, up-country dry and high altitude low and up country zone, iii. up-country wet zone and iv. low-country wet zone),

irrigation schemes (i. major irrigation, ii. minor irrigation and iii. Rain-fed), extent of paddy lands and the number of farmers benefitted. The selected districts for the survey were Ampara, Kurunegala, Anuradhapura, Polonnaruwa, Matara and Kilinochchi. Attempts were taken to represent all the categories of farmers in the survey assuming that the performances and behaviour of farmers vary based on the agro-climatic zone and irrigation scheme. The basis of selecting the districts is explained in Table 3.1.

Thereafter, one Agrarian Services Centre from each district with respect to the irrigation scheme was selected based on the highest concentration of beneficiaries/farmers of the FCG programme. Finally, three *Grama Niladhari* (GN) divisions from the selected Agrarian Services Centre were selected based on the same considerations to prepare the sample frame. The beneficiary lists available at the National Fertilizer Secretariat were used to make the sample frame. At the same time, beneficiaries who had obtained FCG in 2016/17 *Maha* season were considered. According to the data from the National Fertilizer Secretariat (NFS), 812,587 paddy farmers have received the Fertilizer Cash Grant in 2016/17 *Maha* season. According to the Survey Random Sample Calculator, the appropriate sample size for a population of 812,587 is 272 with a 90 percent confidence level. Therefore, a sample of 270 persons was appropriate for the survey. Hence, 15 beneficiaries were selected randomly from each selected GN division to administer the questionnaire and resulted in a total sample size of 270 covering six districts. Table 3.2 presents the selected Agrarian Services Centres and *Grama Niladhari* (GN) divisions with their respective agro-climatic zones and irrigation schemes.

Table 3.1: District Selection Process for the Survey with Paddy Farmers

Zone	District	% of the Total Paddy Land Extent (Avg: 2007-16)	No. of Farmers Benefited from FCG Programme in 2016/17 Maha Season	Selected District	Irrigation Scheme	Reasons for the Selection
Low-country dry and intermediate zone	Kurunegala	12	115,598	75% of the total extent comes under this Zone. Therefore, five districts have been selected to represent the zone.		
	Ampara	12	74,630			
	Anuradhapura	11	102,986			
	Polonnaruwa	11	65,742	Ampara	Major	The first highest extent (12%), the third highest No. of farmers
	Batticaloa	7	36,498			
	Hambantota	5	41,220	Kurunegala	Minor	The second highest extent (12%), the highest No. of farmers
	Moneragala	4	45,810			
	Trincomalee	4	40,729			
	Puttalam	3	19,407			
	Kilinochchi	2	15,337	Anuradhapura (Mahaweli)	Major	The third highest extent (11%), the second highest No. of farmers
	Mannar	1	14,788			
	Vavuniya	1	17,551	Polonnaruwa	Rain-fed	The fourth highest extent (11%), the fourth highest No. of farmers
	Mullaitivu	1	12,848			
Jaffna	1	16,295				
				Kilinochchi	Major	To represent 30-year war affected districts
Low-country wet zone	Matara*	3	15,933	Matara	Rain-fed	The highest extent (3%), the second highest No. of farmers
	Ratnapura*	2	19,376			
	Kalutara	2	13,556			
	Galle	2	10,616			
	Gampaha*	1	14,025			
	Colombo	1	4,660			
Mid-country wet, up-country dry and high altitude low and up country zone	Badulla*	3	48,324	No district was selected as the extent under this agro-climate zone was only 9% of the total extent.		
	Matale*	3	29,965			
	Kandy*	2	26,256			
	Kegalle	1	10,437			
Up-country wet zone	Nuwara Eliya	1	NR	No district was selected as the extent under this agro-climate zone was only 1% of the total extent.		

Note: *All the Divisional Secretariat Divisions belong to these districts do not represent the particular agro-climatic zone, but the majority of Divisional Secretariat Divisions.

Table 3.2: Study Locations – Paddy Farmers

District	Agro-climatic Zone	Agrarian Services Centre	<i>Grama Niladhari</i> Division	Irrigation Scheme
Anuradhapura	Low-country dry and intermediate zone	Thambuththegama	Kelegama	Major
			Mudungoda	
			Pahalagama	
Ampara		Dehiattakandiya	Serupitiya	Major
			Kadirapura	
			Dehiattakandiya	
Kilinochchi		Kilinochchi	Maruthanagar	Major
			Periyaparanthan	
			Uriyan	
Kurunegala		Panduwassuwaruwa	Yayegedara	Minor
	Akurana			
	Hindagahawewa			
Polonnaruwa	Medirigiriya	Wadigewewa	Minor	
		Kahambiliyawa		
		Ekamuthugama		
Matara	Low-country wet zone	Deniyaya	Pallegama (North)	Rain-fed
			Beliattakumbura	
			Kolawenigama	

With respect to other field crops, the type of crop (i. potato, ii. onion, iii. chilli, iv. soya bean and v. maize) was considered in the first stage and a district was selected to represent each crop. Ten year (2007-16) average data on the extent cultivated and the number of farmers in 2016 were used to select the districts to represent the crop. The district selection process is explained in Table 3.3. The selected districts for the survey were Badulla (potato), Jaffna (red onion), Anuradhapura (big onion, soya bean and chilli) and Moneragala (maize).

Table 3.3: Selected Districts for the Survey with Other Field Crop Farmers

Crop	District	% of the Total Land Extent (Avg: 2007-16)*	% of the Total Number of OFC Farmers (2016)
Potato	Badulla	70	28
Big Onion	Anuradhapura	24	14
Red Onion	Jaffna	25	13
Chilli	Anuradhapura	21	14
Soya bean	Mahaweli- H	65	14
Maize	Moneragala	27	6

Note: *The selected districts represent the first highest percentage except in Jaffna for red onion, Anuradhapura for Big onion and Moneragala for maize. The second highest percentages were recorded in Jaffna and Anuradhapura. As the number of farmers in Puttalam for red onion and Matale for big onion which were the highest percentage in extent had only five percent and less than one percent of farmers respectively, the second highest percentages in extent was selected for those two crops. For maize, Moneragala is the second highest extent.

However, it was noted that the number of farmers who have obtained the FCG for big onion, soya bean and chilli was very limited in Anuradhapura in 2016. Therefore, Jaffna district was selected to survey the chilli farmers and big onion and soya bean farmers were not covered in this study. Therefore, finally, three districts have been covered by the study; Badulla (potato), Jaffna (red onion and chilli) and Moneragala (maize). Thereafter, one Agrarian Services Centre from each district was selected based on the highest concentration of beneficiaries/farmers of the FCG programme. Finally, two *Grama Niladhari* (GN) divisions were selected based on the highest concentration of beneficiaries to prepare the sample frame. The beneficiary lists available at the National Fertilizer Secretariat were used to make the sample frame, and the beneficiaries who had obtained FCG in 2016 were considered. Thereafter, 15 beneficiaries were selected randomly from each selected GN division to administer the questionnaire. Therefore, the total sample size was 120 covering four crops in three districts. Table 3.4 presents the selected Agrarian Services Centres and *Grama Niladhari* (GN) divisions with respect to the selected four crops.

Table 3.4: Study Locations – OFC Farmers

District	Agrarian Services Centre	<i>Grama Niladhari</i> Division	Type of OFC
Moneragala	Siyabalanduwa	Samanalabedda	Maize
		Newgala	
Badulla	Uva-paranagama	Medawela	Potato
		Pannalagama	
Jaffna	Puttur	Puttur East	Onion
		Valalai	
Jaffna	Chawakachcheri	Keppeli	Chilli
		Tavalai Iyattalai	

Focus Group Discussions (FGDs)

Two types of FGDs were conducted: (i) with the farmers/direct beneficiaries (ii) with the officials of the FCG programme. A guide was used to conduct FGDs.

Data Analysis

Data and information collected from various sources mentioned above were subjected to a descriptive analysis. The information collected using interviews and discussions was classified, analysed, summarized and presented using text and narrative formats. Data generated by the sample survey were analysed using the software package, SPSS version 16.0 for Windows. Frequency tabulations, cross tabulations, graphs and descriptive statistics such as percentages were used for data analysis.

CHAPTER FOUR

Fertilizer Subsidy Programmes in Sri Lanka and Implementation Strategies

4.1 Introduction

This chapter attempts to provide a detailed description on the history of the fertilizer subsidy policy in Sri Lanka and explains different programmes and strategies implemented time to time. Thereafter, the policy and the implementation strategy of the Fertilizer Cash Grant (FCG) Programme introduced in 2016, the focus of this study and the Fertilizer Subsidy programme implemented from 2005 to 2015, the immediate programme prior to FCG programme are presented in detail. Later, a brief account is provided on the fertilizer recommendations given by the Department of Agriculture as it was one of the bases for the subsidy in the recent past. Finally, a brief description on organic fertilizers, an alternative to inorganic fertilizers and new trends in fertilizer applications are also presented.

4.2 Fertilizer Subsidy Policy in Sri Lanka

The agriculture sector plays an important role in the economy of Sri Lanka. The majority of the people in rural areas earn their livelihood from agricultural and related activities. The agricultural sector consists of two sub sectors, the non plantation or domestic food crop sector and the plantation sector. The non plantation sector mainly consists of paddy, other food grains, maize, soybean, vegetables and perennial crops while the plantation sector consists of tea, rubber and coconut. Paddy is the staple food crop and more than 70 percent of paddy farmers belong to the 'small farmers category' where each owns less than a hectare of land.

In line with macroeconomic policy reforms followed since 1948, domestic agricultural policies were also adjusted. As stated in Henegedara (2002), the policies followed during the first regime (1948-1970) focused mainly on increasing rice production through expanding the area cultivated and improving productivity. According to Chandrapala (cited in Henegedara, 2002) programmes during the 1948-1970 period centred on five activities:

- i. increasing the extent of paddy land cultivated by the development of irrigation infrastructure and land settlement programmes,
- ii. increasing production and productivity through research and improved production technology,
- iii. developing institutions for farmers such as the establishment of cultivation committees and rural banks etc.,
- iv. changing land and land tenure policies and

- v. providing subsidies for production inputs and also credit facilities.

Henegedara (2002) further states that these policies continued during the 1970-1977 period with greater emphasis on farm support services such as credit, marketing and crop insurance. Thereafter, in keeping with the liberal economic policies of 1977, agricultural policy reforms were intended to achieve the following four objectives;

- i. Achievements of self sufficiency in basic foods - rice, milk, sugar, fish and pulses.
- ii. Expansion of exports to increase the contribution of agriculture to the balance of payments situation.
- iii. The creation of new employment opportunities and the consequent enhancement of incomes in the rural sector.
- iv. The improvement of the nutritional status of the people.

In addition, successive governments provided production subsidies to protect and encourage small producers and the two main input subsidies provided to farmers were the fertilizer subsidy and the irrigation subsidy. Meanwhile, the government confronted serious issues with the increasing expenditure on the fertilizer subsidy mainly in recent times due to its fiscal implications.

4.3 Evolution of Fertilizer Subsidy Policy in Sri Lanka

Chemical/inorganic fertilizers were introduced to Sri Lanka in 1950 before which only organic sources were used. The main objective of the fertilizer subsidy programme is to encourage farmers to adopt high yielding varieties with a view to attaining self-sufficiency in rice and also to ease the burden on the farmers' budget. On the other hand, the subsidy scheme was initiated to make fertilizer more affordable to encourage its wider use for increasing agriculture productivity.

The fertilizer subsidy in Sri Lanka was set in motion in 1962 at the onset of the Green Revolution which afterwards occupied a significant slot in government expenditure in the country. Three main types of fertilizers came to be used - urea to provide nitrogen (N), triple superphosphate (TSP) to provide phosphorus (P) and murate/muriate of potash (MOP) to provide potassium (K). Five major phases in the provision of the subsidy since its inception in 1962 until substituting it with the Fertilizer Cash Grant system in 2016 can be identified and are presented in detail below.

First Phase (1962 – 1989)

The programme envisaged that an increased paddy production would lower the prices of paddy and rice, thereby making rice affordable to the urban poor other than reducing the cost of production. At the inception of the programme in 1962, a fixed fertilizer

subsidy was introduced and different fertilizer types were subsidised at different rates. The subsidy was provided for all three main types of fertilizers: Urea for 'N', TSP for 'P' and MOP for 'K' primarily targeted paddy. Until 1975, the subsidy level varied according to the type of crop.

Since, this scheme was found to be unsuccessful as it allowed unauthorized leakages of fertilizer between agricultural sub sectors, in 1975, the government introduced a uniform subsidy scheme (at a rate of 33 percent) for all the crop sectors. However, subsidy rates varied according to the type of fertilizer and with the rates subjected to revision over time to 50 percent in 1978 and to 85 percent for urea and 75 percent for other fertilizers in 1979 necessitated by the highly volatile prices of fertilizer in the world market. Subsidy payments for sulphate of ammonia (SA) and rock phosphate (RP) ceased in 1988 and that left the price subsidies only for urea, TSP, MOP and the nitrogen phosphorus-potassium (NPK) mixture.

Further, the government established the Ceylon Fertilizer Corporation in 1964 to enter the fertilizer trade and importation by the private sector was banned in 1971 making it a monopoly of the Ceylon Fertilizer Corporation. Again, private sector companies were allowed to import fertilizer since 1977 following the trade liberalization policy and responsibility for administering the subsidy programme was vested in the National Fertilizer Secretariat in 1978.

Second Phase (1990 – 1994)

Soaring fertilizer prices in the international market on par with oil prices alongside the depreciation of exchange rate caused considerable difficulties in stabilising fertilizer prices during 1989. Hence, the fertilizer subsidy was completely withdrawn by the government with effect from January 1, 1990. The total use of fertilizer declined in 1990, in the wake of increase in fertilizer prices due to the removal of the subsidy. However, the decrease in consumption was not as low as it was anticipated. Further, with the removal of the subsidy, in order to cushion the adverse impact of sudden price increases of fertilizer, government revised upward the guaranteed price of paddy. Therefore, subsidies were not entertained for the period between 1990 and 1994.

Third Phase (1995 – 1996)

A full fertilizer subsidy was reintroduced in 1995 and continued until 1996. Urea, SA, MOP and TSP came under the subsidy, leading to fixed retail price levels. However, the subsidy for SA was withdrawn in 1996.

Fourth Phase (1997 – 2004)

In 1997, the government decided to restrict the fertilizer subsidy only to Urea. The objective of the new scheme was to provide a higher benefit to paddy farmers specially

the small-scale farmers while reducing the burden on the government budget. This scheme was also subjected to revision on a seasonal basis. During this period subsidy had been given in either of the following ways:

- a. Selling price of fertilizer is fixed allowing the subsidy component to vary depending on the import price.
- b. Subsidy component is fixed allowing the selling price of fertilizer to vary.

During the late 90s the selling price was fixed. Since the price was fixed with a variable subsidy component there was no incentive to the importers to import fertilizer when the world market prices were low. To address this issue the government decided to fix the subsidy component and allow the selling price to vary depending on the world market prices. When the international prices were very high it had an adverse impact on the farmers as the cost of production increased with the increase in fertilizer prices. This situation created financial difficulties particularly for small farmers in the dry zone where paddy cultivation largely exist. Therefore, again in 2004 the government decided to fix retail price of fertilizer. This system continued until December 2005.

Fifth Phase (2005 – 2015)

In December 2005, the government decided to reintroduce the subsidy scheme for all types of fertilizer in their straight form but not as mixtures by fixing their selling price and the scheme was restricted only for the paddy farmers cultivating five or less acres of paddy. Tea, rubber and coconut smallholder farmers (with less than five acres of land) became eligible for the fertilizer subsidy since 2006. In addition, other crops were also included in the programme in 2011; however, the subsidy rate for them was lower than that of paddy and resulted in higher retail prices for other crops than paddy.

In response to the facts that the financial burden, negative environmental externalities and concerns over food security the government of Sri Lanka slashed the fertilizer subsidy by 25 percent in its budget 2012-2013. The main objective of reducing the subsidy was to encourage farmers to use more organic fertilizers. However, paddy farmers complained to the government about that their inability to shift to organic fertilizer at such short notice and they foreshadowed a possible increase in the price of rice. The government revised its fertilizer subsidy policy by adjusting the fertilizer subsidy reduction only to 10 percent in 2013/2014 budget and continued the revision for the financial year 2014/2015.

Further, the fertilizer subsidy policy was coupled with a paddy procurement policy, which required farmers to supply a fixed portion of paddy to the government at a pre-specified price below the market price since 2009.

Sixth Phase (2016 Yala¹ Season – 2017/18 Maha Season)

The mounting burden of fertilizer subsidy compelled the government in the latter part of the 2015 to suggest a few modifications to the fertilizer subsidy policy. As a result, a Fertilizer Cash Grant was provided to farmers to buy fertilizer since 2016 *Yala* season. Priority was given to paddy, however, a selected list of other field crops was also supported by the programme.

Therefore, the fertilizer subsidy in Sri Lanka can be clearly categorized into three groups of policies:

- i. A full subsidy :- 1962 - 1989, 1995 - 1996, 2006 - 2015, 2016 - 2018
- ii. A urea-only subsidy :- 1997 - 2005
- iii. No subsidy :- 1990 - 1994

4.4 Phase Five and Phase Six of the Subsidy Programme

As mentioned earlier, the government converted the subsidy to a cash allowance in 2016. Therefore, the subsidy programme implemented from 2005 to 2015 was the precursor to the FCG programme. The implementation strategy of the programme from 2005 to 2015 and the FCG programme which is the main focus of this study are presented in detail below to provide a comprehensive view before discussing their impacts and challenges.

The Fertilizer Subsidy Programme: 2005-2015

This programme was implemented by the government since 2005/06 *Maha* season, and had attempted to achieve the national objectives of economic efficiency in fertilizer use in paddy cultivation, food security and welfare of rural farmers. The policy had following characteristics:

- i. indicative price of three main fertilizers: urea, TSP and MOP were issued at Rs.350 per 50 kg, and they had been provided as straight fertilizer,
- ii. procurement, distribution and issuing of fertilizers were made through state agencies,
- iii. fertilizers were issued on the basis of recommendations given by the Department of Agriculture and
- iv. fertilizer subsidy was targeted only on small scale paddy farmers who owned five acres/two hectares or less.

¹ *Maha* and *Yala* are synonymous with the two monsoonal periods in Sri Lanka. The *Maha* season occurs between the months of September to March and is dependent on rainfall from the north-east monsoon. The *Yala* season is effective during the period from May to August and is cultivated during the south-west monsoon. The particular season is defined by when the crop is sown and harvested.

Following conditions have also been introduced by the programme to the farmers to be eligible for the subsidy;

- i. Requirement of a reliable recommendation that they are currently using organic fertilizer for their cultivation.
- ii. Farmers should sell recommended levels of paddy (according to the government paddy purchasing programme) to the Paddy Marketing Board.
- iii. Farmers should be members of a farmer organisation and act according to the decisions made by the respective organisation. Recommendation for subsidy from the respective organisation should be obtained.

The relevant authorities of the programme should take the responsibility from the time of dispatching the fertilizer from port to final application, and the government has the full authority over provided fertilizer, and it is considered as a government asset until the time of final application by the farmer. All fertilizer recommendations were based on agro climatic zones (i. low-country dry and intermediate zone, ii. mid-country wet, up-country dry and high altitude low and up country zone, iii. up-country wet zone and iv. low-country wet zone) and irrigation schemes (major irrigation, minor irrigation and rain-fed) defined by the Department of Agriculture. Therefore, quantities were issued according to the land extent and respective fertilizer recommendation.

The fertilizer requirement of the country prior to a cultivation season had been identified through Agrarian Services Centres (ASC), and all the necessary distribution plans had been developed by the National Fertilizer Secretariat (NFS). ASCs collected relevant information related to paddy cultivation from the respective GN divisions. Ceylon Fertilizer Company Limited and Colombo Commercial Fertilizer Company imported the required amount according to the information supplied by the NFS. Later, fertilizer bags were distributed via ASCs and other selected focal points to avoid possible delays.

Under this scheme, the subsidy had been granted for both paddy and other crops. Paddy farmers had to pay Rs.350 per bag (50 kg) and it was compulsory for them to contribute for a crop insurance scheme by paying Rs.150 per 50 kg of fertilizer. It cost three rupees per kilo of fertilizer, totaling Rs.500 per 50 kg of fertilizer. At the same time, this was applicable to the other crops cultivated in the paddy lands as agreed at the *Kanna* meetings. For other crops, a straight fertilizer bag of 50 kg was issued at a price of Rs.1,200. Those farmers could purchase fertilizer at the open markets.

There were limitations in this programme and some of them had been discussed by print media and the following are some of the extracts.

'Farmers had complained that fertilizer issued only for 100 farmers from a centre within a day and it was not sufficient. At the same time, there were some centres without a single bag of fertilizer. Farmers also said that they had to spend nearly Rs.200 to get a bag of fertilizer for Rs.350. Therefore, there should be a platform to discuss these issues and the District Secretary, Grama Niladharis, Agriculture Instructors, ARPAs, representatives of Farmer Organisations should attend that'. ('Promises of Fertilizer Subsidy Programme' published in Lankadeepa Govibima Athirekaya, 2005.11.12)

'There were a lot of malpractices in distributing the subsidised fertilizer through Farmer Organisations in Dambulla and Matale areas. Discrimination by the office bearers of Farmer Organisations and not forwarding the filled application forms and cash of farmers at the right time to the right place had resulted in not receiving fertilizer on time by farmers'. ('The Truth of the Fertilizer Subsidy Programme' published in Lankadeepa Govibima Athirekaya, 2008.01.04)

'Frauds at the large scale were observed in the fertilizer subsidy programme and involvement of government officials also could be noted and it was prominent in the North Central province. At the same time, some officials attached to the Department of Agrarian Services and Farmer Organisations were remanded. Further, officials of the Department of Police have been able to raid a place where a 50kg bag of fertilizer worth Rs.350 was sold at Rs.1,000'. ('Corruption in Fertilizer Subsidy Programme: No Punishments to Culprits' published in Lankadeepa Govibima Athirekaya, 2008.02.11)

'The inorganic fertilizers distributed to farmers are imported to the country from countries such as Russia and Dubai. There were several malpractices in this supply chain and large scale fraud could be noted while importing and the support of some government officials was also evident. Fraud could be observed while transporting to main stores in Colombo, stores in local areas and storing at warehouses in village level. In addition, there were incidents of Farmer Organisations changing the data in the receipts issued to farmers'. ('Misuse of the Fertilizer Subsidy Programme' published in Sunday Divaina, 2010.08.01)

The Fertilizer Cash Grant (FCG) Programme: 2016 - 2018

The government first introduced this system in the budgetary speech for 2016, and this system was implemented since 2016 *Yala* to 2017/18 *Maha* seasons and this was to support the achievement of agricultural, economic and social development targets of

the country. Under the FCG programme, two categories can be identified as paddy and other field crops.

Fertilizer Cash Grant for Paddy

Under this scheme, farmers were entitled to a subsidy of Rs.25,000 per hectare per year subjected to a maximum of Rs. 50,000 per year. Accordingly, a farmer with one hectare received Rs.12,500 for *Yala* and Rs.12,500 for *Maha*, and a farmer with two hectares received Rs.25,000 for *Yala* and Rs.25,000 for *Maha*. The cash grant was purely based on the land extent; therefore, land extents ranging from >0.00 to ≤2.00 hectares were divided into 20 sections of 0.1 hectares, and accordingly, the cash grant ranged between Rs.1,250 and Rs.25,000 per season per farmer. At the same time, the same entitlement was applicable to other crops cultivated in paddy land as agreed at the *Kanna* meetings. Further, farmers who obtained the cash grant and not cultivated the previous season were not entitled for the grant of the current season. However, those who cultivated part of the applied land area received the cash grant proportionate to the extent cultivated. Fertilizer was available at the farmers' own residential areas through the sales agents of state and private sector fertilizer companies, Agrarian Service Centres and mobile sale vehicles. The maximum retail price of a 50 kg bag of straight fertilizer - urea, TSP and MOP - was Rs.2,500. Farmers were expected to buy the available fertilizer according to their requirement from the cash grant.

In the procedure of obtaining the grant, farmers had to get registered first at the GN division level within the Agrarian Service Centre area. For Mahaweli lands, it was at the Mahaweli Unit Manager's Office. The relevant application forms were issued by the Agriculture Research and Production Assistants (ARPAs) or Grama Niladharis (GNs) or Mahaweli Unit Managers (MUMs). Thereafter, the filled application with the recommendation of the relevant farmer organisation needs to be submitted to the above mentioned officers. Agriculture Research and Production Assistants, Grama Niladharis and Mahaweli Unit Managers were expected to be extremely cautious in issuing the cash grant on false information. The FCG can be recommended for any specific land only once per season, and it could be granted either to the (i) land owner, (ii) tenant farmer, (iii) lease farmer, (iv) cultivator or (v) cultivator on roster basis. Thereafter, ARPAs, GNs and MUMs had to recommend the applications, as well as to monitor the programme to ensure that the relevant farmer had commenced cultivation. Applications had to be collected on or before the deadline announced by the circular for that particular season.

At the same time, farmers who received the cash subsidy for tea, rubber, coconut and other field crop cultivations were entitled to cash subsidy for paddy cultivation as well.

Fertilizer Cash Grant for Other Field Crops

Only the farmers cultivating (i) potato, (ii) onion, (iii) chilli, (iv) soya bean and (v) maize were entitled to this cash subsidy. A farmer received a cash subsidy of Rs.10,000 per hectare per year. The cash grant was purely based on the land extent; therefore, extents ranging >0.00 to ≤1.00 hectares were divided into 10 sections of 0.1 hectares, and accordingly the cash grant ranged between Rs.1,000 and 10,000 per year per farmer. This grant was provided only once a year. Therefore, farmers cultivating in the *Yala* season or commencing cultivation in *Maha* or mid-season were eligible for this grant.

The procedure of getting the FCG for other field crops was similar to that applicable for paddy. Further, it was stated that the ARPAs should ensure that farmers receiving the cash subsidy, utilize the same for applying fertilizer to the same cultivation/s indicated. It was also indicated that Agriculture Instructors (AIs), DOs and Unit Managers in Mahaweli systems have to monitor the programme closely.

At the same time, farmers who received cash subsidy for tea, rubber, coconut and paddy cultivations were entitled for cash subsidy for other field crop cultivations as well.

Most importantly, it was mentioned in the guidelines that both programmes need to be supervised to prevent any discrimination against any farmer on personal grounds and to ensure transparency in every possible circumstance at all stages.

Four state banks, namely, People's Bank, Bank of Ceylon, National Savings Bank and Regional Development Bank served as the banking partners of the FCG programme. In addition, arrangements had been made with the banks to open '*Govindiriya*' accounts without basic deposits and instructions had been given not to deduct farmers' loans from those accounts.

Print media evidence on limitations of the FCG programme is presented below.

'Most of the farmers who applied for the grant in previous Yala season have not received it yet. Therefore, there is no need to talk on this Maha season. Some farmers have received the grant, however, the amount received was less compared to the previous season, though they have cultivated the same land extent'. ('Who Misuses the Fertilizer Cash Grant' published in Divaina Sarubima Athirekaya, 2017.01.13)

4.5 Fertilizer Recommendations of the Department of Agriculture

As mentioned before, chemical/inorganic fertilizers were introduced to Sri Lanka in 1950 and the fertilizer mixtures had been used till 1990. In 1990, the Department of

Agriculture (DOA) had recommended straight fertilizers with organic manure. Thereafter, DOA had introduced Soil Test Based Fertilizer Recommendations in 1993. In 2001, fertilizer recommendation based on target yield was introduced for rice and Zinc (Zn) recommendation had been also introduced. Recommendations for horticultural crops were introduced by the DOA in 2007 and it was revised in 2010. In 2013, recommendations based on efficient use of fertilizers were introduced for rice (Table 4.1) and at that time, granular urea was introduced instead of piled urea. Further, they have initiated Special Fertilizer Testing Programmes in 2013. In 2016, fertilizer recommendation for rice based on ASC region was initiated and in 2017, fertilizer recommendation for rice based on GN segments was initiated.

Table 4.1: Fertilizer Recommendations for Paddy Cultivation -2013

Agro-climatic Zone	Irrigation Scheme	Fertilizer Quantity (kg/ha)			
		Urea	TSP	MOP	Total
Low-country dry and intermediate zone <i>and</i> Mid-country wet, up-country dry and high altitude low and up country zone	Major	225	55	60	340
	Minor	225	55	60	340
	Rain-fed	175	35	50	260
Up-country wet zone <i>and</i> Low-country wet zone	Major	140	35	50	225
	Minor	140	35	50	225
	Rain-fed	100	55	110	265

Source: Department of Agriculture

4.6 Organic Fertilizer as a Substitute

Use of organic manure in agriculture is an effective way to improve soil health. Soil health relies on the balance of macro nutrients and micro nutrients as well as microbial health. Improvement and maintaining soil properties such as physical, chemical and biological properties of soil are vital operations for any farming system to sustain productivity. There are different types of organic manures such as animal manure, green manure, crop residues, composts and liquid extracts. However, different manures consist of different types of plant nutrients in different quantities. Table 4.2 presents the availability of nutrients in different animal manure. Mainly organic manures contribute more to the soil than merely adding nitrogen, phosphorus and potassium.

Further, continuous use of manures builds organic matter in soils while improving soil structure. This modification of soil structure helps improve water holding capacity, aeration, friability and drainage. In addition, many trace nutrients needed for optimum plant growth are available in manures. Plant nutrients are also released more slowly and over a longer period than from most commercial inorganic fertilizers. Organic manure is used completely to obtain almost all nutrient supplements in organic farming systems.

However, in Integrated Plant Nutrient Management Systems (IPNMS), organic manure is used as a soil amendment other than obtaining plant nutrients in relation to sustainability. By forming of chelates, uptake of toxic trace metals into plants is restricted when soils contain organic manure. There is an increased demand for organic fertilizer in the country due to the awareness of the value of chemical free food products.

Table 4.2: Nutrients in Animal Manures

Type	N	P ₂ O ₅	K ₂ O	Ca	Mg	S	Fe	Cu	Mn	Zn
	kg/t (Dry Weight Basis)						g/t (Dry Weight Basis)			
Buffalo	14.4	13.0	8.0	9.4	6.5	5.7	2.8	35.9	233	206
Cattle	17.4	16.8	9.2	7.9	6.0	5.0	3.5	30.9	237	218
Goat	24.7	16.0	9.3	26.5	10.2	6.8	3.3	37.9	662	172
Sheep	18.5	15.2	6.0	21.3	12.2	6.5	2.0	32.4	748	220
Pig	20.0	33.3	9.4	11.1	9.6	7.1	5.6	28.5	288	164
Poultry	29.5	34.6	22.5	51.5	7.0	7.1	4.3	96.5	331	270

Source: Department of Agriculture

4.7 New Trends in Application of Fertilizer

New fertilizers used in Sri Lanka are NPK formulations with trace elements, micronutrient mixtures, and fertilizer mixtures for hydroponics, fertigation mixtures and fertilizer with growth promoting substances and micronutrient containing fertilizers and liquid fertilizers. Most of these fertilizers are comparatively high value fertilizers imported in small quantities. They are either organic fertilizers or inorganic fertilizers and over hundreds types of new fertilizers are available in the market today.

Although the DOA has not recommended liquid fertilizers or any other special fertilizers, a few farmers use them on crops such as vegetables, onion, potatoes, fruits and floricultural crops. However, despite the fact that most of those are not essential, farmers are lured to use them by fertilizer companies. Before 2013, there was no proper method for importing those new fertilizers to the country. However, in 2013, the DOA commenced a programme to test new fertilizer products flowing into the country which do not undergo suitable assessments in their performances and quality as well. According to the protocol of testing new fertilizers, the suppliers should submit a duly filled application to the fertilizer testing committee with reports from an accredited laboratory for the contents of the products (nutrients, heavy metals and other hazardous materials). If fertilizer testing committee selects the product for testing, the product should be tested under greenhouse condition first. According to performances in greenhouse testing, product should be tested under field condition and a significant

yield increase (20%) over DOA recommended fertilizer is expected from the new fertilizer product. All new products are tested at different research stations of the DOA covering diverse agro-ecological conditions.

CHAPTER FIVE

Socio-economic Profile of the Sample

5.1 Introduction

Demographic profile of farmers, socio-economic status of farm families and nature of farming are discussed in detail in this chapter to provide an understanding about the study sample. In presenting the findings, paddy farmers were categorized into three groups based on the irrigation scheme, major, minor and rain-fed, and the results are analyzed separately. In addition, the details of Other Field Crop (OFC) farmers are also analyzed separately.

5.2 Demographic Profile of the Farmers

Of the paddy farmers who received the Fertilizer Cash Grant in 2016/17 *Maha* season, all the farmers under major irrigation schemes and all the farmers in Polonnaruwa have pursued paddy cultivation by themselves. Two farmers in Kurunegala and one in Matara, who were the land owners, have received the grant. However, cultivation was undertaken by tenant farmers in Kurunegala and by a leased farmer in Matara. Therefore, the details of those tenant farmers and leased farmer are also included in the analysis. All the OFC farmers in the sample have practised cultivation by themselves.

Age Distribution

Of the paddy farmers the highest number (32%) belonged to the category of 50-59 years followed by 40-49 years (24%) and 60-69 years (19%). Therefore the majority (75%) concentrated in the age group of 40-70 years (Table 5.1 and Figure 5.1). Compared to other districts, more young farmers (age group 20-39) were noted in Kilinochchi (29%) and Polonnaruwa (24%) while more older group of farmers (age group 70-89 years) were noted in Matara (17%).

Of the OFC farmers the highest number (33%) belonged to the age category of 60-69 years followed by the age category 50-59 years (28%) and 40-49 years (23%). Therefore, similar to paddy farmers, the majority of OFC farmers (84%) belonged to the age group 40-70 years (Table 5.2 and Figure 5.1). Compared to other districts young farmer participation was high among chilli (20%) and maize (20%) farmers (Table 5.2).

Table 5.1: Age of the Paddy Farmers in the Sample

Age Category (Years)	Major			Minor		Rain-fed	Total (N=273) %
	Anu* (N=45) %	Amp* (N=45) %	Kil* (N=45) %	Kur* (N=47) %	Pol* (N=45) %	Mat* (N=46) %	
20-29	-	-	7	2	2	4	3
30-39	16	13	22	9	22	6	15
40-49	18	20	27	19	33	28	24
50-59	29	47	33	26	27	33	32
60-69	31	18	9	34	13	11	19
70-79	4	2	2	9	2	15	6
80-89	2	-	-	2	-	2	1

Note: Anu* - Anuradhapura, Amp* - Ampara, Kil* - Kilinochchi, Kur* - Kurunegala, Pol* - Polonnaruwa, Mat* - Matara

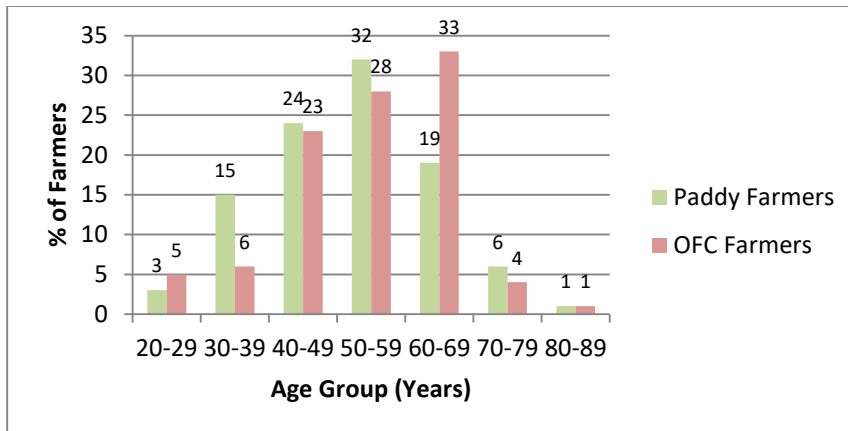
Two tenant farmers in Kurunegala and one leased farmer in Matara who got the land from the owner to cultivate are also included.

Source: Field Survey, 2017

Table 5.2: Age of the OFC Farmers in the Sample

Age Category (Years)	OFC Farmers				
	Potato (N=30) %	Onion (N=30) %	Chilli (N=30) %	Maize (N=30) %	Total (N=120) %
20-29	3	-	10	7	5
30-39	-	-	10	13	6
40-49	20	23	27	20	23
50-59	33	27	20	33	28
60-69	33	43	30	27	33
70-79	10	7	-	-	4
80-89	-	-	3	-	1

Source: Field Survey, 2017

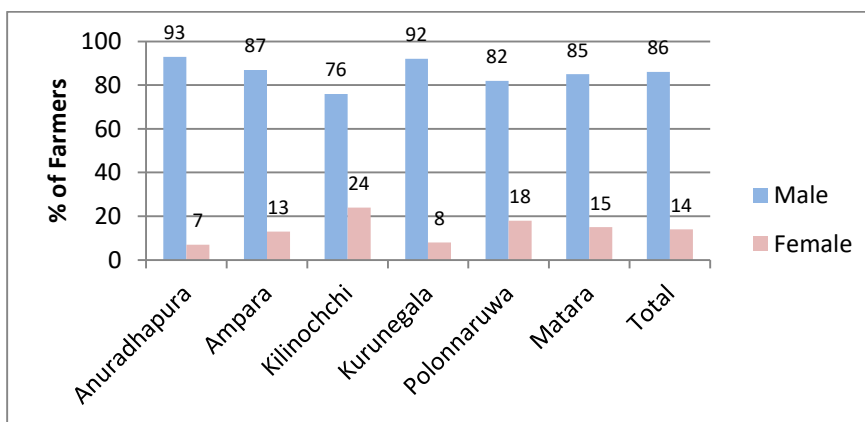


Source: Field Survey, 2017

Figure 5.1: Age of the Farmers in the Sample

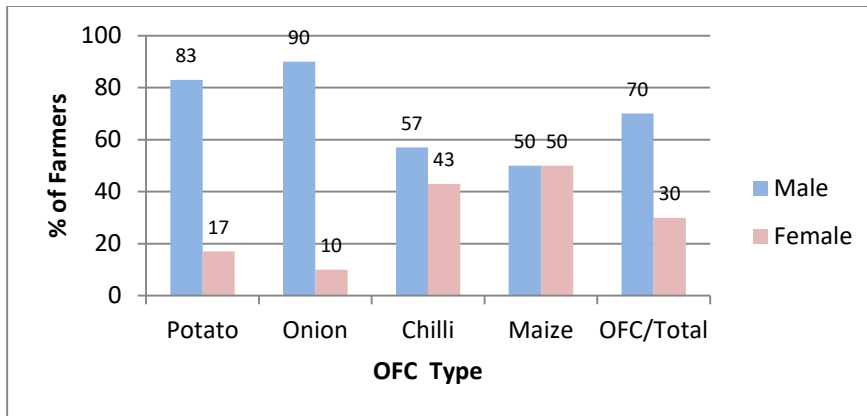
Sex and Marital Status

According to Figure 5.2, of the paddy farmers the majority (86%) were men in all six districts. However, compared to other districts, women participation was high in Kilinochchi (24%) and Polonnaruwa (18%). Similarly, the majority (70%) of OFC farmers were also men and it was prominent among potato and onion farmers (Figure 5.3). However, of the chilli farmers only 57 percent were men and of the maize farmers it was only 50 percent and therefore more women farmers were noted among chilli (43%) and maize (50%) farmers. The majority among paddy farmers (96%) and OFC farmers (88%) were married (Figure 5.4).



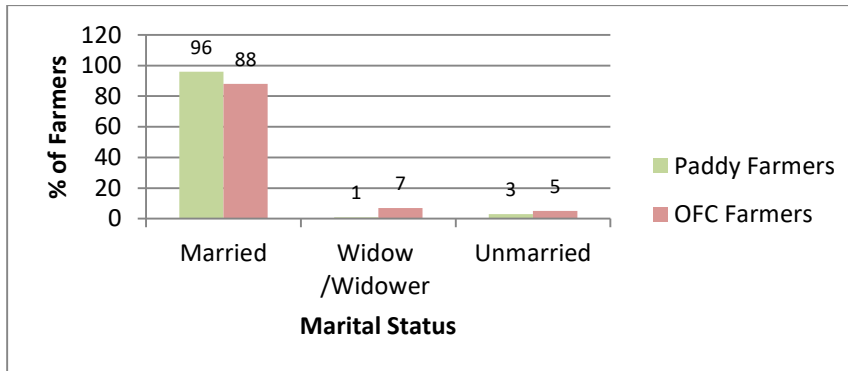
Source: Field Survey, 2017

Figure 5.2: Sex Distribution – Paddy Farmers in the Sample



Source: Field Survey, 2017

Figure 5.3: Sex Distribution – OFC Farmers in the Sample



Source: Field Survey, 2017

Figure 5.4: Marital Status of Farmers in the Sample

Educational Attainment

The highest number of farmers (28%) had studied up to grade six to ten followed by those studied up to Ordinary Level (24%) and grade one to five (22%). However, the highest number in Ampara (31%) had studied only up to grade one to five and in Polonnaruwa (31%) and Matara (18%) the highest number had sat the Ordinary Level (Table 5.3 and Figure 5.5). Similarly, according to Table 5.4 and Figure 5.5, of the OFC farmers, the highest number (38%) had studied up to grade six to ten followed by those sat the Ordinary Level (18%) and grade one to five (18%).

Table 5.3: Educational Attainment of the Paddy Farmers in the Sample

Educational Attainment	Major			Minor		Rain-fed	Total (N=273) %
	Anu* (N=45) %	Amp* (N=45) %	Kil* (N=45) %	Kur* (N=47) %	Pol* (N=45) %	Mat* (N=46) %	
No schooling	-	4	4	-	2	1	2
Grade 1 - 5	18	31	13	30	18	10	22
Grade 6 -10	38	11	40	34	29	8	28
Sat O/L	18	27	7	23	31	18	24
Passed O/L	9	7	9	9	9	2	8
Sat A/L	13	13	13	2	4	4	9
Passed A/L	4	7	7	2	2	2	4
Diploma/ Vocational Training	-	-	4	-	4	1	2
Graduate	-	-	2	-	-	-	<1

Note: Anu*- Anuradhapura, Amp* - Ampara, Kil* - Kilinochchi, Kur* - Kurunegala, Pol* - Polonnaruwa, Mat* - Matara

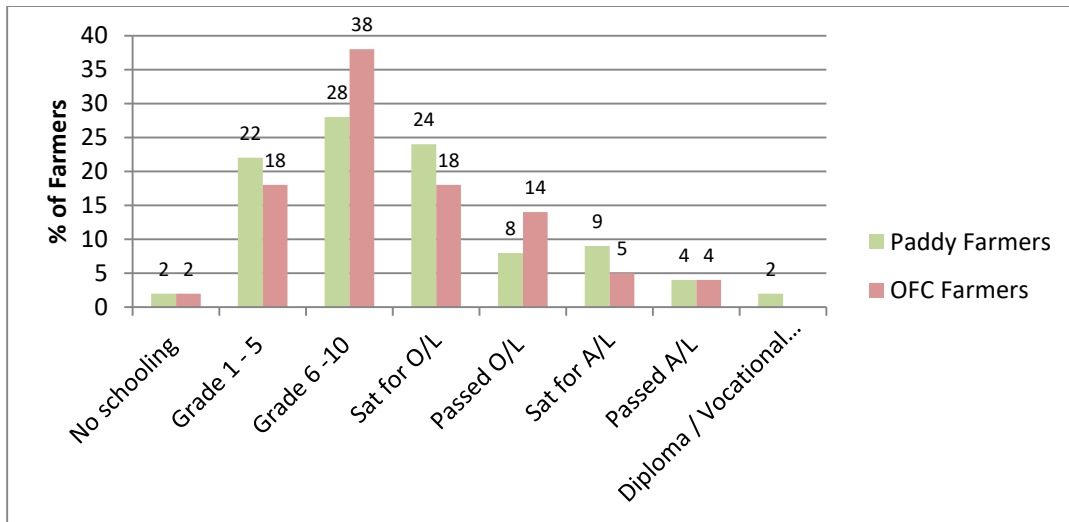
Two tenant farmers in Kurunegala and one leased farmer in Matara who got the land from the owner to cultivate are also included.

Source: Field Survey, 2017

Table 5.4: Educational Attainment of the OFC Farmers in the Sample

Educational Attainment	OFC Farmers				
	Potato (N=30) %	Onion (N=30) %	Chilli (N=30) %	Maize (N=30) %	Total (N=120) %
No schooling	-	-	-	7	2
Grade 1 - 5	10	13	27	23	18
Grade 6 -10	43	37	43	30	38
Sat O/L	7	20	17	30	18
Passed O/L	27	20	3	7	14
Sat A/L	3	7	10	-	5
Passed A/L	10	3	-	3	4

Source: Field Survey, 2017



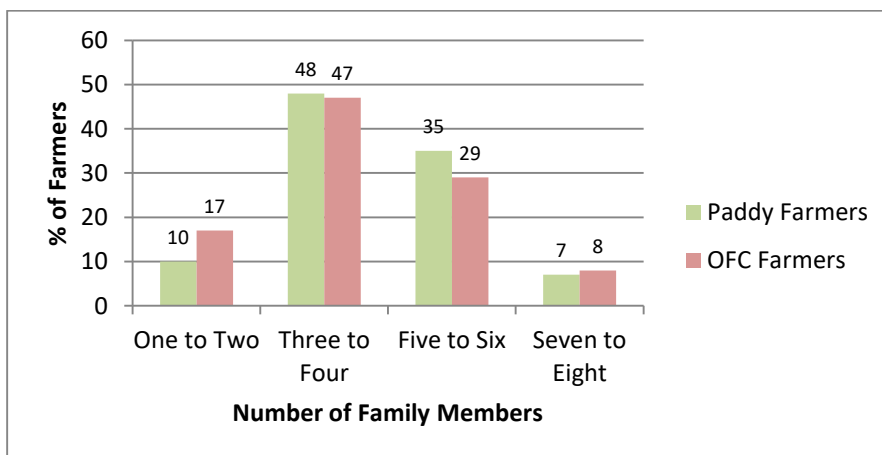
Source: Field Survey, 2017

Figure 5.5: Educational Attainment of Farmers in the Sample

5.3 Socio-economic Status of Farm Families

Size of the Family

It was observed that nearly half of paddy (48%) and OFC (47%) farmers had three to four members in their families (Figure 5.6). It was noted in all the study locations except in paddy farmers in Kurunegala. In Kurunegala, the highest number of farmers (43%) had five to six members in their families.

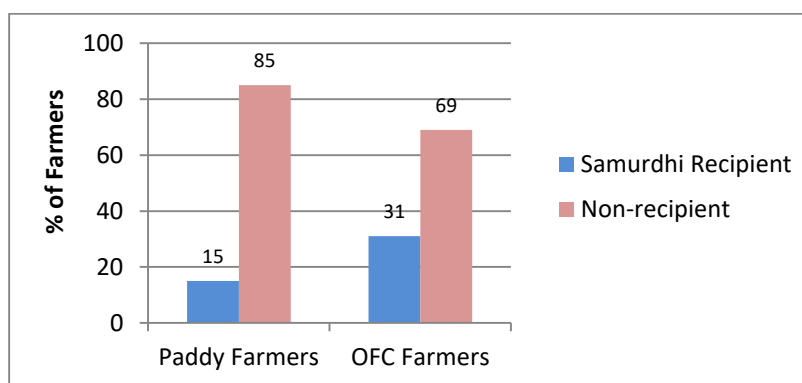


Source: Field Survey, 2017

Figure 5.6: Number of Members in Farm Families in the Sample

Presence of Samurdhi Recipient Families

The majority of paddy (85%) and OFC (69%) farmers were from the families not benefitted by the *Samurdhi* programme (monthly allowance granted by the state to poor families) and therefore, they cannot be considered as poor families. (Figure 5.7). At the same time, it was also noted that more *Samurdhi* recipient families were from the OFC group (31%) compared with the paddy farmers (15%). Of the paddy farmers the least number of *Samurdhi* recipient families were from Ampara (4%) and the highest number was from Kurunegala (28%). Of the OFC farmers the least and the highest number of *Samurdhi* recipient families were among potato (20%) and chilli (40%) farmers respectively.



Source: Field Survey, 2017

Figure 5.7: *Samurdhi* Recipients and Non-recipients in the Sample

Income Sources

Table 5.5 shows that the majority of paddy farmers in Anuradhapura (91%), Ampara (72%), Kurunegala (79%) and Polonnaruwa (76%) were having more than one income source in their families indicating that they are more resilient to economic shocks than the majority of farmers in Kilinochchi and Matara. Further, most of the income sources (67%) were agriculture related activities (Table 5.6).

Table 5.5: Number of Income Sources of Families of the Paddy Farmers in the Sample

Number of Income Sources	Major			Minor		Rain-fed	Total (N=273) %
	Anu* (N=45) %	Amp* (N=45) %	Kil* (N=45) %	Kur* (N=47) %	Pol* (N=45) %	Mat* (N=46) %	
One	9	28	47	21	24	50	30
Two	42	52	40	43	58	30	44
Three	38	13	13	26	18	13	20
Four	9	7	-	4	-	7	4
Five	2	-	-	6	-	-	1

Note: Anu* - Anuradhapura, Amp* - Ampara, Kil* - Kilinochchi, Kur* - Kurunegala, Pol* - Polonnaruwa, Mat* - Matara

Two tenant farmers in Kurunegala and one tenant farmer in Matara who got the land from the owner to cultivate are also included.

Source: Field Survey, 2017

Table 5.6: Nature of Income Sources of Families of the Paddy Farmers in the Sample

Nature of Income Sources	Major			Minor		Rain-fed	Total (N=556) %
	Anu* (N=114) %	Amp* (N=89) %	Kil* (N=75) %	Kur* (N=88) %	Pol* (N=109) %	Mat* (N=81) %	
Agriculture related	74	73	80	47	65	70	67
Non-agriculture related	26	27	20	53	35	30	33

Note: Anu* - Anuradhapura, Amp* - Ampara, Kil* - Kilinochchi, Kur* - Kurunegala, Pol* - Polonnaruwa, Mat* - Matara

Two tenant farmers in Kurunegala and one tenant farmer in Matara who got the land from the owner to cultivate are also included.

Source: Field Survey, 2017

With reference to OFC, the majority of all the OFC farmers (78%) were having more than one income source in their families prominently among potato (97%) and maize (87%) farmers (Table 5.7). Of the economic activities, the majority (74%) were agriculture related (Table 5.8).

Table 5.7: Number of Income Sources of Families of the OFC Farmers in the Sample

Number of Income Sources	OFC Farmers				
	Potato (N=30) %	Onion (N=30) %	Chilli (N=30) %	Maize (N=30) %	Total (N=120) %
One	3	37	33	13	22
Two	37	27	57	37	39
Three	43	23	3	43	28
Four	10	13	7	3	8
Five	7	-	-	3	3

Source: Field Survey, 2017

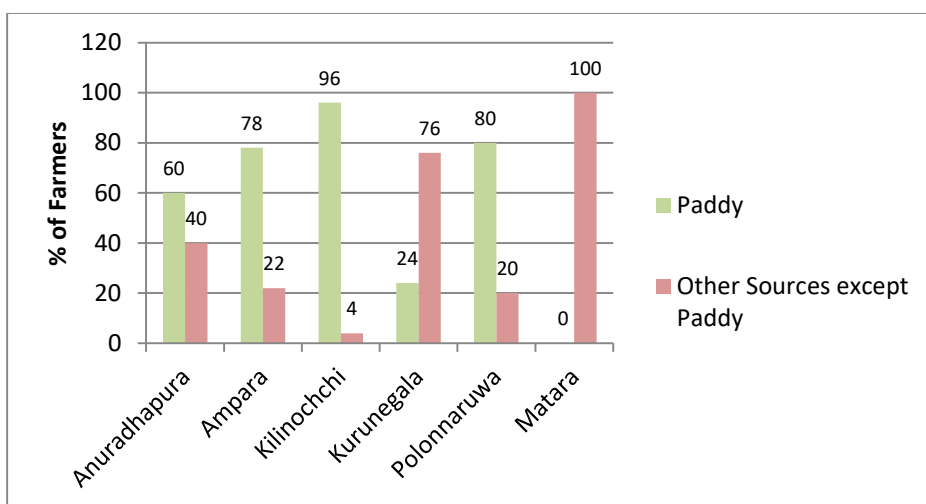
Table 5.8: Nature of Income Sources of Families of the OFC Farmers in the Sample

Nature of Income Sources	OFC Farmers				
	Potato (N=84) %	Onion (N=64) %	Chilli (N=55) %	Maize (N=74) %	Total (N=277) %
Agriculture related	71	84	78	65	74
Non-agriculture related	29	16	22	35	26

Source: Field Survey, 2017

Main Income Source

Figure 5.8 shows that of the paddy farmers under major irrigation schemes the main income source of the majority was paddy (60% in Anuradhapura, 78% in Ampara and 96% in Kilinochchi). However, under minor irrigation, majority of the farmers only in Polonnaruwa (80%) had paddy farming as the main income source. In Kurunegala, paddy farming was the main income source only for nearly one fourth (24%) of the sample (Figure 5.8). Table 5.9 shows that the other main income sources noted in Kurunegala as unskilled non-agricultural labour (22%), skilled jobs (15%) and OFC/vegetables/coconut cultivation (11%). It was interesting to note that none of the farmers in Matara perceived paddy farming as their main income source (Figure 5.8). The main income source of 74% of farmers in Matara was tea plantations (Table 5.9).



Source: Field Survey, 2017

Figure 5.8: Main Income Source of Paddy Farmers in the Sample

Table 5.9: Main Income Source of Families of the Paddy Farmers in the Sample

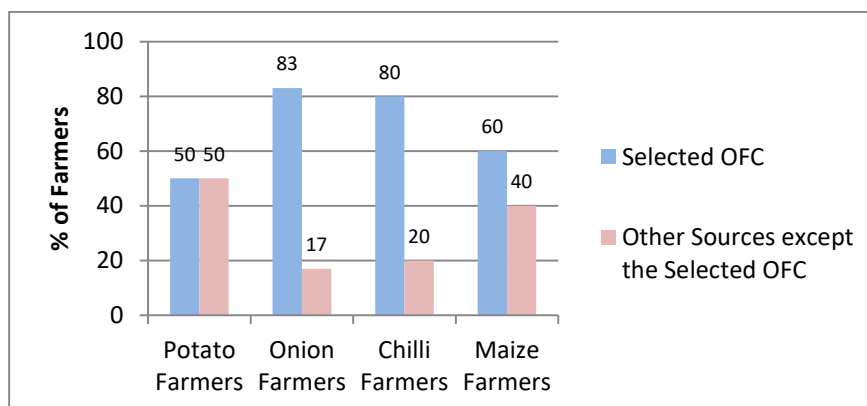
Main Income Source	Major			Minor		Rain-fed	Total (N=273) %
	Anu* (N=45) %	Amp* (N=45) %	Kil* (N=45) %	Kur* (N=47) %	Pol* (N=45) %	Mat* (N=46) %	
Paddy farming	60	78	96	24	80	-	56
Tea cultivation						74	12
Unskilled non-agricultural labour	9	-	2	22	4	2	7
OFC/vegetables/coconut cultivation	13	2	2	11	2	-	5
Skilled job	2	4	-	15	4	2	5
Armed forces	4	7	-	4	2	4	4
Self employment	2	4	-	7	4	9	4
Government employee	4	4	-	4	-	4	3
Foreign remittance /Samurdhi allowance	2	-	-	7	-	2	2
Retired government servant	2	-	-	2	2	-	1
Private sector employee	-	-	-	2	-	2	1
Unskilled agricultural labour	-	-	-	2	-	-	<1

Note: Anu* - Anuradhapura, Amp* - Ampara, Kil* - Kilinochchi, Kur* - Kurunegala, Pol* - Polonnaruwa, Mat* - Matara

Two tenant farmers in Kurunegala and one leased farmer in Matara who got the land from the owner to cultivate are also included.

Source: Field Survey, 2017

Of the OFC farmers, the main income source of 83 percent of onion farmers, 80 percent of chilli farmers and 60 percent of maize farmers was the selected OFC (Figure 5.9). However, according to Table 5.10 potato was the main income source for only 50 percent of potato farmers and the other main income sources were employments in the state service (23%) and armed forces (10%). It was also noted that compared to others, onion and chilli farmers had limited income sources other than the OFC cultivation (Table 5.10).



Source: Field Survey, 2017

Figure 5.9: Main Income Source of OFC Farmers in the Sample

Table 5.10: Main Income Source of Families of the OFC Farmers in the Sample

Main Income Source	OFC Farmers				
	Potato (N=30) %	Onion (N=30) %	Chilli (N=30) %	Maize (N=30) %	Total (N=120) %
Potato cultivation	50	-	-	-	13
Onion cultivation	-	83	-	-	21
Chilli cultivation	-	-	80	-	20
Maize cultivation	-	-	-	60	15
Paddy cultivation	-	13	10	-	6
Retired government employee	10	3	-	7	5
Government employee	13	-	-	3	4
Armed forces	10	-	-	3	3
Private sector employee	3	-	-	7	3
Vegetable/fruits/legume cultivation	7	-	-	3	3
Samurdhi allowance	-	-	7	3	3
Self employment	3	-	-	3	2
Unskilled non-agricultural labour	-	-	3	3	2
Skilled job	-	-	-	7	2
Unskilled agricultural labour	3	-	-	-	1

Source: Field Survey, 2017

Annual Family Income

The highest number of paddy farmers in all the six locations belonged to families with an annual income above Rs. 500,000 (Table 5.11). Compared to other locations, more farmers in Polonnaruwa (56%) and Anuradhapura (42%) were in that category and the lowest was observed in Matara (22%) and Kurunegala (26%).

Table 5.11: Annual Income of Families of the Paddy Farmers in the Sample

Annual Income (Rs.)	Major			Minor		Rain-fed	Total (N=273) %
	Anu* (N=45) %	Amp* (N=45) %	Kil* (N=45) %	Kur* (N=47) %	Pol* (N=45) %	Mat* (N=46) %	
≤50,000	-	2	-	4	-	7	2
50,001-100,000	2	-	4	6	4	9	4
100,001-150,000	2	2	4	9	7	17	7
150,001-200,000	2	9	7	11	2	4	6
200,001-250,000	13	4	7	13	7	11	9
250,001-300,000	13	9	7	15	7	4	9
300,001-350,000	11	13	2	4	9	-	7
350,001-400,000	7	9	11	9	2	9	8
400,001-450,000	4	7	9	4	7	11	7
450,001-500,000	4	7	11	-	-	7	5
>500,000	42	38	38	26	56	22	36

Note: Anu* - Anuradhapura, Amp* - Ampara, Kil* - Kilinochchi, Kur* - Kurunegala, Pol* - Polonnaruwa, Mat* - Matara

Two tenant farmers in Kurunegala and one leased farmer in Matara who got the land from the owner to cultivate are also included.

Source: Field Survey, 2017

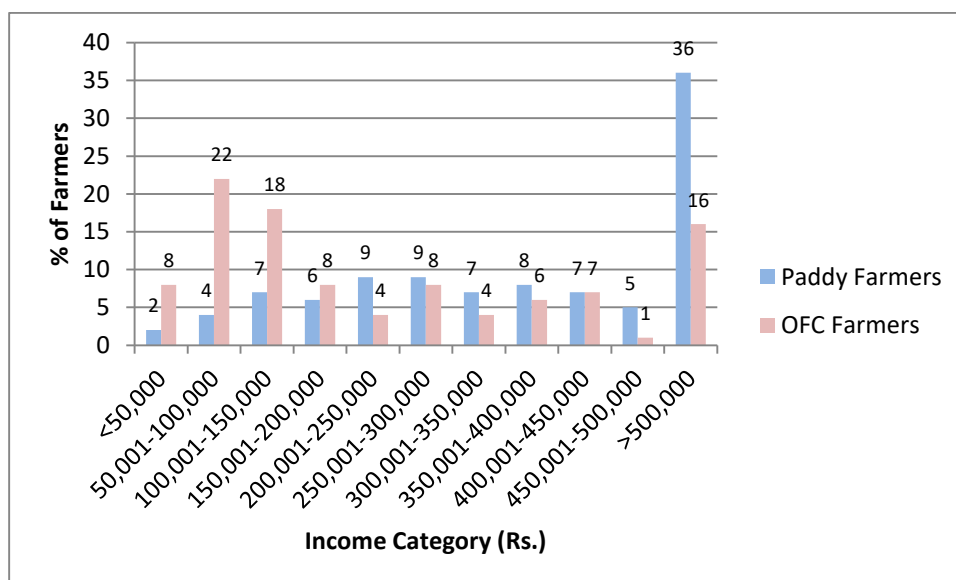
Of the OFC farmers, the highest number of farmers (30%) among potato and maize also belong to a family having an annual income of more than Rs. 500,000 (Table 5.12). However, the highest number of onion (30%) and chilli (47%) farmers belonged to families having an annual income between Rs. 50,001 – 100,000 (Table 5.12).

Table 5.12: Annual Income of Families of the OFC Farmers in the Sample

Annual Income (Rs.)	OFC Farmers				
	Potato (N=30) %	Onion (N=30) %	Chilli (N=30) %	Maize (N=30) %	Total (N=120) %
≤50,000	3	20	10	-	8
50,001-100,000	10	30	47	-	22
100,001-150,000	3	27	27	13	18
150,001-200,000	10	13	-	7	8
200,001-250,000	-	3	7	7	4
250,001-300,000	10	3	7	10	8
300,001-350,000	10	-	-	7	4
350,001-400,000	13	-	-	10	6
400,001-450,000	7	3	-	17	7
450,001-500,000	3	-	-	-	1
>500,000	30	-	3	30	16

Source: Field Survey, 2017

Therefore, compared to the OFC farmers, the paddy farmers were accruing a higher annual income and specially more onion and chilli farmers were from comparatively economically poor families (Figure 5.10).



Source: Field Survey, 2017

Figure 5.10: Annual Income of Farmers in the Sample

5.4 Nature of the Farmer and Farming Activities

In explaining the nature of the farmer the following indicators were used and the results are presented separately. The indicators were type of farmer, ownership of cultivable lands, participation in farmer organisations and the way of utilizing the harvest.

Type of the Farmer

Table 5.13 presents that the majority of paddy farmers (89%) had their own paddy lands (98% both in Ampara and Polonnaruwa, 93% in Kilinochchi, 91% in Anuradhapura, 89% in Kurunegala and 63% in Matara). Tenant farmers were noted in all six districts and their presence was prominent in Kilinochchi (36%), Kurunegala (28%) and Matara (28%) compared to other locations and Ampara recorded only two percent. More leased farmers were observed in Kilinochchi (38%) and of them, 14 had owned lands as well, and two had owned land and tenant paddy fields as well. Encroached paddy lands were noted in Polonnaruwa. However, it was only four percent in the sample (Table 5.13). Cultivators on roster basis were present only in Matara and it was comparatively a significant number (26%). Further, 18 percent of farmers in Matara had only tenant paddy lands.

Table 5.13: Type of Paddy Farmers in the Sample

Type	Major			Minor		Rain-fed	Total (N=273) %
	Anu* (N=45) %	Amp* (N=45) %	Kil* (N=45) %	Kur* (N=47) %	Pol* (N=45) %	Mat* (N=46) %	
Land owner	91	98	93	89	98	63	89
Tenant farmer	13	2	36	28	22	28	22
Leased farmer	2	-	38	-	4	4	8
Encroached lands	-	-	-	-	4	-	1
Cultivator on roster basis	-	-	-	-	-	26	4

Note: Anu* - Anuradhapura, Amp* - Ampara, Kil* - Kilinochchi, Kur* - Kurunegala, Pol* - Polonnaruwa, Mat* - Matara

Two tenant farmers in Kurunegala and one leased farmer in Matara who got the land from the owner to cultivate are also included.

Multiple Responses

Source: Field Survey, 2017

Similarly, the majority of OFC farmers (88%) also had their own lands; all the potato and maize farmers, 80 percent of onion and 73 percent of chilli farmers (Table 5.14). Tenant farming was observed only among onion (37%) and chilli (10%) farmers. OFC farming on leased lands were observed among all and it was prominent among onion (43%) and chilli (30%) farmers. In Moneragala, 37 percent of maize farmers had encroached lands

other than their own lands. In addition, one potato farmer was cultivating potato on a mortgaged land.

Table 5.14: Type of OFC Farmers in the Sample

Number of Income Sources	OFC Farmers				
	Potato (N=30) %	Onion (N=30) %	Chilli (N=30) %	Maize (N=30) %	Total (N=120) %
Land owner	100	80	73	100	88
Tenant farmer	-	37	10	-	12
Lease farmer	13	43	30	3	23
Encroached lands	-	-	-	37	9
Pawned land	3	-	-	-	1

Multiple responses

Source: Field Survey, 2017

Ownership of Cultivable Lands

Table 5.15 shows that the majority of paddy farmers who owned paddy fields under major irrigation schemes had paddy lands larger than two acres in extent; 76 percent in Anuradhapura and 95 percent in Ampara having more than two to three acres while 76 percent of farmers in Kilinochchi having paddy land beyond four acres. Similarly, the majority of farmers in Polonnaruwa (80%) had paddy lands of over two acres. In contrast, the majority in Matara (88%) and Kurunegala (72%) owned two acres or less (Table 5.15).

Table 5.15: Paddy Land Extent Owned by Farmers in the Sample

Land Extent (ac)	Major			Minor		Rain-fed	Total (N=254) %
	Anu* (N=41) %	Amp* (N=44) %	Kil* (N=42) %	Kur* (N=42) %	Pol* (N=44) %	Mat* (N=41) %	
≤1.0	2	-	2	43	2	56	17
>1.0 – 2.0	10	-	7	29	18	32	16
>2.0 – 3.0	76	95	10	19	23	12	39
>3.0 – 4.0	-	-	5	7	14	-	4
>4.0 – 5.0	7	5	50	-	20	-	14
>5.0	5	-	26	2	23	-	9

Note: Anu* - Anuradhapura, Amp* - Ampara, Kil* - Kilinochchi, Kur* - Kurunegala, Pol* - Polonnaruwa, Mat* - Matara

Two tenant farmers in Kurunegala and one leased farmer in Matara who got the land from the owner to cultivate are also included.

Source: Field Survey, 2017

All the farmers in both potato and chilli samples had their own cultivating highlands and lowlands and ownership extents for both highlands and lowlands cultivating potato were more or less equal compared to chilli (Table 5.16). In most cases low lands had been used for paddy cultivation in *Maha* and OFC in *Yala* seasons. Of the potato farmers, 43 and 50 percent of farmers owned extents ranging from half to one acre for highlands and lowlands respectively. Of the chilli farmers, 45 percent owned half an acre to one acre of land for highlands followed by less than half an acre (41%). Onion farmers had ownership for only highlands and 58 percent had half an acre to one acre followed by less than half an acre (21%). However, four onion farmers had cultivated onion on low lands on tenant/lease basis. Maize had been cultivated only on highlands and the highest number of farmers (37%) owned over two to 2.5 acres followed by more than 1.5 to two acres (23%) and 13 percent had more than 2.5 to three acres.

Table 5.16: OFC Land Extent Owned by Farmers in the Sample

Land Extent (ac)	OFC Farmers							
	Potato (N=30) %		Onion (N=24) %		Chilli (N=22) %		Maize (N=30) %	
	H*	L*	H*	L*	H*	L*	H*	L*
<0.5	37	17	21	-	41	-	-	-
0.5 - 1.0	43	50	58	-	45	9	3	-
>1.0 – 1.5	7	3	8	-	9	-	3	-
>1.5 – 2.0	7	7	4	-	-	5	23	-
>2.0 – 2.5	-	-	4	-	-	-	37	-
>2.5 – 3.0	-	-	-	-	5	5	13	-
>3.0 – 3.5	3	-	-	-	-	-	3	-
>3.5 – 4.0	-	-	-	-	-	-	7	-
>4.0	-	-	4	-	-	-	10	-

Note: H* – Highland, L* – Lowland

Source: Field Survey, 2017

Participation in Farmer Organisations

It was compulsory for farmers to be in a farmer organisation to be eligible for the fertilizer subsidy. Of the paddy farmers surveyed the majority (89%) were only members of their respective farmer organisations (Table 5.17). Further, more farmers in Ampara and Kilinochchi samples were office bearers of their respective farmer organisations. The study also found that there were no specific farmer organisations for the OFCs in the locations studied.

Table 5.17: Participation in Farmer Organisations – Paddy Farmers in the Sample

Level of Participation	Major			Minor		Rain-fed	Total (N=270) %
	Anu* (N=45)	Amp* (N=45)	Kil* (N=45)	Kur* (N=45)	Pol* (N=45)	Mat* (N=45)	
	%	%	%	%	%	%	
President	4	14	2	3	-	4	4
Secretary	-	2	4	-	7	2	3
Treasurer	4	-	8	-	4	2	3
Committee Member	-	-	2	4	-	2	1
Member	92	84	84	93	89	89	89

Note: Anu* - Anuradhapura, Amp* - Ampara, Kil* - Kilinochchi, Kur* - Kurunegala, Pol* - Polonnaruwa, Mat* - Matara

Source: Field Survey, 2017

Usage of the Harvest

Of the paddy farmers under major irrigation schemes, 80 percent of farmers in Kilinochchi used only less than a quarter of the harvest for consumption and the balance was sold and in Ampara it was 44 percent (Table 5.18). This data is also in line with the main income source as the majority in Ampara (78%) and in Kilinochchi (96%) depending on paddy farming as their main income source (Table 5.9). In Anuradhapura, 38 percent was using 50-74 percent of the harvest for consumption, the balance being sold. Of the farmers under minor irrigation schemes, 67 percent in Polonnaruwa sold more than half of their harvest. However, the highest number of farmers in Kurunegala (48%) and Matara (87%) use the entire harvest for family consumption (Table 5.18). All the OFC farmers in the sample had cultivated OFCs for commercial purposes.

Table 5.18: Usage of the Harvest by Paddy Farmers in the Sample

Usage of the Harvest	Major			Minor		Rain-fed	Total (N=273) %
	Anu* (N=45) %	Amp* (N=45) %	Kil* (N=45) %	Kur* (N=47) %	Pol* (N=45) %	Mat* (N=46) %	
100% consumption	4	-	-	48	2	87	24
75-99% consumption, balance for sale	9	9	-	9	9	11	8
50-74% consumption, balance for sale	38	13	2	20	22	-	16
25-49% consumption, balance for sale	33	33	18	11	29	2	21
<25% consumption, balance for sale	16	44	80	13	38	-	32

Note: Anu* - Anuradhapura, Amp* - Ampara, Kil* - Kilinochchi, Kur* - Kurunegala, Pol* - Polonnaruwa, Mat* - Matara

Two tenant farmers in Kurunegala and one leased farmer in Matara who got the land from the owner to cultivate are also included.

Source: Field Survey, 2017

CHAPTER SIX

Changes with the Introduction of Fertilizer Cash Grant Programme

6.1 Introduction

The Fertilizer Cash Grant Programme has been implemented since 2016 *Yala*, and at the time of the study, the farmers had cultivated 2016 *Yala*, 2016/17 *Maha* and 2017 *Yala*. Therefore, they shared their experiences with respect to these three consecutive seasons. Farmers' experience with respect to the cultivated extent, harvest, usage of inorganic fertilizer, cost of fertilizer, usage of organic fertilizer and logistical arrangements of the programme with the introduction of the FCG programme are explored and the results are presented in this chapter. In addition, perceptions of implementers on the changes are also discussed towards the end of the chapter.

6.2 Cultivation Details

Paddy

As mentioned earlier, paddy farmers had cultivated 2016 *Yala*, 2016/17 *Maha* and 2017 *Yala* seasons receiving the benefits of the FCG at the time of the study. Therefore, the cultivation details were gathered first to gain insight into the cultivated seasons prior to discussing the changes they experienced with the FCG programme. In this section, information was collected only from the farmers who practised cultivation. Therefore, land owners who gave the paddy land to cultivate in the case of two tenant farmers in Kurunegala and one leased farmer in Matara were excluded from this section and information was collected only from the tenant and leased farmers in those cases.

As explained in Chapter Three land extents >0 to ≤ 5 acres / >0 to ≤ 2 hectares were divided into 20 sections of 0.25 acres / 0.1 hectares, and accordingly, the cash grant was between Rs.1,250 to Rs.25,000 per season per farmer. Therefore, the cash grant less than Rs. 5,001 was for a land area of an acre or less. Similarly, cash grant of Rs. 5,001 – 10,000 for more than one to two acres, Rs. 10,001 – 15,000 for more than two to three acres, Rs. 15,001 – 20,000 for more than three to four acres and Rs. 20,001 – 25,000 for more than four to five acres.

a) 2016 Yala Season

All the farmers in Anuradhapura and Ampara had received the cash grant for 2016 *Yala* season while, only 84 percent in Kurunegala, 78 percent in Polonnaruwa, 73 percent in Matara and 22 percent in Kilinochchi had received the grant. Nearly three quarter of farmers (77%) in Kilinochchi had not practised any cultivation for the season due to a

prevailing drought (Table 6.1). Similarly, 20 percent in Polonnaruwa and 13 percent in Kurunegala also abandoned their cultivation for the same reason. Floods prevented nine percent of farmers in Matara from cultivation practices. Further, 16 and two percent of farmers in Matara and Kurunegala respectively had not applied for the grant for lack of awareness. At the same time, two percent each in Matara and Polonnaruwa had not received the grant despite having applied (Table 6.1).

The highest number of farmers under major irrigation schemes, 43 percent in Anuradhapura and 76 percent in Ampara had received a cash grant of Rs.10,001-15,000 in 2016 *Yala* season (Table 6.1). However, it was Rs.5,000 or less in Kilinochchi (16%). Similarly, the highest number of farmers in Kurunegala (36%) and Matara (42%) had also received a cash grant of Rs. ≤5,000. In Polonnaruwa, it was Rs.5,001-10,000 (18%) and Rs.20,001-25,000 (18%).

Of the surveyed districts, a different situation was observed in Anuradhapura compared to other locations. Due to the availability of limited water supply to cultivate, only some of the farmers (29%) had cultivated paddy on their entire paddy fields. Others have resorted to a mixed-cultivation practice as agreed at the *Kanna* meetings (Table 6.4). Further, 27 percent had cultivated only other crops such as soya/ onion/ vegetable/ fruits/ yams/ maize/ black gram on their entire paddy fields. Others (43%) had cultivated other crops with paddy as presented in Table 6.4.

With regard to the status of the harvest, the majority in Ampara (91%), Matara (88%), Kilinochchi (80%) and Polonnaruwa (66%) came off well in their cultivation. However, only 53 percent in Anuradhapura gained success and the majority in Kurunegala (76%) stated that their cultivation season was a failure (Table 6.1). In all the districts barring Matara where pest and disease and animal attacks had an adverse impact, the major reason for the failure was the drought (Table 6.1). In addition, 50 percent in Matara and eight percent in Polonnaruwa stated that the delay in applying fertilizer resulted in harvest failure and five and 25 percent in Anuradhapura and Matara respectively due to the inadequacy of the amount of fertilizer applied (Table 6.1).

Table 6.1: Cultivation Details of 2016 *Yala* Season - Paddy Farmers in the Sample

		Major			Minor		Rain-fed	Total (N=270) %
		Anu* (N=45) %	Amp* (N=45) %	Kil* (N=45) %	Kur* (N=45) %	Pol* (N=45) %	Mat* (N=45) %	
Fertilizer Cash Grant Received (Rs.)	≤5,000	24	7	16	36	13	42	23
	5,001 – 10,000	22	11	2	24	18	29	18
	10,001 – 15,000	43	76	5	13	13	2	25
	15,001 – 20,000	-	2	-	7	16	-	4
	20,001 – 25,000	11	4	-	4	18	-	6
	Received Total Number	45	45	10	38	35	33	206
	No grant due to drought	-	-	77	13	20	-	19
	Farmer had not applied	-	-	-	2	-	16	3
	Not received though applied	-	-	-	-	2	2	1
	No grant due to floods	-	-	-	-	-	9	1
Status of the Harvest	Successful	53	91	80	24	66	88	65
	Not successful	47	9	20	76	34	12	35
	Total Number	45**	45	10	38	35	33	206
Reasons for the Failure (Multiple Responses)	Drought/limited water availability	95	100	100	100	92	25	93
	Pest and disease attacks	5	-	-	-	8	50	6
	Poor quality/ non-availability of weedicide	5	-	-	3	-	25	4
	Delay in applying fertilizer	-	-	-	-	8	50	4
	Insufficient fertilizer	5	-	-	-	-	25	3
	Animal attacks	-	-	-	-	-	50	3
	Total Number	21	4	2	29	12	4	72

Note: Anu*- Anuradhapura, Amp* - Ampara, Kil* - Kilinochchi, Kur* - Kurunegala, Pol* - Polonnaruwa, Mat* - Matara

** - All the farmers had not cultivated paddy on the entire land. Some farmers had cultivated other crops as agreed at the *Kanna* meetings due to availability of limited water.

Source: Field Survey, 2017

b) 2016/17 Maha Season

The majority (93%) in Kurunegala and all the farmers in other districts had received the Fertilizer Cash Grant for 2016/17 *Maha* season. The seven percent of farmers in Kurunegala had not cultivated for the season due to the drought (Table 6.2). Similar to 2016 *Yala*, the highest number of farmers, 36 percent in Anuradhapura and 91 percent in Ampara had received a cash grant of Rs.10,001-15,000 in 2016/17 *Maha* season. It was Rs.20,001-25,000 in Kilinochchi (67%) and Polonnaruwa (36%). The largest number of farmers in Kurunegala (33%) and Matara (58%) had received a cash grant of Rs. ≤5,000 (Table 6.2).

A different situation was observed in Anuradhapura compared to other locations in 2016/17 *Maha* season as well due to the non-availability of enough water. Only 43 percent had cultivated only paddy (Table 6.4). Seven percent had cultivated other crops such as soya/ onion/ vegetable/ fruits/ yams/ maize/ black gram on their paddy fields. Others (50%) had cultivated other crops with paddy as presented in Table 6.4.

With regard to the status of the harvest, the majority in Ampara (89%), Matara (89%) and Kilinochchi (84%) had done well in their cultivation. Only 53 percent in Polonnaruwa and 51 percent in Anuradhapura came off well in their cultivation and the majority in Kurunegala (71%) stated that their cultivation season was a failure as in the previous *Yala* season (Table 6.2). In all the districts except Ampara and Matara, the main reason for the failure was the drought and it was floods in Ampara and Matara (Table 6.2). In addition, 20 percent each in Matara stated that the harvest was not successful due to delay in applying and the insufficient quantity of fertilizer (Table 6.2).

Table 6.2: Cultivation Details of 2016/17 Maha Season - Paddy Farmers in the Sample

		Major			Minor		Rain-fed	Total
		Anu* (N=45) %	Amp* (N=45) %	Kil* (N=45) %	Kur* (N=45) %	Pol* (N=45) %	Mat* (N=45) %	(N=270) %
Fertilizer Cash Grant Received (Rs.)	≤5,000	27	2	9	33	-	58	21
	5,001 – 10,000	24	-	9	31	24	33	20
	10,001 – 15,000	36	91	11	16	24	9	31
	15,001 – 20,000	7	-	4	9	16	-	6
	20,001 – 25,000	7	7	67	4	36	-	20
	Received Total Number	45	45	45	42	45	45	267
	No grant due to drought	-	-	-	7	-	-	1
Status of the Harvest	Successful	51	89	84	29	53	89	66
	Not successful	49	11	16	71	47	11	34
	Total Number	45**	45	45	42	45	45	267
Reasons for the Failure (Multiple Responses)	Drought/limited water availability	95	-	100	100	81	20	84
	Floods	-	100	-	-	19	40	12
	Insufficient fertilizer	-	-	-	-	-	20	1
	Delay in applying fertilizer	-	-	-	-	-	20	1
	Pest and disease attacks	-	-	-	-	-	20	1
	Poor quality/ non- availability of weedicide	4	-	-	-	-	-	1
	Poor irrigation canals	4	-	-	-	-	-	1
	Total Number	22	5	7	30	21	5	90

Note: Anu*- Anuradhapura, Amp* - Ampara, Kil* - Kilinochchi, Kur* - Kurunegala, Pol* - Polonnaruwa, Mat* - Matara

** - All the farmers had not cultivated paddy on the entire land. Some farmers had cultivated other crops as agreed at the *Kanna* meetings due to availability of limited water.

Source: Field Survey, 2017

c) 2017 Yala Season

Only 98 percent in Ampara, 95 percent in Matara, 91 percent in Anuradhapura, 75 percent in Polonnaruwa, 35 percent in Kilinochchi and 11 percent in Kurunegala had received the Fertilizer Cash Grant for 2017 *Yala* season. Further, 89 percent in Kurunegala, 64 percent in Kilinochchi, 22 percent in Polonnaruwa and seven percent in Anuradhapura left their fields uncultivated due to drought (Table 6.3). Two percent each in Anuradhapura, Polonnaruwa and Matara had not received the grant despite having applied for (Table 6.3). The highest number of farmers, 44 percent in Anuradhapura, 83 percent in Ampara and seven percent in Kurunegala had received a cash grant of Rs.5,001-10,000 in 2017 *Yala* season (Table 6.3). It was equal to Rs.5,000 or less in Kilinochchi (24%), Polonnaruwa (33%) and Matara (56%).

Similar to previous *Maha* and *Yala* seasons, not all the farmers in Anuradhapura had cultivated paddy on their entire paddy fields due to the poor water supply. Only 20 percent had cultivated only paddy and 30 percent had cultivated other crops such as soya/ onion/ vegetable/ fruits/ yams/ maize/ black gram on their entire paddy fields in place of paddy. Others (50%) had resorted to a mixed cultivation as presented in Table 6.4.

With regard to the status of the harvest, the majority only in Kilinochchi (87%) had achieved success in their cultivation. Only 58 percent in Matara, 50 percent each in Ampara and Polonnaruwa and 49 percent in Anuradhapura had succeeded and the majority (80%) in Kurunegala stated that their cultivation season was a failure (Table 6.3). As in previous *Yala*, in all the districts except Matara where floods impeded the cultivation, the main reason for the failure was the drought (Table 6.3). In addition, 29 percent in Polonnaruwa and 14 percent in Ampara stated that the harvest failed due to the application of insufficient quantity of fertilizer. Further, 28 percent in Matara and six percent in Polonnaruwa stated that delay in applying fertilizer and poor quality of fertilizer respectively were reasons for their failure (Table 6.3).

Table 6.3: Cultivation Details of 2017 *Yala* Season - Paddy Farmers in the Sample

		Major			Minor		Rain-fed	Total
		Anu* (N=45) %	Amp* (N=45) %	Kil* (N=45) %	Kur* (N=45) %	Pol* (N=45) %	Mat* (N=45) %	(N=270) %
Fertilizer Cash Grant Received (Rs.)	≤5,000	24	2	24	2	33	56	24
	5,001 – 10,000	44	83	2	7	22	33	32
	10,001 – 15,000	13	13	2	-	11	7	8
	15,001 – 20,000	4	-	-	2	4	-	2
	20,001 – 25,000	4	-	7	-	4	-	3
	Received Total Number	41	44	16	5	34	43	183
	No grant due to drought	7	-	64	89	22	-	30
	Not received though applied	2	-	-	-	2	2	1
	Grant transferred to the next season	-	2	-	-	-	-	<1
	No cultivation	-	-	-	-	-	2	<1
Status of the Harvest	Successful	49	50	87	20	50	58	54
	Not successful	51	50	13	80	50	42	46
	Total Number	41**	44	16	5	34	43	183
Reasons for the Failure (Multiple Responses)	Drought/limited water availability	95	86	100	100	94	5	74
	Floods	-	-	-	-	6	89	20
	Insufficient fertilizer	-	14	-	-	29	-	9
	Delay in applying fertilizer	-	-	-	-	-	28	6
	Poor quality/non-availability of weedicides	5	-	-	-	-	28	7
	Animal attacks	5	-	-	-	-	17	5
	Pest and disease attacks	-	-	-	-	12	-	2
	Poor quality fertilizer	-	-	-	-	6	-	1
	Total Number	21	22	2	4	17	18	84

Note: Anu* - Anuradhapura, Amp* - Ampara, Kil* - Kilinochchi, Kur* - Kurunegala, Pol* - Polonnaruwa, Mat* - Matara

** - All the farmers had not cultivated paddy on the entire land. Some farmers had cultivated other crops as agreed at the *Kanna* meetings due to availability of limited water.

Source: Field Survey, 2017

Table 6.4: Cultivation Details of Paddy Farmers in the Anuradhapura Sample

Composition of Cultivation	2016 Yala (N=45) %	2016/17 Maha (N=45) %	2017 Yala (N=41) %
100% paddy	29	43	20
76%-99% paddy and rest soya/ vegetable	10	7	11
51%-75% paddy and rest soya/ onion/ vegetable/ fruits/ maize	6	11	9
26%-50% paddy and rest soya/ onion/ vegetable/ yams/ maize	25	30	25
1%-25% paddy and rest soya/ onion/ vegetable/ black gram	2	2	5
No paddy and soya/ onion/ vegetable/ fruits/ yams/ maize/ black gram	27	7	30

Source: Field Survey, 2017

Other Field Crops

In the case of selected OFC, land extents ranging from >0 to ≤2.5 acres / >0 to ≤1 hectare were divided into 10 sections of 0.25 acres / 0.1 hectares, and accordingly, the Fertilizer Cash Grant ranged between Rs.1,000 to Rs.10,000 per year per farmer. Therefore, the cash grant less than Rs. 2,001 was for an extent equal to 0.5 acre or less. Similarly, cash grant of Rs. 2,001 – 4,000 for more than 0.5 to one acre, Rs. 4,001 – 6,000 for more than one to 1.5 acres, Rs. 6,001 – 8,000 for more than 1.5 to two acres and Rs. 8,001 – 10,000 for more than two to 2.5 acres.

a) Cultivation in 2016

Unlike in the context of paddy, all the OFC farmer participants in the study had received the Fertilizer Cash Grant in 2016. The highest number of potato (80%) and chilli farmers (73%) had received a grant of equal to Rs. 2,000 or less. It was Rs. 2,001 – 4,000 for onion farmers (40%) and Rs. 6,001 – 8,000 (43%) and Rs. 8,001 – 10,000 (43%) for maize farmers (Table 6.5). In all the locations, farmers had cultivated other types of OFCs than the main crop and it was significant among onion farmers as 73 percent of them had cultivated chilli too (Table 6.5). The majority of chilli farmers (80%) had obtained a successful harvest while, 57 percent of maize, 47 percent of potato and 33 percent of onion farmers had got a bumper harvest (Table 6.5). The main reason highlighted by all the farmers except onion farmers for the failure was the drought and it was floods for the onion farmers. In addition, 25 percent of potato farmers stated poor quality of fertilizer as a reason for their failure (Table 6.5).

Table 6.5: Cultivation Details of OFC Farmers in the Sample - 2016

		OFC Farmers				
		Potato (N=30) %	Onion (N=30) %	Chilli (N=30) %	Maize (N=30) %	Total (N=120) %
Fertilizer Cash Grant Received (Rs.)	≤2,000	80	17	73	-	43
	2,001 – 4,000	13	40	23	7	21
	4,001 – 6,000	3	23	-	7	8
	6,001 – 8,000	3	17	3	43	17
	8,001 – 10,000	-	3	-	43	12
Type of OFC Cultivated	Potato	100	3	-	-	26
	Onion	13	100	3	-	29
	Chilli	27	73	100	3	51
	Soya	3	-	-	-	1
	Maize	-	-	10	100	28
Status of the Harvest	Successful	47	33	80	57	54
	Not successful	53	67	20	43	46
Reasons for the Failure (Multiple Responses)	Drought/limited water availability /floods	88	100	67	100	93
	Pest and disease attacks	19	5	33	8	13
	Poor quality/ non-availability of weedicides	6	-	-	-	2
	Animal attacks	6	-	-	-	2
	Poor quality fertilizer	25	-	-	-	7
	Poor quality seeds	13	-	-	-	4
	Total Number of Farmers	16	20	6	13	55

Source: Field Survey, 2017

b) Cultivation in 2017

In 2017, OFC farmers stated that they had not received the Fertilizer Cash Grant that they had applied for at the time of the study.

Therefore, OFC farmers shared their experiences regarding the changes mainly compared to experiences of one season.

6.3 Changes in the Cultivated Extent

The majority of paddy farmers (89%) have not witnessed any sizeable change in their cultivated extent after 2016 (Table 6.6 and Figure 6.1). Only one farmer under major irrigation schemes (Kilinochchi district) has his cultivated land extent increased as he has leased more land for paddy after 2016. Two farmers from Kurunegala and three from Polonnaruwa have added to the extent of land with purchases and inheritance. One farmer in Matara has increased the land extent as he regained the paddy field from the son.

However, eight percent of farmers have experienced a drop in cultivated extent, more notable in Ampara and Kilinochchi (Table 6.6 and Figure 6.1). Of the seven farmers in Ampara, one farmer has not received the tenant paddy field after 2016 and five farmers have suffered this problem due to the *Bethma* practice after 2016. Only one farmer has slashed the cultivated extent due to delays in receiving the Fertilizer Cash Grant and not receiving the tenant paddy field after 2016. Five farmers in Kilinochchi have gone through the same experience. Two of them attributed the drop to the insufficiency of the grant to purchase the required quantity of fertilizer, delay in getting the grant and to the drought. Another two farmers claimed the reason delay and one farmer due to the insufficiency of the grant to buy the required quantity of fertilizer. One farmer in Anuradhapura attributed it to the prolonged drought situation. Three farmers each in Kurunegala and Polonnaruwa have reduced their cultivated extent due to drought, high cost of labour and because of not receiving the tenant paddy field again. Three farmers in Matara also have their land extent reduced resultant on the delay in receiving the Fertilizer Cash Grant, animal threats and selling out the land in an emergency situation.

Therefore, of the 22 farmers who experienced a drop in cultivated extent, seven (five in Kilinochchi, one each in Ampara and Matara) were affected by the implications of the FCG programme such as delays in getting and the insufficiency of the grant. In other words, three percent of the paddy farmers from the entire sample more prominently noticing under major irrigation schemes had their cultivated land extent reduced due to the issues associated with the FCG programme.

Table 6.6: Changes in the Cultivated Extent - Paddy Farmers in the Sample

Change	Major			Minor		Rain-fed	Total (N=270) %
	Anu* (N=45) %	Amp* (N=45) %	Kil* (N=45) %	Kur* (N=45) %	Pol* (N=45) %	Mat* (N=45) %	
Extent increased	-	-	2	5	7	2	3
Extent decreased	2	16	11	7	7	7	8
No change in extent	98	84	87	89	87	91	89

Note: Anu* - Anuradhapura, Amp* - Ampara, Kil* - Kilinochchi, Kur* - Kurunegala, Pol* - Polonnaruwa, Mat* - Matara

Source: Field Survey, 2017

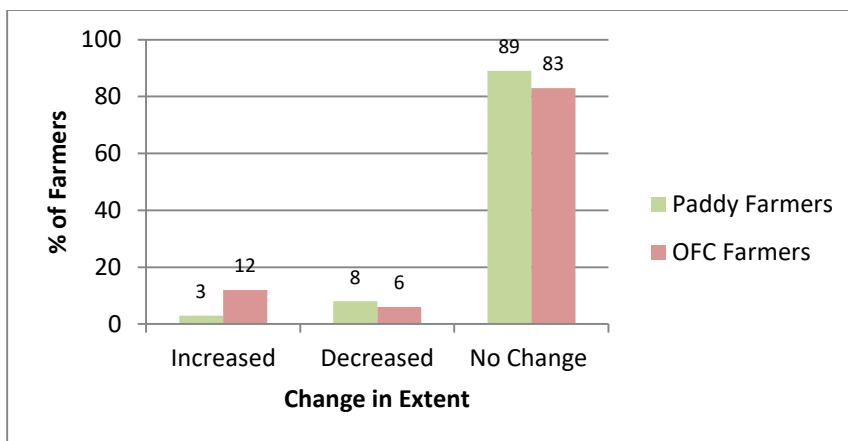
Similarly, majority of OFC farmers (83%) have also not experienced a significant change in the cultivated extent. Conversely, 12 percent of farmers have marked an increase and six percent a decrease in the cultivated extent (Table 6.7 and Figure 6.1). Further, 14 OFC farmers in the entire sample have noted an increase in the cultivated extent and 13 farmers attributed it to targeting a higher income, obtaining more leased land to cultivate, inheriting land from parents and availability of increased labour with their offspring giving them a hand. Only one maize farmer stated that he increased the extent as he received the grant in 2016. Therefore, only one percent of OFC farmers in the entire sample had increased the extent with the introduction of the FCG programme.

On the other hand, seven OFC farmers had claimed a decrease in the cultivated extent and the reasons explained by five of them include part of the land being mortgaged in need of money or submerged by water, increased labour cost, lack of capital and shifting to perennial crops. One each of potato and maize farmers said they had to curtail the cultivated extent as they could not buy sufficient fertilizer with the introduction of the FCG programme. Therefore, of the entire OFC sample, only two percent had to decrease the cultivated extent due to the issues of the FCG programme.

Table 6.7: Changes in the Cultivated Extent - OFC Farmers in the Sample

Change	OFC Farmers				
	Potato (N=30) %	Onion (N=30) %	Chilli (N=30) %	Maize (N=30) %	Total (N=120) %
Extent increased	10	13	10	13	12
Extent decreased	10	3	3	7	6
No change in extent	80	83	87	80	83

Source: Field Survey, 2017



Source: Field Survey, 2017

Figure 6.1: Changes in the Cultivated Extent

6.4 Changes in Harvest

In contrast to the changes in extent, the highest number of farmers (56%) have experienced a change in their harvest after 2016 (Table 6.8). Four percent of farmers had accrued an increased harvest and this situation was noticed in all the locations except in Polonnaruwa. The reason for this increase in the harvest was the good quality of fertilizer as claimed by one farmer in Anuradhapura. Farmers in Ampara observed different reasons: an increase in harvest due to good quality of fertilizer and less pest and disease attacks, application of fertilizer at the right time, good quality fertilizer and application of more inorganic fertilizer. Two farmers in Kilinochchi said that it was due to good quality of fertilizer and less pest and disease attacks. Two farmers in Kurunegala attributed this increase in harvest to good quality fertilizer and the use of more organic fertilizer in the field. Two in Matara said that it was due to the application of fertilizer in time, and refraining from the over usage of inorganic fertilizer. Therefore, all the reasons mentioned by the farmers behind the increase of the harvest were attributed to fertilizer usage and the main reason was the availability of good quality fertilizer.

A little over half of the paddy farmers in the sample (52%) notably in Anuradhapura (76%) and Polonnaruwa (71%) have gone through a drop in the harvest. In addition, such decreases were noted by 58 percent of farmers in Ampara and 61 percent in Kurunegala. The majority in Kilinochchi (78%) and Matara (67%) have not experienced any significant change in their harvest (Table 6.8).

Table 6.8: Changes in Harvest - Paddy Farmers in the Sample

Change	Major			Minor		Rain-fed	Total (N=270) %
	Anu* (N=45) %	Amp* (N=45) %	Kil* (N=45) %	Kur* (N=45) %	Pol* (N=45) %	Mat* (N=45) %	
Harvest increased	2	9	4	4	-	4	4
Harvest decreased	76	58	18	61	71	28	52
No change in harvest	22	33	78	34	29	67	44

Note: Anu* - Anuradhapura, Amp* - Ampara, Kil* - Kilinochchi, Kur* - Kurunegala, Pol* - Polonnaruwa, Mat* - Matara

Source: Field Survey, 2017

An analysis of the findings unfolds that the main reason for the decreased harvest is the drought (76%) mainly in all the locations except Kilinochchi and Matara (Table 6.9). The reasons mentioned by the farmers for this drop associated with inorganic fertilizer usage were the inability to buy the required amount of fertilizer (25%), delay in receiving the grant (12%) and low quality of fertilizer (1%). In addition, floods (11%), animal attacks (4%), decreased soil fertility (4%), pest and disease attacks (3%) and non-availability of effective weedicides (1%) were the other reasons for the decreased harvest (Table 6.9). Eventually, difficulties in the usage of inorganic fertilizer were observed in all the locations and the most serious issue was the inability to buy the required quantity of fertilizer subsequent to the introduction of the FCG programme.

Table 6.9: Reasons for Decreased Harvest - Paddy Farmers in the Sample

Reason	Major			Minor		Rain-fed	Total (N=141) %
	Anu* (N=34) %	Amp* (N=26) %	Kil* (N=8) %	Kur* (N=28) %	Pol* (N=32) %	Mat* (N=13) %	
Drought	85	65	63	93	91	8	76
Inability to buy the required amount of fertilizer	32	38	25	7	22	23	25
Delay in receiving the grant	3	4	88	7	3	38	12
Floods	-	19	-	-	16	38	11
Animal attacks	12	4	-	-	-	-	4
Decreased soil fertility	3	4	13	-	-	16	4
Pest and disease attacks	3	8	-	-	-	8	3
Low quality of fertilizer	6	-	-	-	-	-	1
Non availability of effective weedicide	-	-	-	4	-	-	1

Note: Anu* - Anuradhapura, Amp* - Ampara, Kil* - Kilinochchi, Kur* - Kurunegala, Pol* - Polonnaruwa, Mat* - Matara

Multiple Responses

Source: Field Survey, 2017

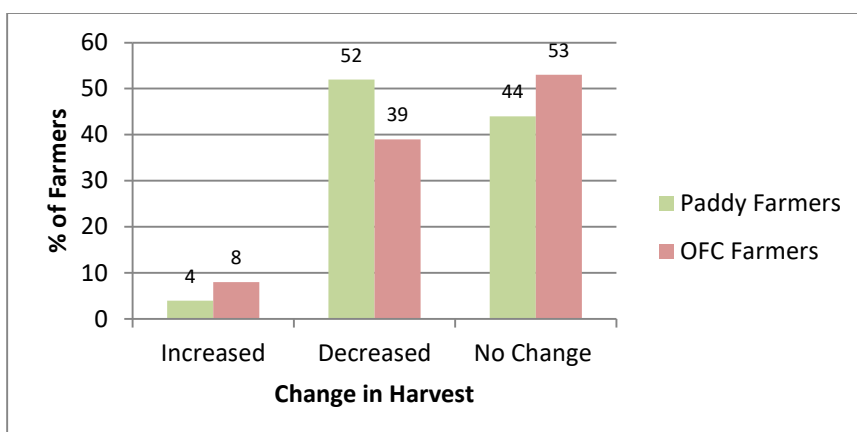
With respect to OFCs, the majority of farmers did not experience a change in cultivated extent or in the harvest (Figures 6.1 and 6.2). However, only 10 percent of potato farmers were among them compared to others (Table 6.10). An increase in harvest was achieved only by maize (17%), potato (10%) and chilli (7%) farmers. Of them, all the farmers except one maize farmer attributed the increase to either good quality of fertilizer or application of required amount of inorganic fertilizer. They further stated that they could increase the quantity of inorganic fertilizer used with the introduction of the grant. One maize farmer attributed it to favourable climate.

Of the entire OFC farmers, 39 percent claimed a reduction in their harvest and it was significant among potato farmers compared to others (Table 6.10). As in the case of paddy, the main reason for the decrease in OFC harvest was also the drought (45%) and it was significantly noted among potato farmers (67%). However, for onion farmers it was floods (91%). Issues related to inorganic fertilizer usage as perceived by farmers centred on the inability to buy the required quantity of fertilizer (21% of potato and 44% of maize farmers) and its poor quality (25% of potato and 11% of maize farmers). In addition, the other reasons mentioned by the farmers for the reduction of the harvest were pest and disease attacks, poor quality seeds, heavy rains, adverse climatic changes, animal attacks and decreased soil fertility.

Table 6.10: Changes in Harvest - OFC Farmers in the Sample

Change	OFC Farmers				
	Potato (N=30) %	Onion (N=30) %	Chilli (N=30) %	Maize (N=30) %	Total (N=120) %
Harvest increased	10	0	7	17	8
Harvest decreased	80	37	10	30	39
No change in harvest	10	63	83	53	53

Source: Field Survey, 2017

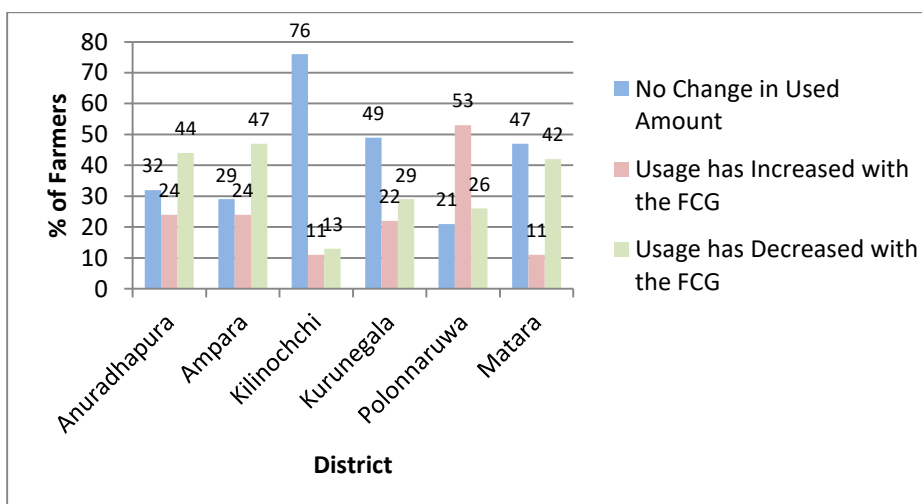


Source: Field Survey, 2017

Figure 6.2: Changes in Harvest

6.5 Changes in Usage of Inorganic Fertilizer

In exploring the changes in the usage of inorganic fertilizer after 2016, it can be noted that a large number of farmers in Kilinochchi (76%), Kurunegala (49%) and Matara (47%) have not experienced a significant change in the quantity of inorganic fertilizer they used for the paddy fields entitled for the subsidy programme while, a considerable number of farmers in Anuradhapura (44%) and Ampara (47%) have experienced a decrease and in Polonnaruwa (53%) it was an increase (Figure 6.3). Therefore, fluctuations were observed in all the locations in the usage of the quantity of inorganic fertilizer at reasonable levels.



Source: Field Survey, 2017

Figure 6.3: Changes in Usage of Inorganic Fertilizer - Paddy Farmers in the Sample

With reference to the increase of the quantity, 64 farmers in the entire sample have upped the usage with, 47 percent increasing it by one kg/ac to 25kg/ac more notably in Kilinochchi (60%), Kurunegala (56%), Polonnaruwa (52%) and Ampara (45%). Next, 39 percent have increased the quantity by 26 kg/ac to 50kg/ac mostly in Anuradhapura (36%) and Matara (60%). Increases by four farmers in Anuradhapura from 76kg/ac to 125kg/ac, two in Ampara from 51kg/ac to 100kg/ac, two in Kurunegala from 51kg/ac to 75kg/ac and one in Polonnaruwa from 76kg/ac to 100kg/ac are some substantial changes (Table 6.11). As stated by the farmers, the main reasons to increase the quantity were the low soil fertility (88%) and water scarcity (9%) which was common to all the districts (Table 6.11). In addition, two and one farmer in Ampara and Kurunegala respectively were of the view that it was more convenient for them to purchase fertilizer in 50kg bags than go for lesser quantities and it had resulted in increased usage. Further, according to four farmers, poor quality of fertilizer (Polonnaruwa), the delay in getting the cash grant (Ampara), overuse as purchasing was done on several occasions (Kurunegala) and use of the left over fertilizer (Kurunegala) have increased the quantity used (Table 6.11).

On the other hand, 89 farmers in the entire sample have reduced the inorganic fertilizer usage prominently in Ampara, Anuradhapura and Matara compared to other locations (Table 6.11). Of them, nearly half (45%) have reduced the quantity from one kg/ac to 25kg/ac more notably in Matara (74%). Of the Anuradhapura farmers, 55 percent have curtailed the quantity by 26kg/ac to 50kg/ac while, 67 percent of Ampara farmers by one kg/ac to 50kg/ac. In Kilinochchi, half the farmers have reduced the amount by 51kg/ac to 75kg/ac. In addition, two farmers each in Anuradhapura and Ampara and one farmer in Polonnaruwa had decreased the fertilizer quantity by more than 76kg/ac (Table 6.11). In exploring the reasons for the curtailed usage, 79 percent of the farmers attributed it to the insufficient grant largely in locations under major and minor irrigation schemes (Table 6.11). However, for the farmers under rain-fed the main reason was delay in getting the grant. In addition, 13 percent of farmers have cut down the quantity as it was the required quantity by their paddy fields and this was noted in all the locations. Two and one farmers in Kilinochchi and Kurunegala respectively had to reduce the quantity due to the non-availability of fertilizer in the market at the required time. Further, there was a fertilizer shortage in the country, especially, in December 2017. Data collection in other districts excluding Kilinochchi was completed before the fertilizer shortage and therefore, farmers in other districts had not been affected by that. It was interesting to note that one farmer each in Anuradhapura and Ampara and two farmers in Kurunegala have increased the usage of organic fertilizer consequently reducing the quantity of inorganic fertilizer. Two farmers in Ampara stated that they have reduced the quantity as the fertilizer after 2016 were in good quality unlike in the past. Further, two farmers in Kurunegala stated that they had to decrease the quantity as the cash grant had been used to cover other expenses and due to fertilizer being purchased on several occasions (Table 6.11).

Table 6.11: Changes in Usage of Inorganic Fertilizer under Fertilizer Subsidy and Fertilizer Cash Grant - Paddy Farmers in the Sample

		Major			Minor		Rain-fed	Total
		Anu*	Amp*	Kil*	Kur*	Pol*	Mat*	
Change in Used Amount (%)	No Change in used amount	32	29	76	49	21	47	42
	Usage has increased after the FCG	24	24	11	22	53	11	24
	Usage has decreased after the FCG	44	47	13	29	26	42	34
	Total	45	45	45	41	43	45	264
Details of Usage Increment (kg/ac)**	Usage has increased by one to 25kg	3	5	3	5	12	2	30
	Usage has increased by 26 to 50kg	4	4	2	2	10	3	25
	Usage has increased by 51 to 75kg	-	1	-	2	-	-	3
	Usage has increased by 76 to 100kg	3	1	-	-	1	-	5
	Usage has increased by 101 to 125kg	1	-	-	-	-	-	1
	Total	11	11	5	9	23	5	64
Reasons for the Increment * and **	Decreased soil fertility	8	8	4	8	23	5	56
	Due to water scarcity	3	-	1	-	1	-	5
	Convenience of purchasing 50 kg fertilizer bags than in less amounts	-	2	-	1	-	-	3
	Excess usage of fertilizers since purchasing done on several occasions	-	-	-	1	-	-	1
	Low quality in fertilizers	-	-	-	-	1	-	1
	Had to increase as cash grant received late	-	1	-	-	-	-	1
	Remaining fertilizers from the previous programme were used	-	-	-	1	-	-	1
	Total	11	11	5	9	23	5	64
Details of Usage Decrement (kg/ac)**	Usage has decreased by one to 25kg	7	7	2	5	5	14	40
	Usage has decreased by 26 to 50kg	11	7	1	7	2	4	32
	Usage has decreased by 51 to 75kg	-	5	3	-	3	1	12
	Usage has decreased by 76 to 100kg	1	1	-	-	1	-	3
	Usage has decreased by > 101kg	1	1	-	-	-	-	2
	Total	20	21	6	12	11	19	89
Reasons for the Decrement * and **	Grant was not sufficient	20	20	6	6	10	8	70
	Delay in receiving the grant	-	3	4	4	2	11	24
	The applied amount was sufficient	1	4	1	2	1	3	12
	No fertilizer at the market	-	-	2	1	-	2	5
	Used more organic fertilizer	1	1	-	2	-	-	4
	Due to adverse climatic changes	4	-	-	-	-	-	4
	Good quality fertilizer	-	2	-	-	-	-	2
	Cash Grant was used for other purposes	-	-	-	1	-	-	1
	Reduction since purchasing done on several occasions	-	-	-	1	-	-	1
	Utilization of tea fertilizers for paddy	-	-	-	-	-	1	1
Total	20	21	6	12	11	19	89	

Note: Anu* - Anuradhapura, Amp* - Ampara, Kil* - Kilinochchi, Kur* - Kurunegala, Pol* - Polonnaruwa, Mat* - Matara
 In Kurunegala and Polonnaruwa, four and two farmers respectively have not responded as they have not applied fertilizers or have partly applied fertilizers after 2016 due to drought.

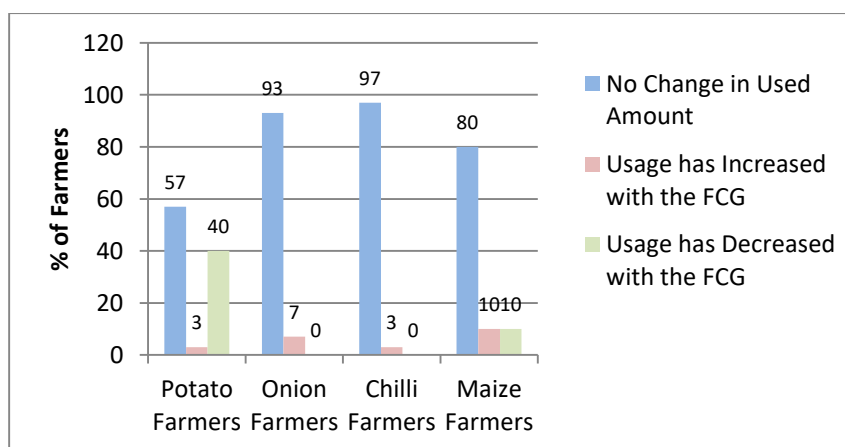
* - Multiple Responses

** - Count and not the percentage

Source: Field Survey, 2017

In contrast to paddy farmers, the majority of the OFC farmers (97% chilli, 93% onion, 80% maize and 57% potato) have not made any changes in their use of inorganic fertilizer after the introduction of the FCG programme (Figure 6.4). Further, an increase in usage was observed among all the types of OFC farmers and there were seven farmers in that category who have increased the quantity in the range of one kg/ac to 150kg/ac (Table 6.12). The main reason for onion and chilli farmers to increase the quantity was the deterioration in soil fertility while, it was the poor quality of fertilizer for potato farmers. Interestingly, almost all the maize farmers stated that they have increased the quantity resultant upon the cash grant they received in 2016.

However, 12 potato and three maize farmers have used a lesser quantity of fertilizer and it was not observed among the chilli and onion farmers. All the potato farmers have cut down the usage by more than 150kg/ac, while, one maize farmer each in the decreased category reduced the use by one kg/ac to 50kg/ac, 51kg/ac to 100kg/ac and more than 150kg/ac (Table 6.12). The main reason identified by the potato farmers for the decrease was the high cost of fertilizer and insufficiency of the grant. In addition, two farmers claimed that the quality of fertilizer was tempting them to use lesser dosage. The reasons for maize farmers were the insufficiency of the grant, high cost of fertilizer and the delay in receiving the grant (Table 6.12).



Source: Field Survey, 2017

Figure 6.4: Changes in Usage of Inorganic Fertilizer - OFC Farmers in the Sample

Table 6.12: Changes in Usage of Inorganic Fertilizer under Fertilizer Subsidy and Fertilizer Cash Grant - OFC Farmers in the Sample

		OFC Farmers				
		Potato	Onion	Chilli	Maize	Total
Change in Used Amount (kg/ac) (%)	No Change in used amount	57	93	97	80	82
	Usage has increased with the FCG	3	7	3	10	6
	Usage has decreased with the FCG	40	-	-	10	13
	Total	30	30	30	30	120
Details of Usage Increment (kg/ac)**	Usage has increased by one to 50kg	-	1	-	2	3
	Usage has increased by 51 to 100kg	1	1	-	-	2
	Usage has increased by 101 to 150kg	-	-	1	1	2
	Total	1	2	1	3	7
Reasons for the Increment * and**	Decreased soil fertility	-	2	1	1	4
	Increased due to receipt of the grant	-	-	-	3	3
	Poor quality in fertilizer	1	-	-	-	1
	Total	1	2	1	3	7
Details of Usage Decrement (kg/ac)**	Usage has decreased by one to 50kg	-	-	-	1	1
	Usage has decreased by 51 to 100kg	-	-	-	1	1
	Usage has decreased by 101 to 150kg	-	-	-	-	-
	Usage has decreased by >150kg	12	-	-	1	13
	Total	12	0	0	3	15
Reasons for the Decrement * and**	High cost of fertilizer	10	-	-	1	11
	Grant was not sufficient	6	-	-	2	8
	Delay in getting the grant	1	-	-	1	2
	Good quality fertilizer	2	-	-	-	2
	The applied amount was sufficient	1	-	-	-	1
	Total	12	0	0	3	15

Note: * - Multiple Responses

** - Count and not the percentage

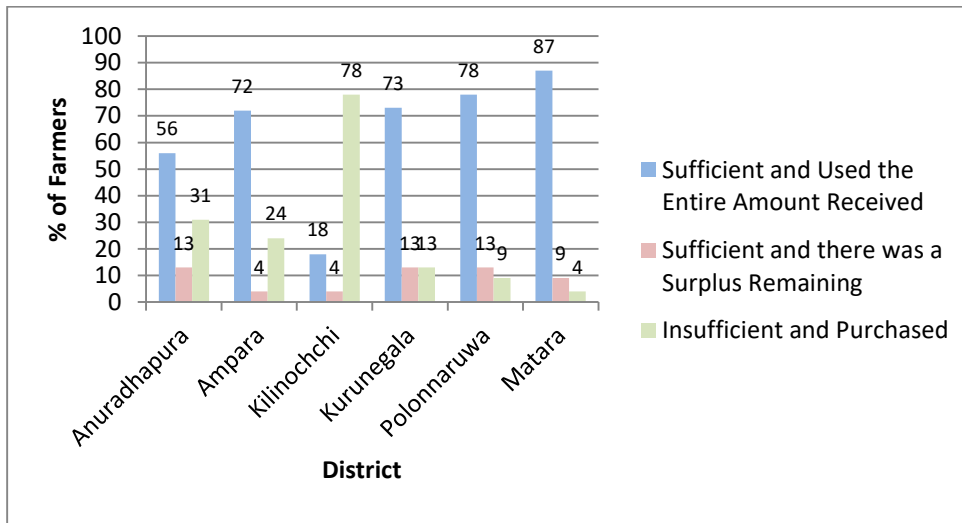
Source: Field Survey, 2017

6.6 Changes in Cost of Fertilizer

After exploring the changes in the quantity of fertilizer used, next, the cost of fertilizer and changes in fertilizer cost with regard to the paddy plots entitled to the subsidy programme were investigated.

Before considering the cost at the time of the fertilizer subsidy programme, sufficiency of the fertilizer provided by the government at that time was investigated. The study reveals that the majority of farmers in all the districts except in Kilinochchi were able to manage with the quantity of fertilizer provided by the state under the subsidy

programme before 2016 and it was more notable in Matara and less in Anuradhapura (Figure 6.5). However, majority of farmers in Kilinochchi (78%) claimed the inadequacy of the quantity they got forcing them to purchase the balance at the open market. Of the other districts, the insufficiency was felt more sharply in Anuradhapura (31%) and Ampara (24%). In addition, fewer farmers reported of an outstanding balance from what they received and it was 13 percent in Anuradhapura, Kurunegala and Polonnaruwa, nine percent in Matara and four percent in Ampara and Kilinochchi (Figure 6.5).



Source: Field Survey, 2017

Figure 6.5: Sufficiency of Fertilizer Provided by the Fertilizer Subsidy Programme - Paddy Farmers in the Sample

With reference to the cost of fertilizer during the period of the fertilizer subsidy programme, the majority of the farmers under rain-fed cultivation (91%) have spent Rs. 2,500 or less and it was a significant difference compared to other locations (Table 6.13). This confirms with the data that the majority of these farmers were having their own paddy fields of one acre or less. The majority in Anuradhapura (73%) and Kurunegala (90%) have spent Rs. 5,000 or less to purchase fertilizer. Reflecting the same, most of the farmers in Ampara (93%) and Polonnaruwa (86%) have spent Rs. 7,500 or less. However, in Kilinochchi, the majority (61%) have spent more than Rs. 7,500 on fertilizer (Table 6.13). This can be explained by the fact that 76 percent of farmers in Kilinochchi were having paddy fields of more than four acres in extent and 78 percent of farmers have purchased fertilizer at the open market as the fertilizer provided at Rs.500/50kg was not sufficient for their cultivation.

With the switch over of the programme to a cash grant in 2016, the expenditure pattern on fertilizer applied on the same paddy land extent was investigated and is presented in Table 6.13. The majority of farmers under major irrigation schemes (88% in

Anuradhapura, 91% in Ampara and 98% in Kilinochchi) have spent more than the cash grant they received on fertilizer. Only 12 percent in Anuradhapura, nine percent in Ampara and two percent in Kilinochchi have not spent on fertilizer after the cash grant as the total expenditure they spent on fertilizer was equal to the amount of the cash grant they received (Figure 6.6 and Table 6.13).

However, the expenditure pattern was different in minor irrigation schemes and under rain-fed cultivation. The majority of farmers under minor irrigation schemes (63% in Kurunegala and 81% in Polonnaruwa) have also spent more than the cash grant and however, the percentages were low compared to major irrigation schemes. Further, 22 and 16 percent of farmers in Kurunegala and Polonnaruwa respectively have incurred no expenditure on fertilizer with the cash grant as their total expenditure on fertilizer was equal to the amount of cash grant they received. Interestingly, 15 and two percent of farmers in Kurunegala and Polonnaruwa respectively were able to save some from the grant as the expenditure on fertilizer was less than the grant amount (Figure 6.6). The farmers claimed that they have used the balance on consumption and on purchasing other inputs for cultivation. Further, one farmer in Kurunegala had used that money to settle a loan and another to purchase organic fertilizer. As stated earlier, the expenditure pattern in Matara was different from that of both major and minor irrigation schemes and only 51 percent of farmers have spent on fertilizer while, 22 percent have no expenditure and 27 percent have been able to save some from the grant as the expenditure on fertilizer was less than the grant amount (Figure 6.6). They have used the balance money on consumption, purchasing other inputs and settling loans. Two farmers stated that they used the balance on liquor and smoking.

In that context, of the farmers who had spent on fertilizer after 2016, half of them in Anuradhapura had spent Rs. 7,500 or less followed by 23 percent of farmers spending between Rs. 7,501 -10,000 (Table 6.13). In Ampara and Polonnaruwa, two thirds of the farmers spent Rs. 7,500 or less followed by 15 and 11 percent of farmers respectively spending between Rs. 10,001 -12,500. However, the majority (81%) in Kilinochchi had spent more than Rs. 10,000. In contrast, 73 and 70 percent in Kurunegala and Matara respectively had spent Rs. 2,500 or less on fertilizer.

As stated earlier, 12, six and one farmer in Matara, Kurunegala and Polonnaruwa respectively had been able to save money from the grant after spending on fertilizer and of them 14 farmers (10 in Matara and four in Kurunegala) had saved Rs. 2,500 or less (Table 6.13).

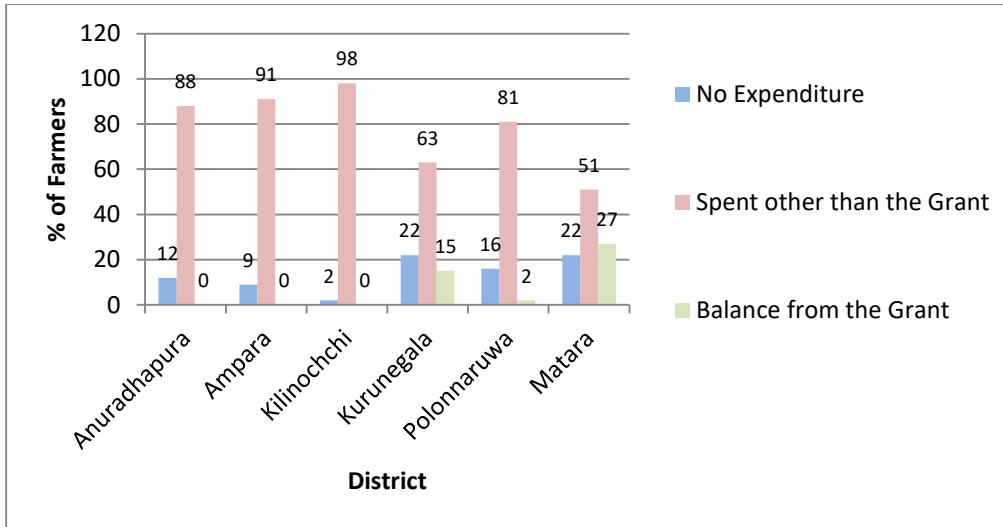
Next, a comparison between the two programmes with results is presented in Figure 6.7. Accordingly, a large number of farmers under major irrigation schemes (89% in Kilinochchi, 76% in Anuradhapura and 62% in Ampara) had to spend more on fertilizer

after the Fertilizer Cash Grant Programme. Further, 73 and 44 percent of farmers in Anuradhapura and Ampara had to spend over Rs. 5,000 or less (Table 6.13). However, 57 percent in Kilinochchi had to spend above Rs. 5,000 additionally. At the same time, some farmers in Anuradhapura were able to either spend Rs. 2,500 or less (12%) or saved (12%)² (two farmers Rs. 2,500 or less and one farmer between Rs. 2,501-5,000) compared to the fertilizer subsidy (Figure 6.7 and Table 6.13). In Ampara and Kilinochchi, 20 and nine percent of farmers respectively were able to spend less (Rs. 2,500 or less - all in Ampara and majority in Kilinochchi) while, nine and two percent respectively had saved money (four farmers in Ampara - Rs. 5,000 or less and one farmer in Kilinochchi more than Rs. 5,000).

A similar pattern was observed in Polonnaruwa as well and accordingly, 65 percent had to spend more (60% had to spend Rs. 5,000 or less) while, 19 percent had saved money (four farmers - Rs. 2,500 or less, one farmer - Rs. 2,501-5,000 and three farmers - more than Rs. 5,000) and 14 percent had spent less (majority - Rs. 2,500 or less).

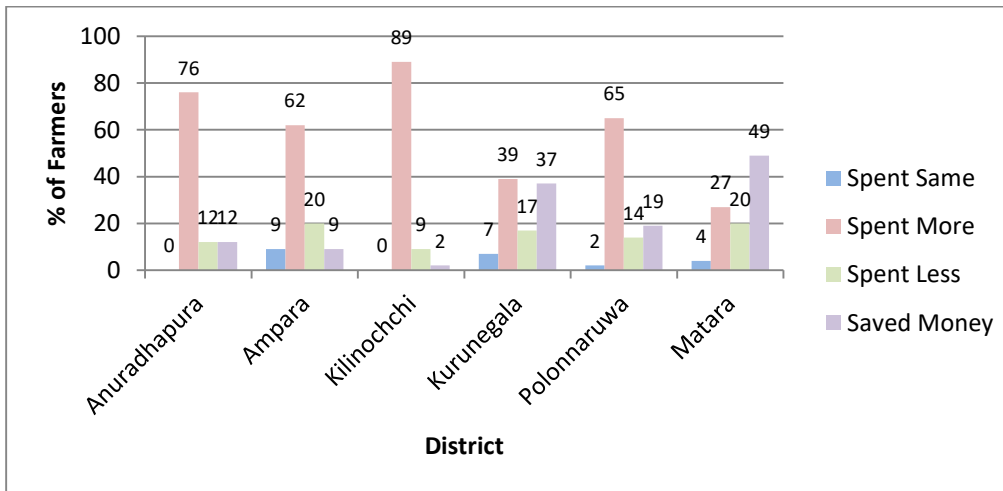
More farmers in Matara (49%) and Kurunegala (37%) were able to save money (majority in Matara - Rs. 2,500 or less, majority in Kurunegala - Rs. 2,501-5,000) while 39 percent in Kurunegala and 27 percent in Matara had spent more (58% in Kurunegala and 47% in Matara - spent Rs. 5,000 or less). At the same time, 20 percent in Matara and 17 percent in Kurunegala had spent less (Rs. 2,500 or less) compared to the previous programme (Figure 6.7 and Table 6.13).

² Number of farmers who saved money here includes two categories; farmers who have saved some amount of money from the cash grant and therefore have saved in total the balance from the grant and the money they spent during the fertilizer subsidy programme. The other category is farmers who have not spent on fertilizer with the cash grant and therefore, they have saved the money they spent during the fertilizer subsidy programme.



Source: Field Survey, 2017

Figure 6.6: Spending Pattern of Inorganic Fertilizer under Fertilizer Cash Grant – Paddy Farmers in the Sample



Source: Field Survey, 2017

Figure 6.7: Difference in Expenditure Pattern on Inorganic Fertilizer under Fertilizer Cash Grant Compared to Fertilizer Subsidy - Paddy Farmers in the Sample

Table 6.13: Changes in Cost of Inorganic Fertilizer under Fertilizer Subsidy (FS) and Fertilizer Cash Grant (FCG) - Paddy Farmers in the Sample

		Major			Minor		Rain-fed	Total
		Anu*	Amp*	Kil*	Kur*	Pol*	Mat*	
Expenditure under FS (Rs.) (%)	≤2,500	42	4	7	63	23	91	38
	2,501 – 5,000	31	76	11	27	35	7	31
	5,001 – 7,500	16	13	22	7	28	2	15
	7,501 – 10,000	9	2	36	-	2	-	8
	10,001 – 12,500	2	2	9	2	9	-	4
	12,501 – 15,000	-	-	7	-	-	-	1
	>15,000	-	2	9	-	2	-	2
	Total	45	45	45	41	43	45	264
Status under FCG# (%)	No expenditure	12	9	2	22	16	22	14
	Spent other than the grant	88	91	98	63	81	51	78
	Balance from the grant	-	-	-	15	2	27	8
	Total	25**	45	45	41	43	45	244
Details of Expenditure under FCG (Rs.) (%)	≤2,500	18	17	5	73	14	70	28
	2,501 – 5,000	14	22	2	15	31	22	17
	5,001 – 7,500	18	27	2	4	23	4	14
	7,501 – 10,000	23	10	9	8	6	-	9
	10,001 – 12,500	14	15	18	-	11	-	11
	12,501 – 15,000	9	5	20	-	6	4	8
	>15,000	5	5	43	-	9	-	13
	Total	22	41	44	26	35	23	191
Details of the Balance under FCG (Rs.) *	Saved ≤2,500	-	-	-	4	-	10	14
	Saved 2,501 – 5,000	-	-	-	1	1	2	4
	Saved 5,001 – 7,500	-	-	-	-	-	-	-
	Saved >7,500	-	-	-	1	-	-	1
	Total	0	0	0	6	1	12	19
Difference in Expenditure between FS and FCG (Rs.) (%)	No difference	-	10	-	12	3	9	5
	Spent more ≤2,500	23	20	5	46	43	30	26
	Spent more 2,501 – 5,000	50	24	30	12	17	17	25
	Spent more 5,001 – 7,500	9	10	18	4	6	-	9
	Spent more 7,501 – 10,000	-	10	9	-	9	4	6
	Spent more >10,000	5	5	30	-	6	-	9
	Spent less ≤2,500	14	22	7	27	11	39	18
	Spent less 2,501 – 5,000	-	-	-	-	3	-	1
	Spent less 5,001 – 7,500	-	-	2	-	3	-	1
	Total	22	41	44	26	35	23	191
Details of Savings Compared to FS *	Saved ≤2,500	2	-	-	-	4	15	21
	Saved 2,501 – 5,000	1	4	-	10	1	6	22
	Saved >5,000	-	-	1	5	3	1	10
	Total	3	4	1	15	8	22	53

Note: Anu* - Anuradhapura, Amp* - Ampara, Kil* - Kilinochchi, Kur* - Kurunegala, Pol* - Polonnaruwa, Mat* - Matara
In Kurunegala and Polonnaruwa, four and two farmers respectively have not responded as they have not applied fertilizers or have partly applied fertilizers after 2016 due to drought.

- Status under FCG (Rs.) denotes the actual expenditure after deducting the cash grant from the total cost.

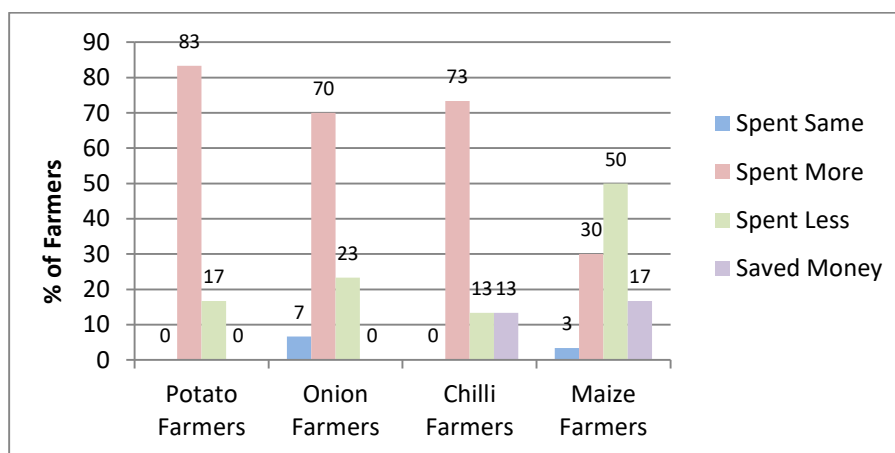
* - Count and not the percentage

** - only 25 farmers in Anuradhapura have cultivated only paddy in their paddy fields due to drought after 2016.

Source: Field Survey, 2017

A similar analysis was done with respect to the selected OFC and results are presented in Table 6.14. Half of the potato farmers and 57 percent of maize farmers had spent Rs. 2,501-7,500 for fertilizer under the previous programme while 63 percent of chilli farmers had spent Rs. 2,500 or less and 66 percent of onion farmers Rs. 5,000 or less. With the change in the programme in 2016, all the potato and onion farmers and 87 and 83 percent of chilli and maize farmers respectively had to spend more than the grant for fertilizer. Three and 10 percent of chilli and maize farmers respectively did not incur any expenditure while 10 and seven percent of chilli and maize farmers respectively were able to save money from the grant. Accordingly, three chilli farmers were able to save less than Rs.500 and two maize farmers had saved more than Rs.500 from the grant. In that context, 88, 64 and 60 percent of chilli, maize and onion farmers respectively have spent Rs. 7,500 or less on fertilizer after 2016 and 77 percent of potato farmers had spent more than Rs. 10,000 (Table 6.14).

Next, a comparison was made with respect to the cost they incurred on fertilizer before 2016 and after 2016 and results are shown in Figure 6.8. Results show that seven and three percent of onion and maize farmers respectively have spent the same amount on fertilizer during both programmes. However, the majority of potato (83%), chilli (73%) and onion (70%) farmers had to spend more on fertilizer with the change. Of the potato farmers, 47 percent had to spend Rs. 7,500 or less while, 37 percent had to spend Rs. 7,500 or more. Further, 63 and 85 percent of onion and chilli farmers had to spend Rs. 7,500 or less. Interestingly, half of maize farmers had spent less (majority Rs. 2,500 or less) while 17 percent had saved some money from the grant (more than Rs. 1,000) and only 30 percent had to spend more. Further, 13 percent of chilli farmers had spent less and another 13 percent have saved money after 2016.



Source: Field Survey, 2017

Figure 6.8: Difference in Expenditure Pattern on Inorganic Fertilizer under Fertilizer Cash Grant Compared to Fertilizer Subsidy - OFC Farmers in the Sample

Table 6.14: Changes in Cost of Inorganic Fertilizer under Fertilizer Subsidy and Fertilizer Cash Grant - OFC Farmers in the Sample

		OFC Farmers				
		Potato	Onion	Chilli	Maize	Total
Expenditure under FS (Rs.) (%)	≤2,500	10	23	63	10	27
	2,501 – 5,000	20	43	33	30	32
	5,001 – 7,500	30	20	3	27	20
	7,501 – 10,000	17	3	-	20	10
	10,001 – 12,500	7	3	-	7	4
	12,501 – 15,000	10	3	-	7	5
	>15,000	7	3	-	-	3
	Total	30	30	30	30	120
Status under FCG# (%)	No expenditure	-	-	3	10	3
	Spent other than the grant	100	100	87	83	92
	Balance from the grant	-	-	10	7	5
	Total	30	30	30	30	120
Details of Expenditure under FCG (Rs.) (%)	≤2,500	3	13	38	28	20
	2,501 – 5,000	7	37	15	20	20
	5,001 – 7,500	10	10	35	16	17
	7,501 – 10,000	3	13	8	4	7
	10,001 – 12,500	27	10	4	12	14
	12,501 – 15,000	7	7	-	4	5
	>15,000	43	10	-	16	18
	Total	30	30	26	25	111
Details of the Balance under FCG (Rs.) *	Saved ≤ 500	-	-	3	-	3
	Saved > 500	-	-	-	2	2
	Total	0	0	3	2	5
Difference in Expenditure between FS and FCG (Rs.) (%)	No difference	-	7	-	4	3
	Spent more ≤2,500	7	37	50	16	27
	Spent more 2,501 – 5,000	23	13	35	8	20
	Spent more 5,001 – 7,500	17	13	-	-	8
	Spent more 7,501 – 10,000	20	7	-	4	8
	Spent more >10,000	17	-	-	8	6
	Spent less ≤2,500	10	23	15	40	22
	Spent less 2,501 – 5,000	3	-	-	16	5
	Spent less > 5,000	3	-	-	4	2
Total	30	30	26	25	111	
Details of Savings Compared to FS *	Saved ≤500	-	-	1	-	1
	Saved 501 – 1,000	-	-	1	-	1
	Saved >1,000	-	-	2	5	7
	Total	0	0	4	5	9

Note: # - Status under FCG (Rs.) denotes the actual expenditure after deducting the cash grant from the total cost.

* - Count and not the percentage

Source: Field Survey, 2017

6.7 Changes in Logistic Management

Time of Receiving the Grant and Responses to the Delayed Grant

The majority of paddy farmers claimed of not receiving the grant when needed and all the farmers in Kilinochchi and Matara and 95 percent from Kurunegala were among them (Table 6.15). Later, the response of the farmers to the delayed grant was studied and it was revealed that the majority in all the districts except in Anuradhapura had applied for the required amount on time and some others applied for less amounts than required on time (Table 6.15). In Anuradhapura, only 56 percent had applied for the required amount on time and 38 percent had applied for lesser amounts on time. A few from Ampara (9%), Kilinochchi (7%) and Kurunegala (3%) stated that they were waiting for the grant to apply fertilizer (Table 6.15).

Similarly, all the onion and chilli farmers and the majority of potato (93%) and maize (97%) farmers also have not received the grant on time (Table 6.16). However, all the onion farmers, 97 percent of chilli and maize farmers and 79 percent of potato farmers have applied for the required amount of fertilizer on time. Of the potato farmers, 21 percent have applied for a lesser quantity of fertilizer than required, however, on time (Table 6.16). Therefore, there was not much negative effect on the cultivation of both paddy and OFC despite the grant being late.

Method of Purchasing Fertilizer

Since the majority have not received the grant on time and that too being inadequate farmers were asked on how they managed to buy fertilizer and these responses are presented in Table 6.15. Accordingly, most of the farmers in all the districts except Kilinochchi had used their own money to buy fertilizer while some others have borrowed money from an informal source, purchased on credit from fertilizer vendors without any interest, pawned their jewellery or obtained a bank loan to buy fertilizer. However, the farmers in Kilinochchi had shown a different pattern and the highest number of farmers had found money by pawning jewellery (40%) followed by purchases on credit from fertilizer vendors with an interest (33%), obtaining a loan from an informal source (24%) or a bank loan (24%). A few from Anuradhapura (2%), Ampara (5%) and Matara (7%) had found money by selling the paddy they stored for consumption (Table 6.15).

The following narratives also confirm the above mentioned responses.

'Fertilizer Cash Grant was not received on time. However, a majority of farmers were able to apply fertilizer on time using personal savings or loans. However, the rest were not able to find cash to purchase fertilizers'. (FGD with farmers, Panduwasnuwara ASC, Kurunegala District)

'Most of the time, the fertilizer subsidy was given to the farmers on time. However, because of the delay of the cash grant, the fertilizers cannot be purchased on time. However, we did not wait until the cash was deposited into our account. We had used our own money to purchase the fertilizers and had done the cultivation'. (FGD with farmers, Kilinochchi District)

'As a result of insufficient grant and delay, farmers are forced to take loans and ultimately ended up in poverty. Currently, farmers have experienced this situation'. (FGD with farmers, Dehiattakandiya ASC, Ampara District)

Similarly, the problem of finding cash to buy fertilizer for OFC for the same reasons of delay and insufficiency of the grant was also explored and the responses are presented in Table 6.16. A similar pattern was observed among onion and chilli farmers and the majority (80% onion and 77% chilli) had found money by pawning their jewellery followed by obtaining bank loans (47% onion and 57% chilli) and loans from informal sources (43% onion and 37% chilli). The similarity of methods could be due to the fact that both onion and chilli farmers were from the Jaffna district. Of potato farmers, the highest number (47%) had used their own money to buy fertilizer followed by finding money by pawning jewellery (30%), obtaining bank loans (23%) and purchased on credit from fertilizer vendors without any interest (23%). Of the maize farmers the highest number (48%) had obtained loans to buy fertilizer while, 38 percent had purchased on credit from fertilizer vendors with an interest and 21 percent had used their own money (Table 6.16). The following narrative also confirms the above mentioned results.

'FCG is not sufficient enough to purchase fertilizers and it was delayed. Farmers have obtained loans from banks, money lenders and also by pawning. Because of the low soil fertility all farmers use both organic and inorganic fertilizers'. (FGD with chilli farmers, Jaffna District)

Table 6.15: Time of Receiving the Fertilizer Cash Grant, Responses to the Delayed Grant and Methods of Finding Cash to Buy Fertilizer - Paddy Farmers in the Sample

		Major			Minor		Rain-fed	Total
		Anu*	Amp*	Kil*	Kur*	Pol*	Mat*	
Time of Receiving (%)	Yes, received on time	24	22	-	5	30	-	14
	No, not received on time	76	78	100	95	70	100	86
	Total	45	45	45	41	43	45	264
Response to the Delayed Grant (%)	The required amount of fertilizer was applied on time	56	66	89	79	70	66	71
	The required amount of fertilizer was applied later	-	-	-	-	-	2	<1
	Less amount of fertilizer than required was applied on time	38	26	2	15	27	24	21
	Less amount of fertilizer than required was applied later	-	-	-	3	3	7	2
	More amount of fertilizer than required was applied on time	6	-	-	-	-	-	1
	More amount of fertilizer than required was applied later	-	-	2	-	-	-	<1
	Was waiting for the grant	-	9	7	3	-	-	3
	Total	34	35	45	39	30	45	228
Method of Finding Cash to buy Fertilizer* (%)	Own money	67	67	22	67	72	77	61
	A loan from an informal source	21	21	24	18	26	19	21
	On credit from fertilizer vendors without any interest	7	7	13	18	7	9	10
	Pawning jewellery	16	5	40	3	-	2	11
	Bank loan	9	9	24	-	9	-	9
	On credit from fertilizer vendors with an interest	-	5	33	5	-	2	8
	Selling the paddy stored for consumption	2	5	-	-	-	7	2
	Land owner provided	-	-	-	5	-	-	1
	Used the balance fertilizer stored from the previous programme	2	-	-	-	-	-	<1
	Total	43	43	45	39	43	45	258

Note: Anu*- Anuradhapura, Amp* - Ampara, Kil* - Kilinochchi, Kur* - Kurunegala, Pol* - Polonnaruwa, Mat* - Matara

In Kurunegala and Polonnaruwa, four and two farmers respectively have not responded as they have not applied fertilizers or have partly applied fertilizers after 2016 due to drought.

* - Multiple Responses

Source: Field Survey, 2017

Table 6.16: Time of Receiving the Fertilizer Cash Grant, Responses to the Delayed Grant and Methods of Finding Cash to Buy Fertilizer - OFC Farmers in the Sample

		OFC Farmers				
		Potato	Onion	Chilli	Maize	Total
Time of Receiving (%)	Received on time	7	-	-	3	3
	Not received on time	93	100	100	97	97
	Total	30	30	30	30	120
Response to the Delayed Grant (%)	The required amount of fertilizer was applied on time	79	100	97	97	93
	Less amount of fertilizer than required was applied on time	21	-	3	3	7
	Total	28	30	30	29	117
Cash Source to Buy Fertilizer* (%)	Pawning jewellery	30	80	77	7	49
	Bank loan	23	47	57	48	44
	On credit from fertilizer vendors with an interest	3	37	23	38	25
	Own money	47	23	7	21	24
	A loan from an informal source	7	43	37	3	23
	On credit from fertilizer vendors without any interest	23	37	7	10	19
	A loan from Community Based Organisations	10	-	3	-	3
	Total	30	30	30	29	119

Note: * - Multiple Responses

Source: Field Survey, 2017

Time Spent on Meetings, Place of Purchasing Fertilizer and Distance to Purchasing Place

Data pertaining to this section was collected only from paddy farmers as there were not many changes faced by OFC farmers with regard to attending meetings and place of purchase after 2016. Fertilizer for OFC farmers were not distributed through ASCs as in the case of paddy and the farmers could purchase fertilizers at the open market at subsidised prices even before 2016.

One of the changes expected by the new programme is to reduce the time spent by farmers on attending meetings and on meeting officials to get the subsidy. However, just over half of the farmers in all the locations except Kilinochchi (only 38%) have not

experienced any difference in the time they spent (Table 6.17). Of the farmers who have experienced a saving in time, the majority in all the locations except in Polonnaruwa were able to reduce the time by two days or less. It was same in the case of Polonnaruwa for 59 percent of the farmers and the rest have saved more than two days (Table 6.17). A few (four each in Kurunegala and Matara, three in Kilinochchi and one each in Ampara and Polonnaruwa) stated that they had to increase the time they spent and the majority of them said it was two days or less (Table 6.17).

With regard to the place of purchasing, it was the place in the village decided by the respective Farmer Organisation for the majority of farmers in all the locations except in Kilinochchi during the fertilizer subsidy programme (Table 6.17). In Kilinochchi it was the ASCs. With the change in the programme, the majority in all the locations except in Matara had shifted to retail vendors in the village or nearby to buy fertilizer (Table 6.17). In Matara, 56 percent had visited retail traders while 51 percent co-operative societies in their villages. A few (11% in Kilinochchi, 7% in Ampara and 5% in Polonnaruwa) had visited the ASCs.

Another change envisaged in the programme was to see the possibilities of cutting down the distance to the place of purchasing fertilizer. However, only majority of farmers in Kilinochchi had experienced a decrease (82%) or no noticeable difference (13%) in the distance (Table 6.17). This could be due to the fact that only the majority of farmers in Kilinochchi had to visit the respective ASCs to buy fertilizers whereas in all the other locations the farmer organisations have arranged a place within the village. The majority of farmers in Kurunegala (86%) and Ampara (71%) have experienced an increase in the distance and just over half of them had to go more >1-5km to buy fertilizers after 2016. Distance has increased for nearly half of the farmers in Anuradhapura, Polonnaruwa and Matara also and in Anuradhapura it was more than five kilometres for 36 percent of them. For 55 percent of them in Polonnaruwa had to travel more >1-5km and it was one kilometre or less for 50 percent of them in Matara (Table 6.17).

Table 6.17: Changes in Logistic Management under Fertilizer Subsidy (FS) and Fertilizer Cash Grant (FCG) - Paddy Farmers in the Sample

		Major			Minor		Rain-fed	Total
		Anu*	Amp*	Kil*	Kur*	Pol*	Mat*	
Change in time used to attend meetings and meeting officials per season compared to FS (%)	No difference	54	56	38	51	58	57	52
	Spent more time	-	2	6	9	2	9	5
	Spent less time	47	42	55	40	40	33	43
	Total	45	45	45	41	43	44	263
Details of more time spent to attend meetings and meeting officials per season compared to FS**	One day or less	-	-	1	1	-	-	2
	More than one day to two days	-	1	1	3	1	4	10
	More than two days	-	-	1	-	-	-	1
	Total	0	1	3	4	1	4	13
Details of less time spent to attend meetings and meeting officials per season compared to FS (%)	One day or less	38	53	72	50	29	7	44
	More than one day to two days	38	21	24	50	29	60	35
	More than two days	24	26	4	-	41	33	20
	Total	21	19	25	16	17	15	113
Place of buying fertilizer during FS* (%)	Farmer's Organisations	78	100	9	90	100	87	77
	Agrarian Services Centres	24	-	91	10	-	22	25
	Retail Vendors	-	-	-	-	-	2	<1
	Total	45	45	45	41	43	45	264
Place of buying fertilizer during FCG* (%)	Retail Vendors	100	93	89	100	98	56	89
	Co-operative Societies	-	-	-	-	-	51	9
	Agrarian Services Centres	-	7	11	-	5	-	4
	Wholesale Vendors	-	2	-	-	-	2	1
	Total	45	45	45	41	43	45	264
Change in distance to the place of buying fertilizer compared to FS (%)	No difference	24	9	13	2	33	29	19
	Increased distance	49	71	4	86	42	48	49
	Decreased distance	27	20	82	12	25	23	32
	Total	45	45	45	41	43	45	264
Details of increased distance (%)	1km or less	18	37	50	14	28	50	29
	>1km to 3km	45	44	50	57	22	36	43
	>3km to 5km	-	13	-	20	33	4	14
	> 5km	36	6	-	9	17	9	14
	Total	22	32	2	35	18	22	131
Details of decreased distance**	1km or less	1	7	10	1	6	3	28
	>1km to 3km	4	-	13	1	4	1	23
	>3km to 5km	4	2	4	1	1	3	15
	> 5km	3	-	10	2	-	3	18
	Total	12	9	37	5	11	10	84

Note: Anu* - Anuradhapura, Amp* - Ampara, Kil* - Kilinochchi, Kur* - Kurunegala, Pol* - Polonnaruwa, Mat* - Matara
 In Kurunegala and Polonnaruwa, four and two farmers respectively have not responded as they have not applied fertilizers or have partly applied fertilizers after 2016 due to drought.
 Of the 45 farmers in Matara, one has not responded to the question regarding the time change in attending meetings and meeting officials since he does not attend for his son being the president of the Farmer Organisation.
 * - Multiple Responses
 ** - Count and not the percentage

Source: Field Survey, 2017

6.8 Changes in Usage and Cost of Organic Fertilizer

In general easily available paddy straw is the widely used organic matter in paddy fields in Sri Lanka. Confirming that the majority of farmers in all the study locations have used the paddy straw as organic fertilizer and it has not changed after 2016 (Table 6.18). In addition, other plant parts such as gliricidia (mainly in Ampara and Kurunegala) and animal manure (mainly in Kurunegala, Kilinochchi and Anuradhapura) were also in use. However, use of compost was not that notable in all the locations except for nine percent of farmers in Kilinochchi and seven percent each in Ampara and Kurunegala. With respect to the cost that farmers had to incur on organic fertilizers, all the farmers in Kilinochchi and Polonnaruwa and the majority in all the other locations incurred no expenditure (Table 6.18). Only a few, six percent in the entire sample, had to spend on organic fertilizer and majority of them were from Kurunegala costing them Rs. 2,500 or less.

In exploring the changes in usage of organic fertilizer, all the farmers in Kilinochchi stated that there was no significant change before and after the Fertilizer Cash Grant. Of the farmers in Anuradhapura, only six farmers (13%) have increased the quantity of organic fertilizer. Of them, one farmer did so due to the higher cost of inorganic fertilizer. Five farmers have increased the usage as they get the organic manure free from their cattle rearing ventures. In Ampara, only three farmers have increased the usage, one due to high cost of inorganic fertilizer and are supposed to have a risk of kidney diseases, one due to decreased soil fertility and one as they get the organic manure free from their cattle rearing projects. In Kurunegala, four farmers have increased the usage and a similar number have cut down the usage. Reasons to increase the usage were the high cost of inorganic fertilizer (1), improvement of soil fertility (1) and the awareness received at a programme conducted on importance of using organic manure (2). Farmers who have reduced the usage stated that there is no time to prepare (1), no place to buy (1) and the tendency to increase the weed population on the field with the usage of poultry manure (2) as the reasons to cut down the usage of organic manure. In Polonnaruwa, three farmers have increased (due to high cost of inorganic fertilizer – 1 and the awareness received about the advantages of organic fertilizer – 2) and one farmer has decreased the usage as there is no time to prepare organic manure. In Matara, one farmer has used compost as inorganic fertilizer application was delayed and another farmer has decreased the usage of plant parts as there was no time to do so.

Almost all the farmers in study locations (92%) except a few (8%) had borne no cost on organic fertilizer during both programmes. Therefore, only nine percent in Kurunegala, four percent in Ampara and two percent in Matara have experienced an increase in the cost and five percent in Kurunegala, four percent each in Anuradhapura and Ampara had experienced a decrease in cost (Table 6.18).

Table 6.18: Changes in Usage and Cost of Organic Fertilizer (OF) under Fertilizer Subsidy (FS) and Fertilizer Cash Grant (FCG) - Paddy Farmers in the Sample

		Major						Minor				Rain-fed		Total (N=264) %		
		Anu* (N=45) %		Amp* (N=45) %		Kil* (N=45) %		Kur* (N=41) %		Pol* (N=43) %		Mat* (N=45) %		FS	CG	
Type of organic fertilizer used*		FS	CG	FS	CG	FS	CG	FS	CG	FS	CG	FS	CG			FS
		Used paddy straw	91	91	98	98	98	98	83	83	98	98	98	98	94	94
		Used other plant parts	31	33	44	47	4	4	37	41	14	12	13	11	24	25
		Used animal manure	20	20	11	11	20	20	44	41	12	7	-	-	17	16
		Used compost	7	4	4	7	9	9	7	7	7	-	-	2	6	5
Status of OF usage under FCG compared to FS	No difference in used amounts	87		93		100		80		91		95		92		
	Usage was increased	13 (N=6)		7 (N=3)		-		10 (N=4)		7 (N=3)		2 (N=1)		6		
	Usage was decreased	-		-		-		10 (N=4)		2 (N=1)		2 (N=1)		2		
Cost of organic fertilizer used (Rs.)	No cost	93	98	93	94	100	100	76	73	100	100	100	98	94	94	
	≤2,500	7	2	2	4	-	-	24	24	-	-	-	2	5	5	
	2,501 – 5,000	-	-	2	2	-	-	-	-	-	-	-	-	<1	<1	
	5,001 – 7,500	-	-	2	-	-	-	-	2	-	-	-	-	<1	<1	
Status of cost of OF under FCG compared to FS	No cost in both programmes	94		89		100		68		100		98		92		
	No difference in the cost incurred	2 (N=1)		2 (N=1)		-		17 (N=7)		-		-		3 (N=9)		
	Cost got increased	-		4 (N=2)		-		9 (N=4)		-		2 (N=1)		3 (N=9)		
	Cost got decreased	4 (N=2)		4 (N=2)		-		5 (N=2)		-		-		1 (N=4)		

Note: Anu* - Anuradhapura, Amp* - Ampara, Kil* - Kilinochchi, Kur* - Kurunegala, Pol* - Polonnaruwa, Mat* - Matara

CG – Cash Grant

In Kurunegala and Polonnaruwa, four and two farmers respectively have not responded as they have not applied fertilizers or have partly applied fertilizers after 2016 due to drought.

* - Multiple Responses

Source: Field Survey, 2017

Unlike in paddy, a variation was noted among OFC farmers with respect to the usage of organic manure. The majority of maize farmers were not using organic manure in their cultivation (Table 6.19). Only two farmers had used compost during the fertilizer programme and they also discontinued it after 2016 for lack of time for them to prepare compost. All the onion and chilli farmers had used cow dung and apart from that 30 percent of chilli farmers had used plant manure and 17 percent of onion farmers had used compost. Of the potato farmers, most commonly used organic manure during the fertilizer programme was poultry manure (63%) followed by compost (27%). Interestingly, it changed after 2016 as compost (63%) being the most common followed by poultry manure (57%).

With respect to the change in usage of organic manure, only 37 percent of potato, 20 percent of onion and three percent of maize farmers had increased the usage after 2016 (Table 6.19). The reasons for the increase in the usage were availability of organic manure at the market, awareness received on the importance and preparation of organic manure, low quality of available inorganic fertilizer and decreased soil fertility. At the same time, two each of potato and maize farmers had cut down the usage as there was no time to prepare organic manure, difficulties in finding and high cost.

In exploring the cost incurred by the OFC farmers on organic fertilizer, almost all the onion farmers and 67 percent of chilli farmers had spent more than Rs. 10,000 on their plots (Table 6.19). The cost incurred by onion farmers ranged between Rs. 10,001 – 50,000 while it was Rs. 10,001 – 70,000 for chilli farmers. Of the potato farmers, the highest number during both programmes had spent Rs. 2,500 or less on organic manure (43% before 2016 and 50% after 2016). The study also finds that none of the maize farmers had spent on organic fertilizer. In that context, 80 percent of onion farmers, 37 percent each chilli and potato farmers had to pay more on organic manure after 2016. Of that category, the majority of onion and chilli farmers had to pay more than Rs. 10,000 extra to buy organic fertilizer.

Table 6.19: Changes in Usage and Cost of Organic Fertilizer (OF) under Fertilizer Subsidy (FS) and Fertilizer Cash Grant (FCG) - OFC Farmers in the Sample

		OFC Farmers									
		Potato (N=30) %		Onion (N=30) %		Chilli (N=30) %		Maize (N=30) %		Total (N=120) %	
		FS	CG	FS	CG	FS	CG	FS	CG	FS	CG
Type of organic fertilizer used*	Cow dung	23	20	100	100	100	100	-	3	56	56
	Poultry manure	63	57	-	-	7	7	-	-	18	16
	Compost	27	63	17	17	3	3	7	-	13	21
	Plant manure	7	7	10	10	30	30	13	17	15	16
	None	10	3	-	-	-	-	80	83	23	22
Status of OF usage under FCG compared to FS	Not used in both programmes	3 (N=1)		-		-		80 (N=24)		21 (N=25)	
	No difference in used amounts	53 (N=16)		80 (N=24)		100 (N=30)		10 (N=3)		61 (N=73)	
	Usage was increased	37 (N=11)		20 (N=6)		-		3 (N=1)		15 (N=18)	
	Usage was decreased	7 (N=2)		-		-		7 (N=2)		3 (N=4)	
Cost of organic fertilizer used (Rs.)	Not used any	10	3	-	-	-	-	80	83	23	22
	No cost	17	10	-	-	20	23	20	17	14	13
	≤2,500	43	50	-	-	3	7	-	-	12	14
	2,501 – 5,000	17	20	-	-	7	3	-	-	6	6
	5,001 – 7,500	10	7	-	-	3	-	-	-	3	2
	7,500-10,000	-	3	3	-	-	-	-	-	1	1
	>10,000	3	7	97	100	67	67	-	-	42	43
Status of cost of OF under FCG compared to FS	No cost in both programmes	13 (N=4)		-		20 (N=6)		100		33 (N=40)	
	No difference in the cost incurred	43 (N=13)		20 (N=6)		37 (N=11)		-		25 (N=30)	
	Cost got increased	37 (N=11)		80 (N=24)		37 (N=11)		-		38 (N=46)	
	Cost got decreased	7 (N=2)		-		7 (N=2)		-		3 (N=4)	

Note: CG – Cash Grant
* - Multiple Responses

Source: Field Survey, 2017

From the findings from previous studies and from the field observations, it was noted that there are many constraints faced by the farmers in using organic fertilizers and these difficulties were investigated and the results are presented in Table 6.20 and 6.21.

The majority of paddy and OFC farmers preferred to increase but there are difficulties in using organic fertilizer and the others said that they have no interest to change the present usage pattern of organic fertilizer.

Accordingly, the five main difficulties faced by paddy farmers were difficulty in finding (52%), lack of space, time or raw material to prepare (33%), requiring in large quantities (31%), need of more time to prepare (27%) and lack of knowledge on preparation/importance (17%). However, there were changes in the priority order among the districts as well. The reason, lack of knowledge on preparation/importance was prominent in Kilinochchi (51%) and Matara compared to other locations (Table 6.20).

Table 6.20: Difficulties in Using Organic Fertilizer - Paddy Farmers in the Sample

Difficulty	Major			Minor		Rain-fed	Total
	Anu*	Amp*	Kil*	Kur*	Pol*	Mat*	
Difficult to find	46	49	59	38	31	81	52
No space, time or raw material to prepare	57	36	10	38	44	16	33
Required in large quantities	22	28	87	17	31	2	31
Required more time to prepare	35	41	18	24	36	12	27
Lack of knowledge on preparation/importance	3	13	51	-	10	19	17
Expensive	3	3	13	14	5	5	7
Got used to inorganic fertilizer	11	3	3	3	8	7	6
Required more time to give results	3	5	8	7	3	2	4
Difficulties in transporting	3	3	3	14	-	2	4
Required more labour to prepare	3	-	-	3	8	-	2
Question on the quality	-	-	-	3	-	5	1
Tendency of increasing the weed population	-	-	-	3	-	-	<1
Total	37	39	39	29	39	43	226

Note: Anu* - Anuradhapura, Amp* - Ampara, Kil* - Kilinochchi, Kur* - Kurunegala, Pol* - Polonnaruwa, Mat* - Matara

Multiple Responses

Source: Field Survey, 2017

The following narratives also confirm the above mentioned results.

'Use of organic fertilizers has not increased. There is not much effect from organic fertilizers. A huge quantity of organic fertilizers is needed; thus, labour is highly needed. Farmers are also not aware of the advantages

and disadvantages of organic fertilizers’. (FGD with farmers, Medirigiriya ASC, Polonnaruwa District)

‘Non-availability of organic fertilizers is also a major problem. Thus, use of organic matter has not increased with the introduction of the Fertilizer Cash Grant Programme’. (FGD with farmers, Deniyaya ASC, Matara District)

‘Government should take necessary steps to implement and popularize the organic concept’. (FGD with farmers, Dehiattakandiya ASC, Ampara District)

The study finds that the main difficulties faced by OFC farmers were different from that of paddy farmers. However, the list of difficulties was largely similar in both types of farmers (Table 6.21). Of the potato farmers, the main difficulties were requiring in large quantities (38%) and lack of space, time or raw material to prepare (38%) followed by high cost (25%) and question on the quality (25%). The main difficulty faced by onion (96%) and chilli (75%) farmers were high cost followed by requiring in large quantities (24%) and lack of knowledge on preparation (24%) for onion farmers and it was difficult to find (42%) and required in large quantities (21%) for chilli farmers. Of the maize farmers, the main issue was space, time or raw material constraints to prepare (58%) followed by requiring in large quantities (42%) and difficulty in finding (35%).

Table 6.21: Difficulties in Using Organic Fertilizer - OFC Farmers in the Sample

Difficulty	OFC Farmers				
	Potato %	Onion %	Chilli %	Maize %	Total %
Expensive	25	96	75	-	51
Required in large quantities	38	24	21	42	31
Difficult to find	13	16	42	35	27
No space, time or raw material to prepare	38	-	-	58	23
Required more time to convert raw materials to compost	19	20	17	23	20
Lack of knowledge on preparation	13	24	4	15	14
Required more time to yield results	-	-	13	4	4
Question on the quality	25	-	-	-	4
Lack of knowledge on importance	6	-	-	4	2
Total	16	25	24	26	91

Multiple Responses

Source: Field Survey, 2017

6.9 Decision Making on the Fertilizer Usage

It was found that none of the farmers in the sample had conducted a soil test prior to applying the fertilizer to determine the required fertilizer types and quantities according to the soil fertility level and all of them have selected the types and quantities based on their past experiences. However, all agreed that conducting a soil test to determine the fertilizer requirement of their plots is a smart approach and all stated that they are willing to conduct soil tests if they are provided easy access for testing at an affordable rate.

6.10 Changes Experienced by the Implementers

Almost all the officials interviewed for the study stated that they are now able to complete their responsibilities with much ease and care and with high accuracy and transparency. In addition, they further stated that corruption is also less now unlikely the monetary frauds related to the Fertilizer Subsidy Programme. Further, they said that there was some difficulty in gathering the required details at the first stage and it was a bit difficult at the beginning. However, those issues have been resolved and it has become easier now. However, they also stated that since the new programme involves money, it entails more risks and therefore, it needs more responsibility. They were also of the view that gathering of the data manually has changed to an electronic system which is an additional advantage and said that approximately, 95 percent of the total paddy farmers in the country have been included in the system.

As officials at the District Office, the responsibilities of officials and time spent on the Fertilizer Cash Grant Programme have not changed compared to the fertilizer subsidy programme. However, DOs at the Agrarian Services Centres held the view that the cash grant scheme is more convenient for them as the work load has been reduced. According to them, they have spent 20-25 days per season during the previous system to complete the work. However, now they need only four to five days per season. Similarly, ARPAs also have spent nearly 20 days per season in the previous programme for the entire process. However, it has been reduced by 50 percent (i.e., 10 days per season) with the current programme.

Though the new programme is desirable, they also highlighted some issues related to the implementation of the Fertilizer Cash Grant Programme, which are listed below.

- i. Staff shortage – especially in Jaffna, Kilinochchi and Ampara districts. One of the major issues currently faced by the Ampara district is lack of ARPAs in the region. There are totally 29 ASCs in Ampara; and only 15 DOs. Some DOs are responsible for three centres. Hence, their workload is extremely

heavy. Also, there are 17 GN divisions where the officials have to work in Tamil medium, yet there are no ARPAs for those regions.

- ii. Limited infrastructure facilities to work with the database – for example, nine out of 56 Agrarian Services Centres do not have access to internet facilities in Kurunegala district. Technological facilities should be improved not only at the ASCs, but also at the Department of Agrarian Development and the Fertilizer Secretariat in each district.
- iii. Less technical knowledge and competencies among grassroots level staff members - some ARPAs and Development Officers have a lesser competency to work in English and their skills related to computers are also very poor.
- iv. Delay in circulating relevant Circulars and setting unrealistic targets
- v. Ambiguous Circulars - Contents in some Circulars are not clearly stated leading to confusion.

In addition, database is the foundation of the Fertilizer Cash Grant Programme. However, according to the officials there are limitations with the database even at present and are listed below.

- i. Not detecting the errors automatically when those occur at the time of uploading data.
- ii. There is no feedback on approved lists, rejected lists and justifications following uploading of the data
- iii. There is no mechanism to check whether farmers received the cash. After uploading, the DOs have no knowledge on the sequential steps. .
- iv. No proper coordinator at the national level to identify the system errors and address them.

Apart from the above mentioned limitations, the officials have observed the following changes in the institutional settings at the village level.

- i. Limited interaction between the Agrarian Services Centres and the farmers.
- ii. Limited revenue for Agrarian Services Centres - In the previous scheme, 90 percent of the revenue of the Agrarian Services Centres was generated from the fertilizers and the profit obtained was used for the maintenance of the ASC (e.g., repairs, labour wages, new construction etc.).
- iii. Limited interaction between Farmer Organisations and farmers - With the introduction of cash grant, the activities of the Farmer Organisations (e.g., *shramadana* campaign, water management, maintenance of tanks,) collapsed. Along with that, the community work such as irrigation work has been stagnant. On the other hand, Farmer Organisations have had a monopoly and abusing their power tried to control the farmers.

CHAPTER SEVEN

Perception towards the Fertilizer Subsidy Programmes

7.1 Introduction

Perceptions of both farmers and implementers with respect to the Fertilizer Cash Grant Programme and the Fertilizer Subsidy programme: 2005-2015 were studied and are presented in this chapter. The indicators used were farmers' perception on the quality of fertilizers provided, advantages and disadvantages of the two programmes and farmers' preference, implementers' perception and finally suggestions by both the farmers and the implementers to improve the current programme were also analysed. In addition, the main issues faced by the paddy farmers and OFC farmers in general were also collected and analysed at the end of this chapter with a view to proposing more practical recommendations.

7.2 Quality of Fertilizers

The ultimate objective of these input subsidy programmes is to provide fertilizers to farmers on time in right quantity. Another important aspect of these programmes is the quality of the inputs provided. Therefore, farmers' perception on the quality of fertilizers was also obtained and the results are presented in Table 7.1 and 7.2 and Figure 7.1.

It was found from the study that just over two thirds of farmers in Matara (67%), around three fifths in Anuradhapura (60%), Kilinochchi (60%) and Kurunegala (58%) and around half in Ampara (51%) and Polonnaruwa (53%) have not experienced any quality difference in the fertilizer provided by the two programmes (Table 7.1). Therefore, more than half of the farmers in all the districts have not experienced any quality difference. Of the farmers who felt a difference, the majority held the view that the fertilizer provided by the new FCG programme was of better quality (Table 7.1). The reasons provided to prove their argument were observance of the soil fertility for a longer period in terms of growth of the crop and the high quality of MOP, urea and mixtures.

Similar to paddy farmers, just over half of the OFC farmers (53%) also had the view that there was no difference in the quality of fertilizers provided during both programmes (Figure 7.1). At the same time, in the case of paddy, over half of the farmers in all the locations supported that view. However, of the OFC farmers, only chilli (60%) and maize (77%) farmers showed that pattern and 63 percent of potato and 60 percent of onion farmers were of the view that there was a difference in quality (Table 7.2). Of the

farmers who had felt the difference, more farmers except in the case of maize stated that the fertilizers provided before 2016 were better in quality than that provided after 2016. Further, the reasons given by OFC farmers were the observance of the soil fertility for a longer period, better growth of the crop and mixtures being better. A variety is available now but the quality is poor in certain fertilizers making crops more susceptible to pest and diseases (Table 7.2).

Table 7.1: Experience on the Quality of the Fertilizer - Paddy Farmers in the Sample

		Major			Minor		Rain-fed	Total (N=270) %
		Anu* (N=45) %	Amp* (N=45) %	Kil* (N=45) %	Kur* (N=45) %	Pol* (N=45) %	Mat* (N=45) %	
Perception	No difference in quality of fertilizer	60	51	60	58	53	67	58
	Higher quality in previous FS programme	20	22	7	11	15	11	14
	Higher quality in new FCG programme	20	27	33	31	31	22	27
Reasons to feel higher quality in previous FS programme * and **	MOP was much better	5	2	-	-	4	5	16
	Observed the soil fertility for a longer period	3	3	-	3	2	-	11
	Better growth of the crop	2	3	3	2	1	-	11
	Urea was much better	-	3	-	-	-	-	3
	Total	9	10	3	5	7	5	39
	Reasons to feel higher quality in new FCG programme * and **	Observed the soil fertility for a longer period	-	8	5	5	11	3
Urea was much better		-	3	4	6	2	6	21
Mixtures are better		1	2	7	4	-	-	14
Better growth of the crop		8	-	-	-	1	1	10
Total		9	12	15	14	14	10	74

Note: Anu* - Anuradhapura, Amp* - Ampara, Kil* - Kilinochchi, Kur* - Kurunegala, Pol* - Polonnaruwa, Mat* - Matara
 * - Multiple Responses
 ** - Count and not the percentage

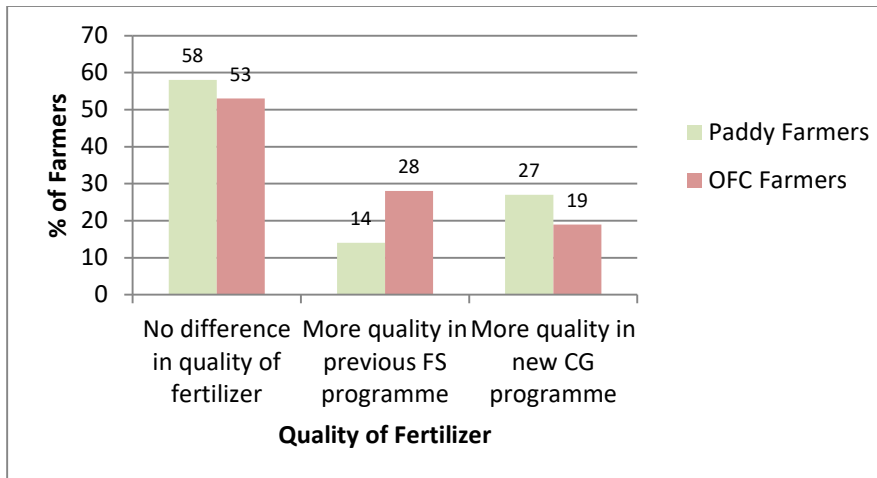
Source: Field Survey, 2017

Table 7.2: Experience on the Quality of the Fertilizer - OFC Farmers in the Sample

		OFC Farmers				
		Potato (N=30) %	Onion (N=30) %	Chilli (N=30) %	Maize (N=30) %	Total (N=120) %
Perception	No difference in quality of fertilizer	37	40	60	77	53
	More quality in previous FS programme	43	30	30	7	28
	More quality in new FCG programme	20	30	10	17	19
Reasons to feel more quality in previous FS programme*	A variety is available now, however, some are poor in quality. Therefore, quality was good previously	9	-	6	2	17
	Observed the soil fertility for a longer period	-	9	-	-	9
	Better growth/harvest of the crop	4	-	1	-	5
	Make crops more susceptible for pest and diseases now	-	-	2	-	2
	Total	13	9	9	2	33
Reasons to feel more quality in new FCG programme*	Observed the soil fertility for longer period	2	9	3	3	17
	Mixtures are better	3	-	-	2	5
	Better growth of the crop	1	-	-	-	1
	Total	6	9	3	5	23

Note: * - Count and not the percentage

Source: Field Survey, 2017



Source: Field Survey, 2017

Figure 7.1: Experience in the Quality of Fertilizer

7.3 Advantages and Disadvantages of the Programmes

Both advantages and disadvantages experienced by paddy farmers were studied with respect to both programmes and farmers were asked to name the three main advantages and disadvantages with respect to both programmes. Table 7.3 presents the advantages and disadvantages of the previous programme and Table 7.4 presents the advantages and disadvantages of the Fertilizer Cash Grant Programme. Since the OFC farmers had purchased fertilizers at the open market at a subsidised rate before 2016 but received the grant after 2016, they were requested to list down advantages and disadvantages only with respect to the Fertilizer Cash Grant Programme and the results are presented in Table 7.5.

With respect to the previous fertilizer subsidy programme, the main advantages highlighted by the farmers were the possibility of getting the entire amount of fertilizer at a lower price (36%), guarantee of applying the required quantity of fertilizer into the field (32%), receipt on time (31%) and receipt of the full required quantity of fertilizer (13%). However, farmers in Kilinochchi, Polonnaruwa and Matara have shown a different view and the following reasons; the real farmer gets the benefit (20% in Kilinochchi), farmers have time to get ready as the day of providing fertilizer was announced in advance (11% in Polonnaruwa) and low transportation cost (13% in Matara) topped the list of advantages. At the same time, 19 percent of farmers (18% in Anuradhapura, 9% in Ampara, 24% in Kilinochchi, 11% in Kurunegala, 16% in Polonnaruwa, and 33% in Matara) have stated that there were no special advantages of the previous programme. The following narratives also explain the advantages experienced by farmers.

'With the previous programme, sometimes, a few quantities of fertilizers retained with farmers and they were able to use it for chena and vegetable cultivation. Moreover, they were able to use it for paddy in the following season'. (FGD with farmers, Anuradhapura District)

'Purchasing fertilizers for other crops at a higher price has become an issue. During the Fertilizer Subsidy Programme, the quantities of fertilizers given were more than sufficient for paddy. Thus, the rest was used for other crops. Now, farmers have to spend a lot of money to purchase fertilizers for other crops'. (FGD with farmers, Anuradhapura District)

With regard to the disadvantages of the previous programme, over half of the sample (59%) responded that there were no disadvantages of the programme. Further, it was also observed that more farmers (80%) in Kurunegala were supporting that view (Table 7.3). The main disadvantages with respect to the previous programme highlighted by the farmers were more time/paper work/labour requirement (23%), delay in receiving (15%), poor quality fertilizer (7%) and over use of inorganic fertilizer (4%).

With respect to the Fertilizer Cash Grant Programme, 51 percent stated that there were no advantages while 15 percent stated that there were no disadvantages (Table 7.4). Of the advantages, the possibility of buying when needed from any convenient place (29%) and only the required amount (15%) and less time and labour requirement (14%) were prominent. However, in Anuradhapura, seven percent of farmers have said that quality was good over the advantage of the possibility of buying only the required amount (4%). Interestingly, nine percent of farmers in Matara stated that it was possible for them to save some money from the grant and therefore it was an advantage (Table 7.4). Of the disadvantages, delay in receiving the grant (45%), insufficiency of the grant to buy the required quantity (27%), more chances to misuse the cash grant and not buy fertilizer (20%), the field not getting the required quantity of fertilizer at the right time (14%), non-availability of fertilizer when required (11%) and absence of a mechanism to inform the farmer on money deposition (11%) topped the list (Table 7.4). Some narratives of the FGDs which also support these findings are presented below.

'There are advantages as fertilizer is available at any time with the retail vendors and there are less chances for fraud'. (FGD with farmers, Anuradhapura District)

'When the land owner gets the money, the tenant farmer might not receive it to purchase fertilizer. But, this situation never occurred during the fertilizer subsidy programme, as the land owner did not want to keep

the fertilizer with him. There should be a mechanism to transfer the cash directly to the cultivator'. (FGD with Farmers, Kurunegala District)

'Due to severe drought conditions, cultivation has not been carried out for the past two seasons. However, the Fertilizer Cash Grant was received, and the money was spent on fulfilling the farmers' daily needs. Another few farmers would use the cash grant on alcohol. The officers claim that the money received for the previous season should be used to purchase fertilizers in the coming season, if cultivation was not carried out in the previous season. But, it is a hassle for the farmers, as the cash grant is already spent. If fertilizers were given, it could have been used in the coming season, because it would have remained'. (FGD with farmers, Medirigiriya ASC, Polonnaruwa District)

'The required amount of fertilizer cannot be purchased from the Fertilizer Cash Grant. Despite the recommended rate, farmers used to apply more fertilizers, especially, TSP even during the fertilizer subsidy programme. Therefore, with the introduction of the cash grant programme, fertilizer rates applied to paddy fields have reduced. However, farmers are able to purchase good quality fertilizers compared to those received during the fertilizer subsidy programme'. (FGD with farmers, Panduwasnuwara ASC, Kurunegala District)

'Farmers faced fertilizer shortage during this year for the first time; there aren't sufficient fertilizer quantities at shops. Sometimes, farmers have to wait for around 15-20 days to get fertilizers'. (FGD with farmers, Kilinochchi District)

'At the same time, fertilizer was not available at the market when needed and not available at the retail shop throughout because the vendor is not willing to keep more fertilizer stored. In addition, when buying less quantities of fertilizers at the retail shop, the farmers have to pay Rs.5.00 or more for each kilogramme, whereas the price increase per kilogramme is only Rs.2.00 when buying small quantities at the co-operative shops'. (FGD with farmers, Deniyaya ASC, Matara District)

'Responsibilities of the Farmer Organisations have reduced with the introduction of the Fertilizer Cash Grant Programme. However, Farmer Organisations had been influential during the fertilizer subsidy programme; thus, with their influence, maintenance of irrigation systems was carried out at least twice a season. If a farmer could not attend the

community work he was charged by the Farmer Organisation on the day he would come to collect his share of fertilizers. With the introduction of the Fertilizer Cash Grant Programme, farmers engage in these activities only the day on which kanna meetings would be held'. (FGD with farmers, Panduwasnuwara ASC, Kurunegala District)

'The cash grant is not sufficient to purchase the required amount of fertilizer. At the same time, the cash grant is not received on time. Thus, farmers buy on credit, and have to pay vendors Rs.3000/= per bag (cost and the interest). Prior to the Fertilizer Cash Grant Programme, fertilizers were purchased from the retail shops or ASC at Siyambalanduwa at a cost of Rs.1200/= per bag. Once the Fertilizer Cash Grant Programme was introduced, fertilizers were purchased from retail shops for Rs.2500/= per bag. The price of a bag is lower in the ASC (i.e., Rs.2000/=); yet, the farmers cannot get fertilizers on credit from the ASCs'. (FGD with maize farmers, Moneragala District)

'The Fertilizer Cash Grant is given only for five crops namely chilli, onion, potato, soya, and maize. Yet, there are farmers who cultivate OFCs other than those mentioned above in Yala season. For example, some farmers cultivate groundnut prominently. However, the cash grant is not given for such field crops. Thus, the government should provide the cash grant for additional OFCs'. (FGD with farmers, Kilinochchi District)

'Before 2016, fertilizer price was Rs.1,200 per 50kg bag in the open market. With the FCG programme the price has increased to Rs.2500 per 50kg bag. But this year the price has reached Rs.3300 per 50kg bag as a result of the fertilizer shortage'. (FGD with Chilli farmers, Jaffna District)

Table 7.3: Advantages and Disadvantages of the Fertilizer Subsidy Programme – Paddy Farmers in the Sample

Reason		Major			Minor		Rain-fed	Total (N=270) %
		Anu* (N=45) %	Amp* (N=45) %	Kil* (N=45) %	Kur* (N=45) %	Pol* (N=45) %	Mat* (N=45) %	
Advantages*	Can get the entire amount of fertilizer at a lower price	62	47	16	29	38	22	36
	Guarantee of applying the required amount of fertilizer into the field	20	31	27	40	64	9	32
	Received on time	29	27	20	42	27	44	31
	Received the required amount of fertilizer totally	16	40	20	-	4	-	13
	It was easy to get prepared as the day of providing fertilizer was announced in advance	2	7	11	9	11	4	7
	Received the entire amount of fertilizer at once	7	4	-	9	7	2	5
	Low transportation cost	7	7	-	-	2	13	5
	Real farmer gets the benefit	2	-	20	-	2	-	4
	More rapport with the Agrarian Services Centre	-	-	13	-	-	-	2
	Quality was good	2	2	-	2	4	-	2
	Small quantities also received without any difficulty	2	2	2	-	-	2	1
	All the farmers in the area did cultivation simultaneously	2	-	-	2	-	-	1
	More rapport with the Farmer Organisation	-	2	-	2	-	2	1
	Could save some amount of fertilizer to be used on other crops	4	-	-	-	-	-	1
	No advantages at all	18	9	24	11	16	33	19
Disadvantages*	More time/paper work/labour requirement	36	4	42	9	27	20	23
	Delay in receiving	11	7	49	9	7	7	15
	Poor quality fertilizer	7	9	-	9	7	11	7
	Over use of inorganic fertilizer	4	-	-	11	4	4	4
	No space to store at home	-	2	-	-	4	4	2
	Need own money to buy even though prices were low	-	-	-	4	-	-	1
	More corruption in the distribution channel	-	-	-	-	4	-	1
	No disadvantages	53	80	42	64	58	53	59

Note: Anu*- Anuradhapura, Amp* - Ampara, Kil* - Kilinochchi, Kur* - Kurunegala, Pol* - Polonnaruwa, Mat* - Matara
* - Multiple Responses

Source: Field Survey, 2017

Table 7.4: Advantages and Disadvantages of the Fertilizer Cash Grant Programme - Paddy Farmers in the Sample

Reason		Major			Minor		Rain-fed	Total (N=270) %
		Anu* (N=45) %	Amp* (N=45) %	Kil* (N=45) %	Kur* (N=45) %	Pol* (N=45) %	Mat* (N=45) %	
Advantages*	Can buy when needed from any convenient place	38	22	9	20	47	40	29
	Can buy only the required amount	4	7	22	16	27	13	15
	Less time and labour requirement	29	2	11	13	16	13	14
	Quality was good	7	2	-	4	2	2	3
	Grant was sufficient to buy the entire requirement/can save some money	-	-	-	2	-	9	2
	Can buy any good quality brand as per the choice	-	2	-	-	2	-	1
	Less chances for the office-bearers of Farmer Organisations to misuse fertilizer	2	-	-	-	-	-	<1
	Less responsibilities and duties for Farmer Organisations	-	-	-	-	2	-	<1
	No advantages at all	44	69	62	58	36	36	51
Disadvantages*	Delay in receiving	33	33	51	51	29	73	45
	Grant was not sufficient to buy the required amount of fertilizer	47	47	11	13	33	13	27
	More chances to misuse the cash grant and not buying fertilizer	22	9	38	24	18	7	20
	Field is not getting the required amount of fertilizer at the right time	7	24	16	13	20	2	14
	Fertilizer were not available when required	9	13	24	2	7	9	11
	No system to inform the farmer on money depositing	18	11	-	27	9	2	11
	Real farmer does not get the benefit	2	2	7	-	-	-	2
	More time consuming at banks	2	11	-	9	-	4	4
	More transportation cost	4	9	-	7	4	-	4
	Difficulties in buying small quantities	2	-	7	2	-	9	3
	Had to buy fertilizer for other cultivation for a higher price	2	-	-	-	-	-	0
	More chances of abandoning paddy cultivation	2	-	-	-	-	2	1
	Fertilizer poor in quality	2	-	-	2	-	-	1
	Less rapport with the Farmer Organisation	-	2	-	7	2	2	2
No disadvantages	16	11	11	13	22	16	15	

Note: Anu* - Anuradhapura, Amp* - Ampara, Kil* - Kilinochchi, Kur* - Kurunegala, Pol* - Polonnaruwa, Mat* - Matara
* - Multiple Responses

Source: Field Survey, 2017

In analysing the views of OFC farmers, the majority of potato farmers (77%) stated that there were no advantages they felt with the introduction of the Fertilizer Cash Grant Programme. However, 70 percent of onion, 60 percent of maize and 47 percent of chilli farmers stated that receipt of the grant was an advantage though it was small in amount (Table 7.5). In addition, 40, 27 and 17 percent of chilli, onion and potato farmers respectively held the view that they can buy fertilizers when needed in required amounts at their choice with the new programme and it was an advantage. Another 33 percent of chilli farmers said that they can use the grant to buy even other inputs and they perceived it as an advantage (Table 7.5).

With respect to disadvantages, 87 percent of potato farmers stated that the programme after 2016 was discouraging them from cultivating potato and the main issue faced by them was the unbearable price increase in the fertilizer market resulting in high cost of cultivation. At the same time, insufficient grant (43%) was also another disadvantage mentioned by them (Table 7.5). confirming that as mentioned in Chapter Six, 83 percent of potato farmers had to spend more on fertilizer (Figure 6.8) after 2016. Similarly, 47 percent of maize farmers cited unbearable price increase in fertilizer market (27%) and delay in providing the grant (17%) as disadvantages. However, the majority of chilli (87%) and onion (83%) farmers held the view that there were no specific disadvantages of the programme except the delay in providing the grant (17% onion and 10% chilli farmers) despite the fact that 73 and 70 percent of chilli and onion farmers had to spend more on fertilizer after 2016 (Figure 6.8).

Table 7.5: Advantages and Disadvantages of the Fertilizer Cash Grant Programme - OFC Farmers in the Sample

		OFC Farmers				
		Potato (N=30) %	Onion (N=30) %	Chilli (N=30) %	Maize (N=30) %	Total (N=120) %
Advantages*	Receipt of grant despite the amount being small	13	70	47	60	48
	Can buy when needed from any convenient place, only the required amount	17	27	40	10	23
	Can use the grant even to buy other inputs when necessary	-	13	33	-	12
	Better quality fertilizer	-	-	-	3	1
	No advantages at all	77	7	7	33	31
Disadvantages*	Unbearable price increase in fertilizer market resulting in high cost of cultivation	73	3	3	27	27
	Insufficient grant	43	3	-	3	13
	Delay in providing the grant	10	17	10	17	13
	Grant provided only for five selected OFCs	10	-	-	-	3
	Poor quality fertilizer	-	-	-	3	1
	No disadvantages	13	83	87	53	59

Note: * - Multiple Responses

Source: Field Survey, 2017

7.4 The Most Preferred Programme

As discussed in previous chapters, paddy farmers had experienced the fertilizer subsidy programme before and after 2016. However, OFC farmers were included as direct beneficiaries in the programme only after 2016. Therefore, the most preferred programme by farmers was investigated and only paddy farmers were included in this as OFC farmers were not direct beneficiaries before 2016.

The results show that 48 percent in the entire sample prefer the previous programme and 38 percent prefer the Fertilizer Cash Grant Programme while, 14 percent (especially in Matara and Kilinochchi) were not happy with both programmes and they suggested introduction of a new method (Table 7.6). This pattern was observed in all the locations except in Polonnaruwa and Matara (Table 7.6). Of the farmers in Polonnaruwa, 51 percent prefer the Fertilizer Cash Grant, while 44 percent prefer the previous programme and four percent a new method. Similar to the farmers in Polonnaruwa,

most farmers in Matara prefer the Fertilizer Cash Grant Programme (51%) in contrast to those who prefer the previous programme (22%). In addition, the second highest number of farmers (27%) prefer a new method in distributing the subsidy in Matara and in all the other five districts the new method was placed as the third. The following narrative too supports that argument in Matara district.

'Most farmers prefer the Fertilizer Cash Grant system if cash is received on time. The cash grant is sufficient for most of the farmers to purchase the quantities of fertilizers that were purchased during the fertilizer subsidy and the fertilizer is almost obtained free in the Fertilizer Cash Grant Programme. Quality of fertilizers is much higher than those used during the fertilizer subsidy programme. However, cash was not received on time. When the cash grant is delayed, farmers use their current earnings (especially, from tea), or would sell some bags of paddy, which were intended to be used for consumption, and use those earnings to purchase fertilizers'. (FGD with farmers, Deniyaya ASC, Matara District)

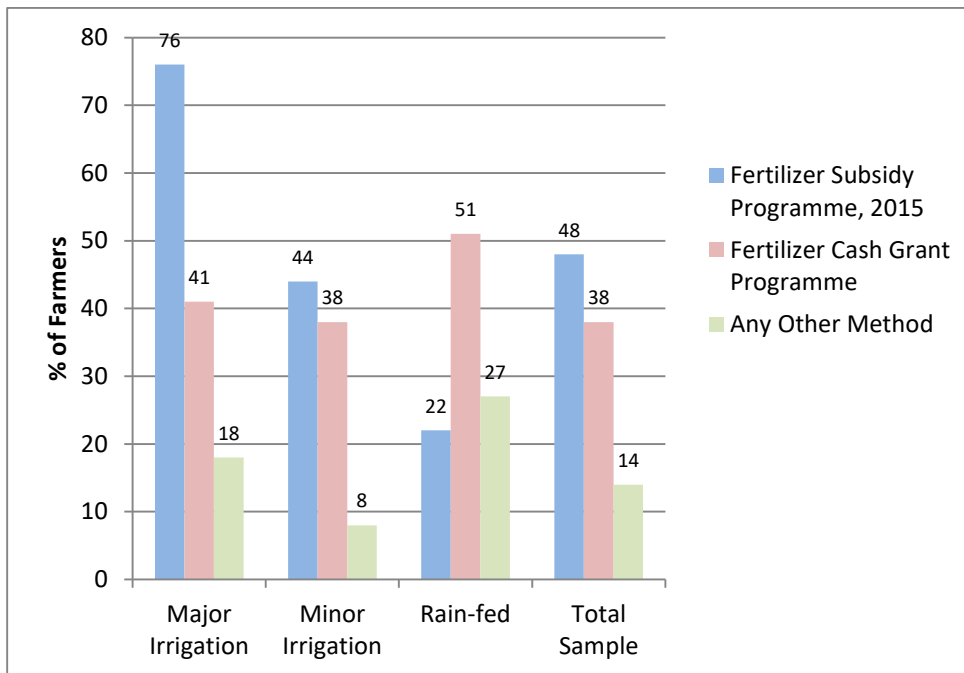
On the other hand it was also found from the study that significant preference towards the previous programme was observed with respect to the farmers cultivating under major irrigation schemes (Figure 7.2).

The main four reasons for the preference of the previous programme were its low cost and convenience in getting fertilizer to the field (32%), receipt of the full required quantity of fertilizer (31%), receipt of fertilizer on time (25%) and guarantee of applying fertilizer into the field and less chances of misusing the money (19%). However, there were differences in responses among the districts (Table 7.6). Farmers in Kilinochchi have shown a different view as they prefer the previous programme mainly because of the guarantee of applying fertilizer into the field (35%), being low cost and convenience of getting fertilizer to the field (35%), receipt of the benefit to the deserving farmer (25%) and receipt of the full required quantity of fertilizer (15%).

The main four reasons for the preference of the Fertilizer Cash Grant were the possibility to buy when needed and in required quantity (31%) and from any convenient place (23%), less time consumption and ease (20%) and the possibility to buy any good quality brand as per the choice (9%). However, there were differences in responses among districts (Table 7.6). Farmers in Kilinochchi had a different view than those in other districts and the order of reasons in Kilinochchi was as follows: delay was more in the previous programme compared to the Fertilizer Cash Grant, though the cash grant was also delayed (53%), the possibility of buying when needed from any convenient place (27%), when needed and in needed quantity (20%) and less time consumption and ease (13%). In addition, 13 and nine percent of them in Kurunegala and Matara

respectively have stated that cash grant was sufficient to buy the entire fertilizer requirement or needed only a little more money and therefore, they prefer the Fertilizer Cash Grant Programme. Confirming that 37 and 49 percent of farmers in Kurunegala and Matara had been able to save money from the grant and only 39 and 27 percent in Kurunegala and Matara had to spend more on fertilizer (Figure 6.7).

As stated earlier, a considerable number of farmers preferred a new method. Of them seven in Kilinochchi, five in Matara, four in Kurunegala, three each in Anuradhapura and Ampara and two in Polonnaruwa prefer any other method that can provide good quality fertilizer on time. Two farmers each from Kilinochchi, Kurunegala and Matara and one farmer from Anuradhapura claimed that what they needed is not a subsidy programme, but a reduction in the fertilizer prices at the open market. Five farmers from Matara, one each from Anuradhapura and Kilinochchi prefer a voucher/coupon system to distribute the subsidy.



Source: Field Survey, 2017

Figure 7.2: The Most Preferred Programme - Paddy Farmers in the Sample

Table 7.6: The Most Preferred Programme - Paddy Farmers in the Sample

		Major			Minor		Rain-fed	Total (N=270) %
		Anu* (N=45) %	Amp* (N=45) %	Kil* (N=45) %	Kur* (N=45) %	Pol* (N=45) %	Mat* (N=45) %	
Preference	Fertilizer Subsidy Programme, 2015	58	67	44	53	44	22	48
	Fertilizer Cash Grant Programme	31	27	33	33	51	51	38
	Any other method	11	7	22	13	4	27	14
Reasons to prefer FS Programme*	Cheap and easier in getting to the field	46	40	35	13	25	20	32
	Received the full required amount of fertilizer	54	43	15	17	30	-	31
	Received fertilizer on time	15	13	-	58	30	50	25
	Guarantee of applying fertilizer into the field	15	23	35	8	15	20	19
	Less time consuming	8	3	-	13	5	10	6
	Deserving farmer gets the benefit	-	-	25	-	-	-	4
	Less transportation cost	12	3	-	-	5	-	4
	Received the entire amount of fertilizer at once	4	-	-	-	-	-	1
	Difficulties in bank transactions	-	3	-	-	-	-	1
	There was a balance of fertilizer and it was used on other crops	-	-	-	4	-	-	1
	Good quality fertilizer	-	-	-	-	5	-	1
	Total		26	30	20	24	20	10
Reasons to prefer FCG Programme*	Can buy when needed and in required quantity	29	25	20	33	39	35	31
	Can buy when needed from any convenient place	36	17	27	27	9	26	23
	Less time consuming and easy	14	8	13	20	30	22	20
	Can buy any good quality brand as per the choice	-	42	-	7	13	-	9
	Delay was more on the previous programme compared to the cash grant though the cash grant was also delayed	-	-	53	-	-	-	8
	Can prevent over use of inorganic fertilizer	7	8	-	-	13	-	5
	Grant was sufficient to buy the entire fertilizer requirement/needed only little money	-	-	-	13	4	9	5
	Can have fertilizer mixtures as preferred	7	8	-	-	4	4	4
	Can save some money from the grant	-	-	-	-	-	9	2
	Can save money by using organic fertilizer	-	8	-	-	-	-	1
	Not responded	7	-	-	-	-	-	1
	Total		14	12	15	15	23	23

Note: Anu*- Anuradhapura, Amp* - Ampara, Kil* - Kilinochchi, Kur* - Kurunegala, Pol* - Polonnaruwa, Mat* - Matara
* - Multiple Responses

Source: Field Survey, 2017

7.5 Suggestions by Farmers for Further Improvement

As for suggestions to improve the new programme the farmers came up with a list which is presented in Table 7.7 and 7.8. The main suggestions provided by the paddy farmers were the need to get the grant on time and make the grant sufficient enough to buy the required amount of fertilizer. The following narratives too offered suggestions.

'Fertilizer Cash Grant is not received on time, necessitating them to take loans in order to purchase fertilizers. When the cash grant is received, farmers have to settle the loan as well as the interest using that money'. (FGD with farmers, Anuradhapura District)

'Fertilizer Cash Grant is not sufficient to purchase the total requirement of fertilizers. Thus, use of MOP and TSP has reduced. Those who applied the correct proportions owe the fertilizer vendors'. (FGD with farmers, Anuradhapura District)

'Authorities do not heed the farmers. They always neglect farmer's condition and make their own propaganda. Farmers are helpless in this situation'. (FGD with farmers, Dehiattakandiya ASC, Ampara District)

Agreeing with paddy farmers, the main suggestions provided by OFC farmers were also the provision of the grant on time and make the grant sufficient enough to buy the required amount of fertilizer. Further, a higher number of potato farmers were of the view of increasing the amount of the grant rather than providing the grant on time. In addition, the other suggestions recommended by OFC farmers are given in Table 7.8 and the following narratives.

'The government should check the fertilizers that are available in the market specially at times when fertilizers are in high demand as there are fertilizers of which date of use is expired. And organic fertilizers should be promoted using a model farm'. (FGD with maize farmers, Moneragala District)

'The Fertilizer Cash Grant is not sufficient to purchase the required amount of fertilizers and the grant is not received on time. Thus, farmers tend to pawn jewellery or to obtain loans to find money to purchase fertilizers. Prices of mixed fertilizers that are targeted for potato are higher (e.g., Rs.3,250.00/kg to Rs.3,750.00/kg) than those non-mixed fertilizers. And farmers do not know the specific fertilizer

recommendation for potato and mixing ratios. Thus, farmers tend to buy mixed fertilizers'. (FGD with potato farmers, Badulla District)

'We receive only Rs.4,000 per acre for fertilizer and this is not sufficient. And we didn't receive cash on time. There was a fertilizer shortage this December as well. Farmers obtained credit to purchase fertilizers. We did receive cash after applying fertilizer to the cultivation. Some farmers even obtained loans by pawning their valuables, obtain loans from banks and from informal sources and reduce cultivation extent'. (FGD with onion farmers, Jaffna District)

'Farmers do not have any place to raise their issues related to potato farming. Fertilizer Cash Grant is not received for vegetables such as cabbage and beans that are prominently grown in this region. Therefore, the cash granted should differ for each crop based on their fertilizer requirement. Also, the Fertilizer Cash Grant should be provided based on the prominent crops in each region. For example, for Badulla area, the cash grant should be provided for vegetable too'. (FGD with potato farmers, Badulla District)

Table 7.7: Suggestions for Further Improvement of the Fertilizer Cash Grant Programme – Paddy Farmers in the Sample

Suggestion	Major			Minor		Rain-fed	Total (N=270) %
	Anu* (N=45) %	Amp* (N=45) %	Kil* (N=45) %	Kur* (N=45) %	Pol* (N=45) %	Mat* (N=45) %	
Provide on time	27	22	27	53	36	78	40
Increase the amount of the grant	62	42	22	29	42	7	34
Reduce the price of fertilizer in the open market	27	36	20	7	16	11	19
Change the programme to the previous	7	11	36	4	13	2	11
Inform the farmer on money depositing	-	2	7	20	9	16	8
Make the deserving farmer get the benefit	-	-	16	2	2	-	3
Make the grant available at the Farmer Banks	2	9	-	2	9	-	3
Check the quality of fertilizer in the market regularly	2	-	2	-	2	-	1
Provide the grant for vegetables and OFCs	4	-	-	-	-	-	1
Make facilities for soil testing	2	-	-	-	2	-	1
Increase the availability of fertilizer in the open market	2	-	-	-	-	4	1
Make aware the farmer on recommendations	2	-	2	-	2	-	1
Motivate farmer to use more organic fertilizer	-	7	-	2	-	-	1
Provide a subsidy for cultivation and not specifically for fertilizer	-	2	-	2	-	-	1
Change the programme to a coupon system	-	-	2	4	2	-	1
Make smaller size of fertilizer bags (<50kg) available in the market	-	-	-	-	-	4	1
Not responded	4	4	11	13	11	9	8

Note: Anu*- Anuradhapura, Amp* - Ampara, Kil* - Kilinochchi, Kur* - Kurunegala, Pol* - Polonnaruwa, Mat* - Matara

Multiple Responses

Source: Field Survey, 2017

Table 7.8: Suggestions for Further Improvement of the Fertilizer Cash Grant Programme – OFC Farmers in the Sample

Suggestion	OFC Farmers				
	Potato (N=30) %	Onion (N=30) %	Chilli (N=30) %	Maize (N=30) %	Total (N=120) %
Provide on time	40	80	77	53	63
Increase the amount of the grant	70	47	47	33	49
Reduce the price of fertilizer in the open market	20	-	-	20	10
Provide the grant for vegetables and OFCs	17	17	-	3	9
Increase the upper ceiling of the extent eligible for the grant	-	13	-	10	6
Make the farmer aware of recommendations	7	-	-	3	3
Change the programme to the previous	7	-	-	-	2
Make facilities for soil testing	3	-	-	-	1
Increase the availability of fertilizer in the open market	-	-	-	3	1
Provide the grant for cultivations on encroached lands too	-	-	-	3	1
Not responded	-	-	23	3	7

Multiple Responses

Source: Field Survey, 2017

7.6 Issues Faced by Farmers in Cultivations

Of the farmers who cultivated under major irrigation schemes, the majority (66%) stated that non-availability of water sufficiently at the time required was the main issue for paddy cultivation and 80 percent of them identified it as their foremost issue. Further, it was the main issue for the majority of farmers in all three locations (Table 7.9).

Of Anuradhapura farmers, other main issues were crop damages by animals such as peacocks, wild elephants, monkeys, wild boars (53%), issues related to weedicides such as the dearth, low quality and the high cost of weedicides (24%) and issues related to seed paddy such as non-availability and low quality (22%). In the case of inorganic fertilizer, delay in getting the grant, insufficient grant and non availability of fertilizer in the market when required had been placed at the eighth place and it was mentioned by only seven percent of farmers.

Of Ampara farmers, other main issues relate to weedicides (32%), crop damages by animals (30%), seed paddy (23%) and issues related to paddy marketing such as absence of a reasonable price/stable price and high level of involvement of intermediaries (20%).

Similar to farmers in Anuradhapura, issues related to inorganic fertilizer had been placed at the eighth place in the list of issues and it was mentioned by 11 percent of farmers. Further, it was the main issue for 40 percent of them and another 40 percent identified it as the second main issue (Table 7.9).

In contrast, the Kilinochchi farmers came up with problems quite different from those confronted by their counterparts in Anuradhapura and Ampara. The issues related to paddy marketing (48%) had been considered by the farmers as the most prominent issue with water scarcity troubling them next (Table 7.9). The third main issue faced by Kilinochchi farmers related to inorganic fertilizer (33%) and 22 percent of them stated it as their first main issue while it was the second main issue for 56 percent and third main issue for another 22 percent. Other main issues of Kilinochchi farmers related to high cost and dearth of labour (30%), issues related to weedicides (19%) and pest and disease attacks (19%).

As explained by the farmers under major irrigation schemes, the main issue faced by the farmers (86%) in minor irrigation schemes also is the non-availability of adequate water at the time required (Table 7.10). Of the Kurunegala farmers, other major problems related to seed paddy (47%), labour (13%) and pest and disease attacks (13%). Only seven percent of farmers have come out with issues related to inorganic fertilizers among the first three issues and all of them listed it at the second place. Of the Polonnaruwa farmers, other issues were crop damages by animals (51%), issues related to weedicides (24%), seed paddy (22%) and irrigation systems such as poor maintenance of irrigation canals and poor water management (20%). Issues related to inorganic fertilizers were identified by none of the farmers in Polonnaruwa as their first three issues (Table 7.10).

In contrast to the views of farmers under major and minor irrigation schemes, the main issue of the farmers under rain-fed cultivation was the crop damages by animals (50%). It was the major problem for 35 percent of farmers (Table 7.11). Other main issues were labour issues (28%), issues related to weedicides (25%), natural disasters (23%), water scarcity (23%) and problems associated with inorganic fertilizers (23%). Issues related to inorganic fertilizers were rated number one by 33 percent of farmers. On the other hand, for rain-fed farmers, this was the fourth place in the list (Table 7.11).

Table 7.9: Main Issues Faced by the Sample of Paddy Farmers in Major Irrigation Schemes

Issue	Anuradhapura %				Ampara %				Kilinochchi %				Total %			
	1 st	2 nd	3 rd	T	1 st	2 nd	3 rd	T	1 st	2 nd	3 rd	T	1 st	2 nd	3 rd	T
Water scarcity	80	10	5	91	30	19	9	50	44	4	-	48	53	12	5	66
Crop damages from animals	7	38	29	53	2	19	22	30	-	-	17	7	3	22	23	34
Weedicides	2	15	19	24	7	11	30	32	7	-	25	19	5	10	25	26
Paddy marketing	2	3	10	9	11	3	13	20	22	25	8	48	10	8	11	22
Seed paddy	2	15	14	22	11	11	4	23	-	4	-	4	5	11	7	18
Pest and disease attacks	-	8	5	9	16	-	4	18	4	13	8	19	7	6	5	15
Inorganic fertilizers	-	5	5	7	5	6	4	11	7	21	17	33	3	9	7	15
Labour	2	3	10	9	-	-	-	-	11	21	-	30	3	6	4	10
Machineries	4	-	-	4	-	22	-	18	4	4	-	7	3	9	-	10
Natural disasters	-	-	-	-	7	3	4	11	-	4	-	4	3	2	2	5
Soil fertility	-	-	-	-	7	-	9	11	-	-	8	4	3	-	5	5
Irrigation systems	-	3	5	4	2	3	-	5	-	4	-	4	1	3	2	4
Agricultural roads	-	-	-	-	-	3	-	2	-	-	8	4	-	1	2	2
Lack of technology and extension officers	-	-	-	-	2	-	-	2	-	-	-	-	1	-	-	1
Paddy drying facilities	-	-	-	-	-	-	-	-	-	-	8	4	-	-	2	1
Total number of respondents	45	39	21	45	44	36	23	44	27	24	12	27	116	99	56	116

Note: T denotes Total for the district/major irrigation schemes
Source: Field Survey, 2017

Table 7.10: Main Issues Faced by the Sample of Paddy Farmers in Minor Irrigation Schemes

Issue	Kurunegala %				Polonnaruwa %				Total %			
	1 st	2 nd	3 rd	T	1 st	2 nd	3 rd	T	1 st	2 nd	3 rd	T
Water scarcity	98	-	-	98	64	8	4	73	81	4	2	86
Seed paddy	-	47	15	47	2	8	22	22	1	27	19	34
Crop damages from animals	-	3	20	11	9	40	11	51	4	22	15	31
Weedicides	2	3	15	11	7	15	7	24	4	9	11	18
Pest and disease attacks	-	8	15	13	4	8	11	18	2	8	13	16
Irrigation systems	-	8	10	11	4	8	15	20	2	8	13	16
Labour	-	11	10	13	-	8	7	11	-	9	9	12
Natural disasters	-	8	5	9	4	-	11	11	2	4	9	10
Agricultural roads	-	5	10	9	-	3	11	9	-	4	11	9
Paddy marketing	-	-	-	-	2	5	-	7	1	3	-	3
Inorganic fertilizers	-	8	-	7	-	-	-	-	-	4	-	3
Lack of organic fertilizers and its technology	-	-	-	-	2	-	-	2	1	-	-	1
Total number of respondents	45	38	20	45	45	40	27	45	90	78	47	90

Note: T denotes Total for the district/minor irrigation schemes
Source: Field Survey, 2017

Table 7.11: Main Issues Faced by the Sample of Paddy Farmers in Rain-fed Cultivation

Issue	Matara %			
	1 st	2 nd	3 rd	T
Crop damages from animals	18	24	24	50
Labour	10	12	14	28
Weedicides	13	6	14	25
Natural disasters	10	9	10	23
Inorganic fertilizers	8	15	5	23
Water scarcity	15	6	5	23
Seed paddy	8	15	-	20
Irrigation systems	8	3	14	18
Pest and disease attacks	8	6	-	13
Machinery	5	3	10	13
Paddy marketing	-	-	5	3
Total number of respondents	40	33	21	40

Note: 'T' denotes Total for the district

Source: Field Survey, 2017

Next, difficulties faced by OFC farmers were studied and presented in Table 7.12, 7.13, 7.14 and 7.15. The main issues the potato farmers confronted related to marketing the harvest (52%), poor quality and expensive seeds (45%), water scarcity (41%), high cost of agro-chemicals (31%) and pest and disease attacks (24%). Issues related to inorganic fertilizers such as high cost, delay and the inadequacy of the grant and quality had been recorded at the eighth place (Table 7.12). For the onion farmers, the main issue related to the dearth and high cost of labour (54%) followed by pest and disease attacks (46%), non-availability and high cost of machinery (33%) and marketing of the harvest (29%). As in the case of potato farmers, issues related to inorganic fertilizers had been placed at eight (Table 7.13). For the chilli farmers, main issue was marketing the harvest (33%) followed by labour issues (29%) and water scarcity (25%). Inorganic fertilizers related issues had been placed at the fourth place (Table 7.14). Among the maize farmers, the natural disasters such as droughts dominated (61%) followed by crop damages by animals such as peacocks, wild elephants, monkeys, wild boars (54%) and high cost and poor quality seeds (25%). Similar to chilli farmers, issues related to inorganic fertilizers had been placed at the fourth place (Table 7.15).

Table 7.12: Main Issues Faced by the Sample of Potato Farmers in Badulla

Issue	Potato Farmers %			
	1 st	2 nd	3 rd	Total
Marketing the harvest	14	18	35	52
Seeds	17	21	12	45
Water	21	11	18	41
Agro-chemicals	14	7	18	31
Pest and disease attacks	14	11	-	24
Crop damages by animals	3	14	6	21
Labour	3	7	12	17
Inorganic fertilizers	7	-	-	7
Lack of technology and extension officers	3	4	-	7
Weedicides	-	4	-	3
Machinery	-	4	-	3
Irrigation systems	3	-	-	3
Total number of respondents	29	28	17	29

Source: Field Survey, 2017

Table 7.13: Main Issues Faced by the Sample of Onion Farmers in Jaffna

Issue	Onion Farmers %			
	1 st	2 nd	3 rd	Total
Labour	17	42	9	54
Pest and disease attacks	38	11	-	46
Machinery	-	5	64	33
Marketing of harvest	13	11	18	29
Weedicides	21	5	-	25
Crop damages by animals	4	16	-	17
Water scarcity	4	5	9	13
Inorganic fertilizers	4	5	-	8
Total number of respondents	24	19	11	24

Source: Field Survey, 2017

Table 7.14: Main Issues Faced by the Sample of Chilli Farmers in Jaffna

Issue	Chilli Farmers %			
	<i>1st</i>	<i>2nd</i>	<i>3rd</i>	<i>Total</i>
Marketing of harvest	25	6	17	33
Labour	13	11	33	29
Water	13	11	17	25
Crop damages by animals	8	17	-	21
Pest and disease attacks	4	17	17	21
Machinery	8	17	-	21
<i>Irrigation systems</i>	17	6	-	21
Inorganic fertilizers	4	11	17	17
Weedicides	4	6	-	8
Agro-chemicals	4	-	-	4
<i>Total number of respondents</i>	24	18	6	24

Source: Field Survey, 2017

Table 7.15: Main Issues Faced by the Sample of Maize Farmers in Moneragala

Issue	Maize Farmers %			
	<i>1st</i>	<i>2nd</i>	<i>3rd</i>	<i>Total</i>
Natural disasters	39	17	25	61
Crop damages by animals	18	39	25	54
Seeds	14	6	17	25
<i>Inorganic fertilizers</i>	11	-	25	21
Water scarcity	7	17	8	21
Pest and disease attacks	7	6	-	11
Marketing of harvest	-	11	-	7
Machinery	4	-	-	4
Lack of technology and extension officers	-	6	-	4
<i>Total number of respondents</i>	28	18	12	28

Source: Field Survey, 2017

CHAPTER EIGHT

Fertilizer Subsidy in Sri Lanka: Macro Level Perspectives

8.1 Introduction

Changes experienced by the farmers and implementers and their perceptions with the introduction of FCG programme in 2016 were discussed in Chapters Six and Seven. This chapter presents the changes occurred at the macro level with the introduction of FCG programme and discusses the types of fertilizers imported, registered state and private companies that are involved in importation, the government expenditure on the fertilizer subsidy, the beneficiaries of the subsidy, fertilizer usage by paddy farmers and average paddy production.

8.2 Fertilizer Imports and Importers

Of the inorganic fertilizers required for paddy as well as other agricultural crops, the majority is imported by state-owned and private companies. Importation of fertilizer requires prior registration with the National Fertilizer Secretariat (NFS) and compliance with importation rules. Prior to importing fertilizers, fertilizer importing companies are required to apply for a license accompanied by the prescribed fee. Upon receipt of the application form and the prescribed fee, the NFS may register the fertilizer importing company by issuing a license and a license number. Each license is valid for a period of 12 months from the date issued. Thus, fertilizer importing companies are required to forward their applications for the renewal of the licenses to the NFS 30 days prior to the date of expiration. If the companies have abided by the regulations of fertilizer importation and the prescribed fee paid, their licenses are renewed.

Generally, fertilizers imported fall into two major categories: straight fertilizers and mixed fertilizers. In addition, fertilizer importing companies may formulate mixed fertilizers using straight fertilizers as initial raw materials. Such fertilizers are called formulators. In that context, the total requirement of nitrogen and potassium and nearly 82 percent of the phosphorus requirement are imported to the country (Abeygunawardane, 2014). Urea, the most predominantly used nitrogen fertilizer in Sri Lanka is imported mainly from China and the United Arab Emirates. The main potassium and phosphorus containing fertilizers imported to Sri Lanka are Muriate of Potash and high-soluble Triple Super Phosphate respectively. The only type of fertilizer manufactured in Sri Lanka is phosphorus and the country's production is around 18 percent of the total phosphorus fertilizer requirement. Despite the availability of a massive rock phosphate deposit in Eppawala, Sri Lanka manufactures a low-soluble

phosphate fertilizer which is of lower quality due to exorbitant price of technical facilities (Weerahewa *et al.*, 2010).

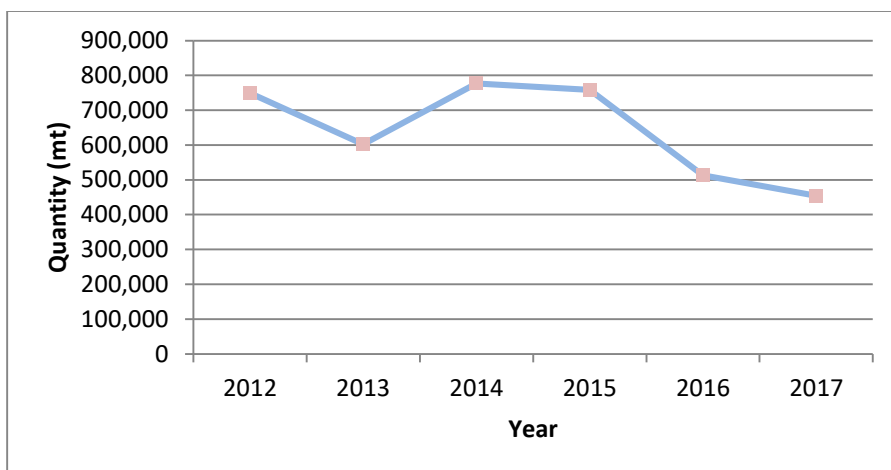
Further, fertilizers are imported either as solids or liquids. Primarily, fertilizers imported by the state-owned companies generally are of the solid form. Only the private companies are involved in importing liquid fertilizers. Table 8.1 shows the solid fertilizer imports for agriculture in Sri Lanka over the past five years. The total quantity imported was generally more or less the same from 2012 to 2015. However, with the introduction of the Fertilizer Cash Grant Programme, the imported solid fertilizer quantity in 2016 had dropped by 32 percent compared to that of the previous year and it had declined by another 11 percent in 2017 (Figure 8.1). Other than the change in the programme, the drought conditions that prevailed since 2016 followed by decreased cultivation extents might have also caused less importation of fertilizers.

As said earlier, both state-owned and private companies import fertilizers and state-owned companies had played a dominant role from 2012 to 2015. However, with the change of the programme since 2016 the involvement of the state-owned companies in importing fertilizers had significantly declined and it was only 11 percent and five percent of the total imports in 2016 and 2017 respectively (Figure 8.2).

Table 8.1: Annual Solid Fertilizer Imports for Agriculture: 2012-2017

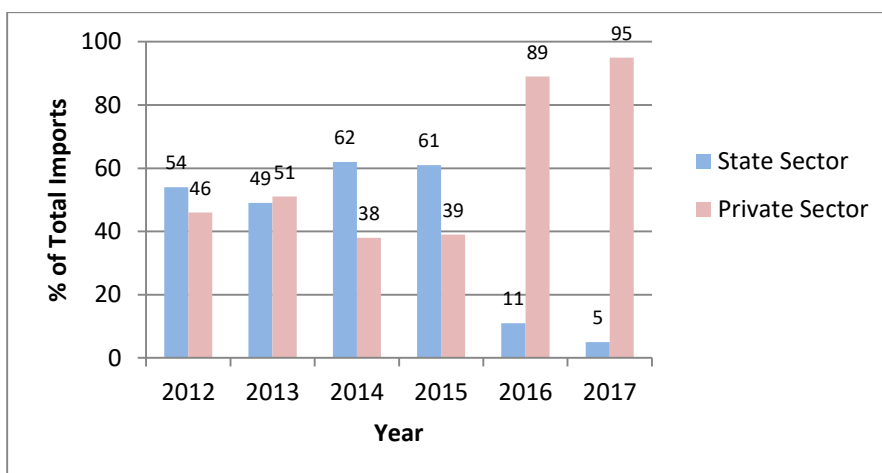
Year	Fertilizer Imports as Solid (Quantity)				Total Quantity (mt)
	State Sector		Private Sector		
	Amount (mt)	%	Amount (mt)	%	
2012	407,414	54	341,493	46	748,907
2013	294,128	49	308,013	51	602,141
2014	480,093	62	297,002	38	777,096
2015	465,395	61	293,256	39	758,651
2016	58,663	11	453,983	89	512,646
2017	22,263	5	431,685	95	453,948

Source: National Fertilizer Secretariat



Source: National Fertilizer Secretariat

Figure 8.1: Solid Fertilizer Imports for Agriculture: 2012-2017

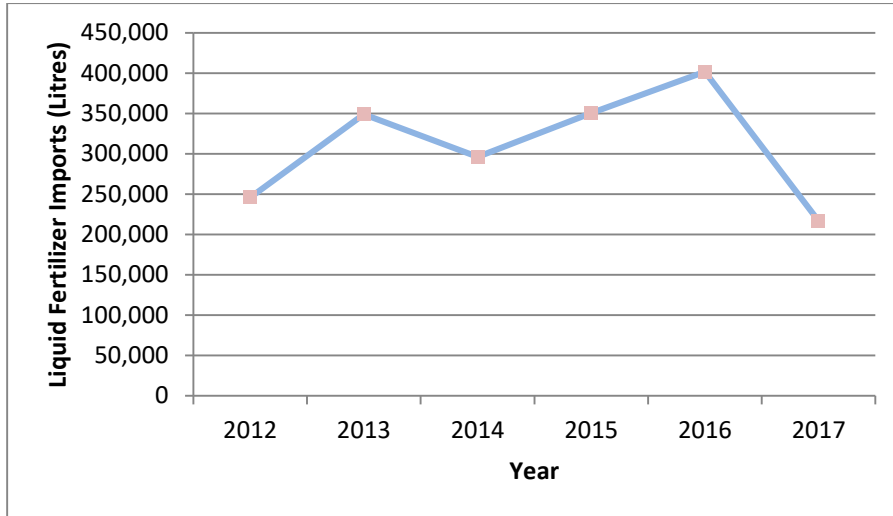


Source: National Fertilizer Secretariat

Figure 8.2: Solid Fertilizer Imports for Agriculture by Sectors: 2012-2017

As mentioned earlier, liquid fertilizers are imported to the country by private companies. These liquid fertilizers are mainly imported as mixtures and they contain a number of major and minor nutrients plus growth promoting substances. They are either used in hydroponics or as fertigation mixtures and are applied mainly on vegetable, horticultural and plantation crops. Therefore, liquid fertilizers are very rarely used by paddy farmers. However, OFC farmers use a little volume of liquid fertilizers along with the solid fertilizers to boost the growth and improve the harvest. Therefore, liquid fertilizer quantities imported to the country during 2012-2017 were also investigated and are presented in Figure 8.3. It shows that imports had increased by 16

percent in 2016 compared to 2015 and had declined in 2017 by 46 percent compared to 2016.



Source: National Fertilizer Secretariat

Figure 8.3: Liquid Fertilizer Imports for Agriculture by the Private Sector: 2012-2017

There were 56 registered fertilizer importers in 2013 who had increased to 81 in 2015. In 2016, it was 87 and had decreased to 83 in 2017. The drop in 2017 was observed due to the non-renewal of licenses by four importers. In general, major importers renew their license each year whereas minor importers may not follow that. If a company discontinues the license in a specific year, but, decides to renew it in the following year the company has to get registered again and obtain a new license. Along with the new license, they are given a new license number. Therefore, the number of fertilizer importers had increased by seven percent in 2016 compared to that of 2015.

The registered fertilizer importers comprise of state-owned and private companies and as mentioned earlier they import straight granular fertilizers, liquid fertilizers and fertilizer mixtures. Of the importers, two state-owned companies are operated under the purview of the Ministry of Agriculture in Sri Lanka and there are 14 main importers in the private sector and Table 8.2 lists the major fertilizer importing companies.

Table 8.2: Leading State-owned and Private Fertilizer Importing Companies in Sri Lanka

Sector	Name of the Company
State-owned	Ceylon Fertilizer Company Limited
	Colombo Commercial Fertilizers Limited
Private	A Baur and Company Private Limited
	CIC Agri Businesses Private Limited
	Lankem Ceylon PLC
	Allied Commercial Fertilizers Private Limited
	Asia Commercial Fertilizer Private Limited
	AgStar PLC
	Blue Deebaj FZCO
	Sabaragamuwa Fertilizers Private Limited
	Grand Crop Care Solutions Private Limited
	Heyday Agro Business Private Limited
	Harcros Chemicals Private Limited
	Lak Govijana Fertilizers Private Limited
	Lanka Agri Trade Private Limited
	Srilak Fertilizers Private Limited

Source: National Fertilizer Secretariat

8.3 Government Expenditure on the Subsidy

Since 1962, provision of a subsidy on fertilizers has been a regular feature for the governments in Sri Lanka. Thus, the state has to spend a tremendous sum to continue the fertilizer subsidy programme despite budgetary constraints. Some scholars argue that the fertilizer subsidy is a far-sighted future investment aimed at increasing the agricultural productivity, whilst the others consider it as an unnecessary burden on the crisis ridden government coffers. Nevertheless, the fertilizer subsidy programme is believed to be amongst the most expensive policies implemented for the betterment of agriculture in Sri Lanka (Weerahewa *et al.*, 2010; Abeygunawardane, 2014).

The government expenditure on the fertilizer subsidy since 2005 to 2015 shows an increasing trend except in a few years during which the provision method or the quantity of the subsidy was altered (Table 8.3 and Figure 8.4). For example, since 2005 until 2007 the government expenditure on the fertilizer subsidy has increased gradually. In addition to the paddy farmers, small holder farmers in the plantation sector also came into the fold of those eligible for the fertilizer subsidy in 2006 and therefore, a slight surge of the expenditure was apparent in 2006 compared to 2005. By late 2008, prices of nitrogen, phosphorus and potassium fertilizers had multiplied by three to five-

fold resulting in a drastic increment of the expenditure, which is more than two-fold (Abeygunawardane, 2014). Since May 2011, the subsidy programme was extended to cover all crops. In that circumstance, continuation of the subsidy programme for paddy and the introduction of subsidised fertilizer prices for other crops had doubled the expenditure on the fertilizer subsidy by 2011 in comparison to the previous year and it was almost a seven-fold increment of the expenditure incurred in 2005. At that time, straight and mixed fertilizers were available at the markets for prices ranging between Rs.1,200.00-1,300.00/50 kg. In 2013, for the first time in a decade, the government experienced a decline in the expenditure on the fertilizer subsidy with the introduction of a new fertilizer recommendation scheme for paddy by the Department of Agriculture. In fact, the new fertilizer recommendation consisted of reduced fertilizer levels marking a reduction in the fertilizer quantities given for each farmer. This resulted in a significant reduction of the economic burden from the fertilizer subsidy (Figure 8.5). It was a 59 percent decline in the government expenditure as a percentage of GDP (Table 8.3).

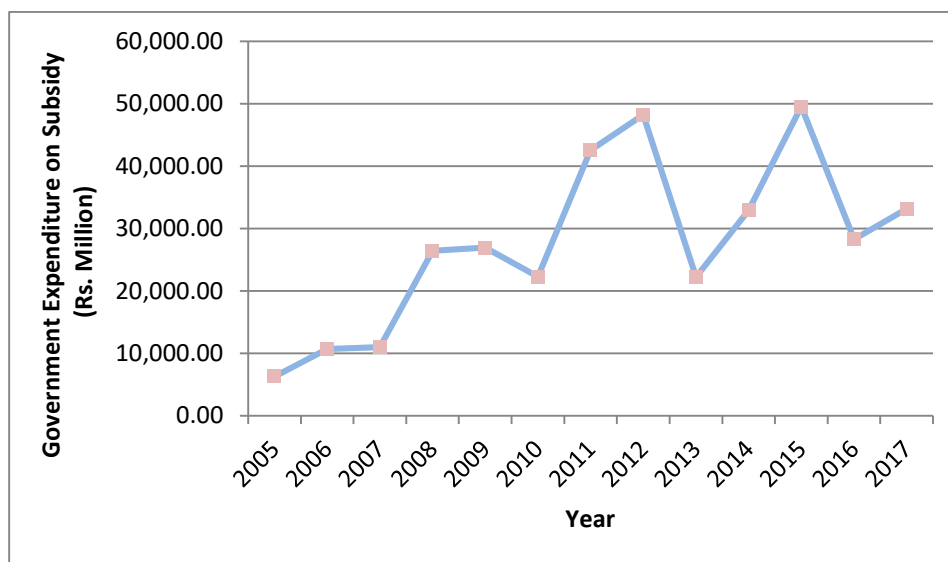
With the switch over to the Fertilizer Cash Grant Programme in 2016, the government was able to save Rs.21,304 million compared to the previous year 2015 and it was a 43 percent reduction in the government expenditure (Table 8.3 and Figure 8.4). At the same time, it was a 47 percent decline in the government expenditure as a percentage of GDP (Table 8.3 and Figure 8.5). However, the drought conditions that prevailed in the major paddy growing regions in Sri Lanka in 2016 led to a significant reduction of cultivation, thereby reducing the number of farmers eligible to receive the cash grant. This also contributed to the reduction in cost other than the change in the programme. In 2017, the government expenditure has increased once again by 17 percent compared to that of 2016. At the same time, it was 33 percent reduction in expenditure and 44 percent decline in the government expenditure as a percentage of GDP compared to that of 2015 (Table 8.3).

According to the sources of the NFS, still there is an accumulated interest due for previous debts obtained during the subsidy programme implemented before 2016. The general practice at that time was to obtain a loan from a state bank to pay the fertilizer importers for the fertilizers imported. After 2016, this practice ceased and the expenditure on the programme was directly transferred by the government treasury. However, the NFS is still paying back the loans and accumulated interests on loans obtained prior to 2016. In analysing the expenditure in 2016, 52 percent of the total expenditure was on the loan and the accumulated interest and in 2017 it was 63 percent from the total expenditure. Therefore, one of the advantages of the FCG programme is that need not obtain further loans.

Table 8.3: Government Expenditure on the Fertilizer Subsidy

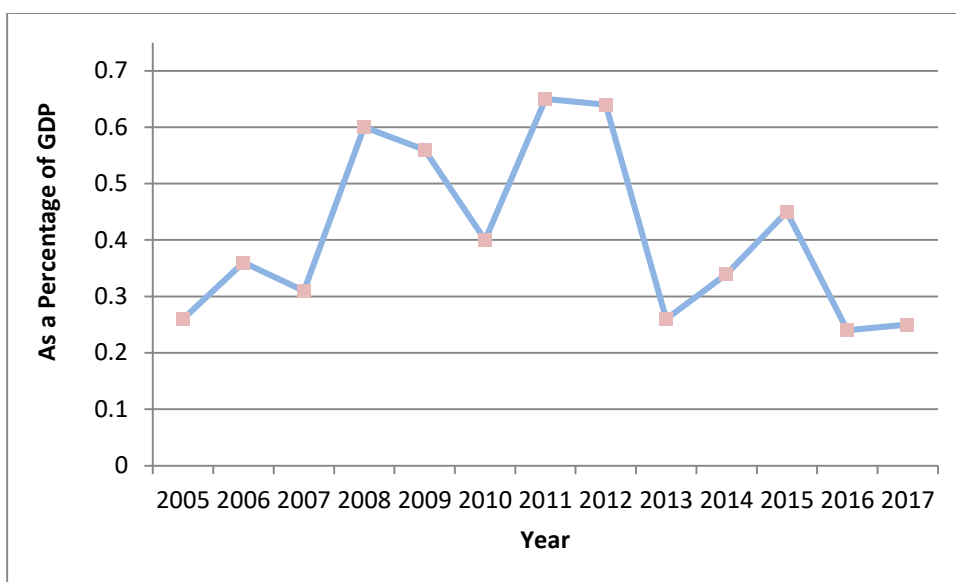
Year	Government Expenditure on Subsidy (Rs. Million)	GDP (Rs. Billion)	As a Percentage of GDP
2005	6,285.5	2,452.8	0.26
2006	10,699.4	2,938.7	0.36
2007	10,998.3	3,578.7	0.31
2008	26,449.8	4,410.7	0.60
2009	26,935.1	4,835.3	0.56
2010	22,277.7	5,604.1	0.40
2011	42,540.6	6,543.3	0.65
2012	48,233.3	7,578.6	0.64
2013	22,251.7	8673.9	0.26
2014	32,910.5	9,784.7	0.34
2015	49,569.9	10,951.7	0.45
2016	28,266.0	11,906.8	0.24
2017	33,157.5	13,289.5	0.25

Source: National Fertilizer Secretariat and Central Bank Annual Reports



Source: National Fertilizer Secretariat

Figure 8.4: Government Expenditure on the Fertilizer Subsidy: 2005-2017



Source: Central Bank Annual Reports

Figure 8.5: Government Expenditure on the Fertilizer Subsidy as a Percentage of GDP: 2005-2017

8.4 Number of Farmers Assisted through Fertilizer Subsidies

The number of farmers assisted through fertilizer subsidies is generally higher in *Maha* seasons compared to *Yala* seasons since paddy farming is predominant in major cultivation regions during the *Maha* season. Table 8.4 shows the number of farmers assisted in *Maha* seasons since 2012/13. Accordingly, only a seven percent reduction was observed with the introduction of the FCG programme. On the other hand, as mentioned earlier, the drought condition which prevailed in the country also contributed to drop in the number of farmers cultivated. However, in the following season in 2017/18, this number had increased by four percent.

In analysing the data from 2012 to 2015 *Yala* seasons, it is revealed that the number of beneficiaries of the fertilizer subsidy had come down in 2014 by 18 percent due to the drought conditions in the country which caused a delay in the cultivation in the *Yala* season (Table 8.5). With the change in the fertilizer subsidy programme, the number of beneficiaries has not changed significantly in 2016 just recording an eight percent increment compared with that of 2015. However, the severe dry spell in 2016 *Yala* onwards led to a drop in the extent coming under paddy. Farmers who did not cultivate during that year had the Fertilizer Cash Grant transferred to the following seasons 2016/17 *Maha* and 2017 *Yala* but were not eligible to apply for the cash grant again in the following seasons. Therefore, this might have caused a 26 percent reduction in the number of beneficiaries in 2017 *Yala* season (Table 8.5).

Table 8.4: Number of Paddy Farmers Assisted by Fertilizer Subsidy Programmes in Maha Seasons

Year	Number of Paddy Farmers Assisted	Change in % Compared to the Previous Year
2012/13	1,044,343	
2013/14	941,792	(-) 10
2014/15	998,710	(+) 6
2015/16	910,320	(-) 9
2016/17	846,537	(-) 7
2017/18	882,299	(+) 4

Source: National Fertilizer Secretariat

Table 8.5: Number of Paddy Farmers Assisted by Fertilizer Subsidy Programmes in Yala Seasons

Year	Number of Paddy Farmers Assisted	Change in % Compared to the Previous Year
2012	652,281	
2013	658,560	(+) 1
2014	538,048	(-) 18
2015	705,370	(+) 31
2016	760,347	(+) 8
2017	558,931	(-) 26

Source: National Fertilizer Secretariat

8.5 Paddy Production and Fertilizer Usage

As shown in Table 8.6, price of fertilizer does not necessarily affect the average fertilizer use and average paddy production and usage and production had been strongly controlled by the fertilizer subsidy schemes operated in the country. As explained in Chapter Three, subsidies were not entertained for the period between 1990 and 1994 due to soaring fertilizer prices in the international market coupled with rising oil prices and the depreciation of the exchange rate. Therefore, a lower usage of fertilizer was recorded from 1990-1994 as the subsidy has not been provided for paddy cultivation. However, the upward revision of the guaranteed price of paddy did not result in a marked decline of consumption as the government envisaged.

With the advent of the full subsidy in 1995, usage of fertilizer increased once again and the average use of fertilizer by the farmers has continually risen up with the government's dual policy to provide either a urea-only or a full subsidy for paddy farmers. However, with the introduction of a new fertilizer recommendation by the Department of Agriculture in 2013, fertilizer levels used had decreased significantly (Table 8.6). Conversely, there was no significant change in the average production despite the reduction in the fertilizer usage. At the same time, in 2016 cultivation was abandoned due to the severe drought that prevailed in most paddy cultivated regions in the country. Therefore, it is far from the truth to conclude that the introduction of the FCG programme negatively impacted the usage or the production.

Table 8.6: Annual Average Paddy Productions and Fertilizer Usage

Year	Average Fertilizer Use (kg/acre)	Average Price of Fertilizer (SLRs/kg)	Average Annual Paddy Production (kg/acre)
1990	136.6	9.35	1950.6
1991	133.8	9.79	1928.8
1992	141.0	10.29	2030.3
1993	132.2	10.95	1943.0
1994	117.5	12.08	1955.7
1995	144.8	11.58	2089.6
1996	155.2	14.74	1895.1
1997	144.0	15.51	1904.2
1998	157.0	9.88	2109.3
1999	154.0	8.13	2156.1
2000	154.1	9.60	2188.8
2001	156.6	10.93	2075.0
2002	164.2	10.31	2107.0
2003	174.0	10.88	2266.0
2004	174.9	11.52	2183.8
2005	166.6	11.62	2151.1
2006	169.9	11.50	2178.9
2007	173.0	11.61	2195.1
2008	162.5	12.88	2176.0
2009	172.2	11.70	2134.5
2010	180.3	11.18	1913.2
2011	179.3	11.82	1758.9
2012	168.4	NA	1738.1
2013	123.7	28.00	1758.4
2014	126.3	52.54	1704.9
2015	114.0	50.75	1799.2
2016	NA	44.72	1769.3
2017	NA	46.13	1738.9

Note: NA – Not Available

Source: Department of Agriculture

CHAPTER NINE

Summary, Major Findings, Discussion, Conclusion and Recommendations

9.1 Introduction

Preceding chapters discuss the fertilizer subsidy programmes in Sri Lanka and their operational mechanisms, changes with the introduction of Fertilizer Cash Grant Programme, perception towards the Fertilizer Cash Grant Programme and the macro situation of the country with reference to the fertilizer subsidy programmes. Therefore, this chapter concludes the report by providing a summary, major findings with a discussion, conclusion and recommendations to improve the fertilizer subsidy policy of the country in the future.

9.2 Summary, Major Findings and Discussion

Fertilizer is an essential input to the agricultural production process and it can be broadly divided into two groups based on the source as inorganic and organic fertilizers. Non-availability of substitutes for fertilizer has forced farmers to apply fertilizer under any circumstance to ensure the optimum yield levels. Therefore, strong fertilizer related policies have taken centre stage in improving agricultural productivity bringing in large scale agricultural input subsidies to the fore.

In this backdrop in Sri Lanka in the post-independent era, governments elected to power have been set to bear the brunt of highly subsidised fertilizer provision which occupied a permanent niche in socio-political-economic agenda under the banner of achieving self-sufficiency in rice and ensuring food security.

Having passed many milestones, the implementation strategy of the fertilizer subsidy programme in Sri Lanka was changed in 2016 to a Fertilizer Cash Grant (FCG) Programme. Under this scheme, paddy farmers were entitled for a cash subsidy of Rs.25,000 per hectare per year subjected to a maximum of Rs. 50,000 per year. Accordingly, a farmer is eligible to apply the subsidy for paddy fields of two hectares or less. Only the farmers cultivating (i) potato, (ii) onion, (iii) chilli, (iv) soya bean and (v) maize were entitled to the cash subsidy of OFCs and a farmer got a cash subsidy of Rs.10,000 per hectare per year.

This study was carried out to review the FCG programme to make appropriate policy recommendations for designing an effective subsidy programme in the future with the specific objectives of (i) examining the operational mechanism of the programme,

(ii) ascertaining the farmers' responses towards the FCG programme and identifying the challenges faced by both implementers and beneficiaries of the programme, (iii) assessing the cost-effectiveness of two fertilizer subsidy programmes and (iv) proposing strategies and recommendations for an effective fertilizer subsidy scheme in the future.

Qualitative and quantitative data that was collected using key informant interviews, sample survey, case studies and focus group discussions from September to December 2017 was used. Multi-staged random sampling technique was used to identify the respondents of the survey. Data and information collected from various sources using various tools mentioned above were subjected to a descriptive analysis.

The Sample

A total of 270 paddy farmers from Anuradhapura, Ampara, Kilinochchi, Kurunegala, Polonnaruwa and Matara representing major, minor and rain-fed cultivation systems and 120 other field crop farmers from Badulla (potato), Jaffna (red onion and chilli) and Moneragala (maize) districts were selected for the study.

The majority of farmers (86% of paddy and 70% of OFC) were men and majority (75% of paddy and 84% of OFC) concentrated in the age group 40-70 years. More young farmers (age group 20-39) were noted in Kilinochchi (29%) and Polonnaruwa (24%) and among chilli (20%) and maize (20%) farmers compared to other districts. Nearly half of farmers in the sample (48% of paddy and 47% of OFC) had three to four members in their families.

The highest number of farmers (28% of paddy and 38% of OFC) had studied up to grade six to ten followed by those who sat for Ordinary Level (24% of paddy and 18% of OFC) and grade one to five (22% of paddy and 18% of OFC). The majority of farmers (85% of paddy and 69% of OFC) were from *Samurdhi* non-recipient families and *Samurdhi* recipient families among the OFC group (31%) almost double the paddy farmers (15%).

Most of the farmers (70% of paddy and 78% of OFC) were having more than one income source in their families indicating that they have more resilience to economic shocks. With respect to the nature of income sources, the majority (67% of activities of paddy and 74% of OFC farmers) were agriculture related activities. Of the paddy farmers under major irrigation schemes, the main income source of the majority was paddy cultivation. However, of the farmers under minor irrigation, the majority only in Polonnaruwa (80%) pursued paddy farming as the main income source and it was so only for nearly one fourth (24%) of the farmers in Kurunegala. Further, none of the farmers in Matara had paddy farming as their main income source. Of the OFC farmers, onion for 83 percent, chilli for 80 percent, maize for 60 percent and potato for 50 percent of farmers were the main income source.

The majority of paddy farmers except in Kurunegala and Matara were selling more than 50 percent of their harvest and the highest number of farmers in Kurunegala and the majority in Matara use the entire harvest for their family consumption. All the OFC farmers in the sample had cultivated OFCs for the market.

The highest number of paddy, potato and maize farmers belong to families having an annual income of more than Rs. 500,000. However, the highest number of onion (30%) and chilli (47%) farmers are from families having an annual income ranging from Rs. 50,001 – 100,000.

The majority of farmers (89% of paddy and 88% of OFC) had their own cultivable lands. Of the paddy farmers, tenant farming was noted prominently in Kilinochchi, Kurunegala and Matara while, more leased farmers were in Killinochchi, encroached paddy lands reported only in Polonnaruwa and cultivators on roster basis only in Matara. Of the OFC farmers, tenant farming was observed only among onion and chilli farmers while, farming on leased lands was prominent among the growers of onion and chilli and farming on encroached lands only in Moneragala.

The majority of paddy farmers except in Matara and Kurunegala owned paddy lands of more than two acres and in Matara and Kurunegala they owned two acres or less. The majority of maize farmers also owned cultivable lands of more than two acres while, the majority of other types of OFC farmers had one acre or less.

Most of the paddy farmers were only members of their respective farmer organisations and there was no specific farmer organisations for the OFC farmers in the locations studied.

In addition, key informant interviews and focus group discussions were carried out with the following government officials who were the implementers of the subsidy programme using guides: District Secretaries, Additional District Secretaries, District Assistant Directors (Fertilizer), Agrarian Development Deputy Commissioners, Agrarian Development Assistant Commissioners, Agrarian Development Divisional Officers (DOs), Agrarian Development Officers and Agriculture Research and Production Assistants of the locations identified for the sample survey.

Changes with the Introduction of Fertilizer Cash Grant Programme

The Fertilizer Cash Grant Programme has been in force since 2016 *Yala* and at the time of the study, the farmers have cultivated 2016 *Yala*, 2016/17 *Maha* and 2017 *Yala*.

It was found that most of the paddy farmers had received the cash grant. The main reason for non-cultivation or non- receipt of the grant for the seasons was the drought.

At the same time, two percent each in Matara and Polonnaruwa in 2016 *Yala* and two percent each in Anuradhapura, Polonnaruwa and Matara in 2017 *Yala* had not received the grant despite having applied for it. Therefore, one percent of farmers ($N=270 \times 3=810$) had not received the grant despite their application for the grant.

In Anuradhapura, farmers have practised mixed-cultivation as agreed at the *Kanna* meetings and only 29 percent in 2016 *Yala*, 43 percent in 2016/17 *Maha* and 20 percent in 2017 *Yala* had cultivated only paddy due to water scarcity. Other crops cultivated were soya, onion, vegetables, banana, yams, maize and black gram.

The cultivation was successful only for 65 percent of farmers in 2016 *Yala*, only 66 percent in 2016/17 *Maha* and only for 54 percent in 2017 *Yala* and for others it was hampered by the drought. The Central Bank annual report for the Year 2017 also confirmed that the prolonged drought, floods and the erratic rainfall prevailed throughout 2016 and 2017 causing production levels to decline across the agriculture sector and the severe drought conditions that prevailed particularly in the major cultivation areas affected the agriculture activities.

At the same time, in Matara and Polonnaruwa in 2016 *Yala*, Matara in 2016/17 *Maha* and in 2017 *Yala* there were cases of dwindled harvest due to delay in applying fertilizer. Failure to apply the sufficient quantity of fertilizer also caused the harvest to decline in Anuradhapura and Matara in 2016 *Yala*, Matara in 2016/17 *Maha* and Polonnaruwa and Ampara in 2017 *Yala*. Therefore, four and five percent of farmers ($N=72+90+84=246$) attributed the low harvest to delay in applying fertilizer and the shortfall in the application of fertilizer in proper quantities respectively. Substandard fertilizer was another reason cited by a respondent in Polonnaruwa in 2017 *Yala*.

Contrary to paddy, all the OFC farmers participated in the study had received the Fertilizer Cash Grant in 2016. In 2017, having applied they were awaiting the grant at the time of the study. In 2016 in all the locations farmers had practised a mixed cultivation and it was prominent among onion farmers as three quarter of them had cultivated chilli as well. Only the majority of chilli and maize farmers had obtained a successful harvest while most of the potato and onion farmers had failed. The main reason highlighted by all the farmers except onion farmers for the failure was drought and for onion farmers it was floods. However, one fourth of potato farmers who failed attributed it to poor quality of fertilizer.

The majority of farmers (89% of paddy and 83% of OFC) have not experienced a significant change in their cultivated extent after 2016. However, only three percent of paddy farmers from the entire sample (five in Kilinochchi, one each in Ampara and Matara) have experienced a decrease in cultivated extent due to the issues in the FCG

programme such as delay in getting the cash grant and the insufficiency of the grant to buy the required quantity of fertilizer which was prominent under major irrigation schemes. Only one maize farmer claimed an increase in the land extent as he got the grant in 2016 and two percent (one each of potato and maize farmers) stated that they had to cut down the cultivable extent as they could not buy sufficient fertilizer with the introduction of the FCG programme.

The drought has adversely affected the harvest of nearly half of paddy farmers after 2016 specially in Anuradhapura (76%) and Polonnaruwa (71%). Fewer farmers who also experienced a decline attributed it to the inability to buy the required quantity of fertilizer (13%), the delay in receiving the grant (6%) and low quality of fertilizer (1%). A very few farmers (4%) who had recorded an increase in harvest in all the locations excluding Polonnaruwa claimed the following reasons for the increase: application of good quality fertilizer at the right time, correct usage of inorganic fertilizer and dependence on more organic fertilizer.

With regard to OFC farmers nearly 40 percent had experienced a decline in the harvest, noticeably among potato farmers due to the drought and onion farmers due to the floods. However, fewer potato and maize farmers have experienced a decrease owing to inability to buy the required amount of fertilizer (7%) and poor quality (6%). At the same time, maize, potato and chilli farmers (7%) had responded positively ie. increased harvest due to either good quality of fertilizer or application of required amount of inorganic fertilizer.

Therefore, the majority of farmers were of the view that fertilizer related factors have not resulted in any significant changes either on the paddy or OFC land cultivated extents or paddy and OFC harvests after the introduction of FCG programme.

The main objectives of introducing the FCG programme are to eliminate the over usage of inorganic fertilizer to enhance the usage of organic fertilizer and allow the farmer to make effective decisions with regard to application of fertilizer such as identifying the most suitable quantities of fertilizer required for their fields by conducting a soil test.

Of the entire sample, one fourth of paddy farmers have increased the usage after 2016 and nearly half of them have increased fertilizer by one to 25kg/ac significantly in Kilinochchi, Kurunegala, Polonnaruwa and Ampara. Around 40 percent have increased the quantity by 26 to 50kg/ac noticeably in Anuradhapura and Matara. However, the main reasons to up the quantity were the decreased soil fertility and water scarcity. Only one percent had enhanced the amount due to low quality in fertilizers, delay in Fertilizer Cash Grant and excess usage of fertilizers since purchasing was made on several occasions.

On the other hand, 34 percent of the farmers in the entire sample have decreased the inorganic fertilizer usage prominently in Ampara, Anuradhapura and Matara. Of them, nearly half (45%) have reduced the amount by one to 25kg/ac prominently in Matara, 36 percent by 26 to 50kg/ac prominently in Anuradhapura and 13 percent by 51 to 75kg/ac prominently in Ampara.

On exploring the reasons for the decreased usage, a quarter of the farmers in the entire sample viewed the insufficient grant as the reason to decrease the usage and this was the case among the highest number of farmers in locations under major and minor irrigation schemes. Fewer farmers attributed this to the delay in obtaining the grant (9%) prominently in Matara, non-availability of fertilizer at the market (2%) especially in Kilinochchi, Kurunegala and Matara. Another fewer farmers (1%) from Anuradhapura, Ampara and Kurunegala cited increased usage of organic fertilizer, fertilizer issued after 2016 being of good quality (1%) and using the cash grant to cover other expenses (0.4%) as reasons to cut down the usage.

Therefore, it was observed from that in all the locations fluctuations in usage quantity of inorganic fertilizer could be observed at notable levels among paddy farmers after changing the programme. A considerable number of farmers stated that they had to cut down the usage due to implementation errors of the programme such as insufficient grant (26%), delay in providing the grant (9%) and non-availability of fertilizer at the market at the required time (2%). Surprisingly, a fewer farmers (2%) have marked a decrease in the usage due to positive reasons such as the application of organic fertilizer and the higher quality of fertilizer issued after 2016. Some farmers (1%) had to increase the usage due to the programme related issues such as low quality, delay in the cash grant and excess usage of fertilizers resultant upon making purchases on several occasions. At the same time, misuse of the grant was not observed at significant level.

The majority of OFC farmers have not changed the quantity of inorganic fertilizer they used after the introduction of the FCG programme. However, fewer farmers stated that the quantity was decreased due to high cost of fertilizer (9%), insufficiency of the grant (7%) and delay of the grant (2%) and the fine quality of fertilizer (2%). The majority of them were potato farmers. At the same time, fewer persons had increased the quantity as they received the grant (2%) and the poor quality demanded on increased dosage (1%).

The majority of farmers in all the districts except in Kilinochchi and Anuradhapura were able to manage with the amount of fertilizer provided by the state under the subsidy programme before 2016.

However, the largest number of the paddy farmers under major irrigation schemes had to pay more than the cash grant on fertilizer. This was the case among the majority of farmers under minor irrigation schemes also however, the percentages were low compared to those in major irrigation schemes. In contrast, nearly half under rain-fed farming had either managed with the grant or had saved some money after spending on fertilizer. Of the OFC farmers, all the potato and onion farmers and the majority of chilli and maize farmers had to spend more than the grant to buy fertilizer.

Compared to the previous programme, the majority of paddy farmers under major irrigation schemes and in Polonnaruwa had to spend more on fertilizer after the Fertilizer Cash Grant Programme. However, it was less in Kurunegala (39%) and Matara (27%). While in Kurunegala (54%) and Matara (69%) more than half had spent less or saved money. Of the OFC farmers, the majority of potato, chilli and onion farmers had to spend more on fertilizer with the change and only 30 percent of maize farmers needed more.

The majority of farmers (86% of paddy and 97% of OFC) complained of not getting the grant when they required it. However, the majority of farmers (71% of paddy and 93% of OFC) had applied the required quantity on time and they had purchased the fertilizer having resorted to various financial sources: using their own money, obtaining a loan from an informal source/bank, pawning jewellery, purchasing on credit from fertilizer vendors without or with interest.

One of the changes the new programme envisaged is to reduce the time spent by farmers on attending meetings and on visiting officials to obtain the subsidy. However, only close to half of them have experienced a decrease in time and the majority of them were able to shorten the time by two days or less.

During the fertilizer subsidy programme, the majority of farmers in all the locations except in Kilinochchi had collected fertilizer at a place in the village decided by the respective Farmer Organisation and in Kilinochchi it was the ASCs. With the change in the programme, the majority in all the locations had shifted to retail vendors in the village or nearby to buy fertilizers. Nearly one third of farmers in the sample had their distance to the place of buying reduced though the programme expected to reduce the distance to the place of purchasing fertilizer and nearly half have experienced an increase in distance.

In exploring the changes in usage of organic fertilizer, the majority of paddy and OFC farmers stated that there was no significant change in the usage of organic fertilizer before and after the Fertilizer Cash Grant. Only four paddy farmers (1%) have increased

the amount of organic fertilizer they used due to the high cost of inorganic fertilizer and one farmer due to the delay in getting the cash grant.

The majority of paddy and OFC farmers stated that they have difficulties in using organic fertilizer though they like to increase the usage and the main difficulties faced by them were difficulty in finding, lack of space, time or raw material to prepare, requiring in large quantities, need of more time to prepare, lack of knowledge on preparation/importance, high cost and issues with regard to quality.

None of the farmers in the sample had gone for a soil test recently prior to applying the fertilizer. However, all are willing to have the soil tested if they are provided with easy access at an affordable rate.

Officials who implemented the programme are convinced that they can complete their responsibilities with much ease and attention and with a high degree of accuracy and transparency coupled with lesser time and minimal corruption with the introduction of the Fertilizer Cash Grant Programme. Further, officials have observed such changes as limited interaction between the Agrarian Services Centres and farmers, limitations on the revenue for Agrarian Services Centres and lesser interaction between Farmer Organisations and farmers in the institutional set up at the village level. Officials further mentioned that there are drawbacks of the FCG programme with regard to the number of staff members, capacities of staff, database, infrastructure facilities and Circulars.

Perception towards the Fertilizer Cash Grant Programme

Over half of the farmers (58% of paddy and 53% of OFC) have not experienced any quality difference in the fertilizer provided under the two programmes. Of the paddy farmers who felt a difference, held that the fertilizer provided during the Fertilizer Cash Grant Programme was of better quality. In contrast, of the OFC farmers who had felt the difference, held an opposite view.

With respect to the previous fertilizer subsidy programme, main advantages highlighted by the farmers were the possibility of getting the entire quantity of fertilizer at a lower price, guarantee of applying the required amount of fertilizer on the field and receipt of the required amount of fertilizer totally on time. The majority supported the views. The main disadvantages were more time/paper work/labour requirement, delay in obtaining, poor quality fertilizer and over usage of inorganic fertilizer.

Of the advantages of the Fertilizer Cash Grant Programme, the possibility of buying only the required quantity when needed from any convenient place and involvement of less time and labour topped the list and nearly half of the farmers supported the views. Of the disadvantages, delay in receiving the grant, insufficiency of the grant to buy the

required quantity of fertilizer, more chances to misuse the cash grant and refrain from buying fertilizer, not applying the required amount of fertilizer at the right time, non-availability of fertilizer when required and absence of a system to inform the farmer on money deposits were at the helm and three fourth of farmers supported the views.

These circumstances reflect that the better control over time, place, quantity and quality of buying are considered as advantages of the FCG programme and all the disadvantages are related to the delay in providing and insufficiency of the grant and non-availability of fertilizer at the market when required. Conversely, the advantages highlighted by the farmers with respect to the previous programme also could be achieved with the FCG programme if the implementing errors such as not receiving on time, non-adequacy of the grant and non-availability of fertilizer at the market could be ironed out.

OFC farmers stated that receipt of the grant was an advantage despite its inadequacy. Further, nearly three fourths of the farmers held the view that the ability of buying fertilizers when needed in required amounts at their choice as an advantage. For around 40 percent of the farmers, disadvantages after 2016 were unbearable price increase at the fertilizer market resulting in high cost of cultivation, insufficient grant and delay in providing the grant. Further, a higher percentage of potato farmers claimed there are more disadvantages related to the FCG programme.

With respect to preference, nearly half of the paddy farmers prefer the previous fertilizer subsidy programme while less than 40 percent prefer the Fertilizer Cash Grant Programme and the rest would like to go for a new programme which can provide good quality fertilizer on time. At the same time, the most preferred in all the locations except in Polonnaruwa and Matara was the previous fertilizer subsidy programme, Fertilizer Cash Grant Programme with modifications was the highest preferred in Polonnaruwa and Matara. Further, a notable preference towards the previous programme was observed among the farmers cultivating under major irrigation schemes.

In the circumstances, no strong preference or opposition to the previous programme or to the FCG programme was observed despite many implementation errors of the FCG programme.

The main reasons for the preference of the Fertilizer Cash Grant were the possibility to buy the needed quantity at the time of need from any convenient place, less time consumption and ease and the possibility to gain access to any good quality brand as per choice. On the other hand, the reasons to prefer the previous programme were its affordability and ease in getting fertilizers to the field, receipt of the required total

quantity, timely receipt of fertilizer and guarantee of applying fertilizer on the field and less chances of misusing the money.

Suggestions of Farmers for an Effective Programme

The main suggestions provided by both paddy and OFC farmers were the timely provision of the grant and making the grant sufficient to buy the required quantity of fertilizer. In addition, reducing the price of fertilizer at the open market, making facilities for soil testing, increasing the availability of fertilizer at the open market and making the farmer aware of recommendations were suggested. Further, informing the farmer of money deposits, assuring that the deserving farmer benefits, regular monitoring of the quality of fertilizer at the market, motivating the farmer to use more organic fertilizer and making bags of a smaller size of fertilizer (<50kg) available at the market were suggestions given by the paddy farmers. In addition, providing the grant to other OFCs and vegetables, increasing the upper ceiling of the extent eligible for the grant and making the grant available for cultivations on encroached lands too were suggested by OFC farmers.

Issues Faced by Farmers in Cultivations

Non-availability of adequate water at the time required was the main issue faced by paddy farmers who cultivate under major and minor irrigation schemes. However, the major issue of their counterparts under rain-fed cultivation was the crop damages by animals such as peacocks, wild elephants, monkeys and wild boars. The other main problems faced by paddy farmers were those related to paddy marketing (non-existence of a reasonable price/stable price and high level of involvement of intermediaries), lack of weedicides, low quality and the high cost of available weedicides and non-availability and low quality of available seed paddy, high cost and lack of labour and issues related to irrigation systems such as poor maintenance of irrigation canals, poor water management and pest and disease attacks.

Issues related to inorganic fertilizers were not in the list of main issues of the farmers except those in Kilinochchi and Matara where it was the third and fourth issue respectively.

OFC farmers have listed the following issues among their first three main issues; marketing the harvest, poor quality and expensive seeds, water scarcity, lack of and high cost of labour, pest and disease attacks, non-availability and high cost of machinery, natural disasters such as droughts, crop damages by animals were prominent. Issues related to inorganic fertilizers had been placed at the fourth place by only chilli and maize farmers.

Therefore, farmers face a series of difficulties in cultivations other than the inorganic fertilizer usage requiring a serious focus of the state to sustain farming in the country supported by a better fertilizer subsidy programme.

Fertilizer Imports and Importers

The total requirement of nitrogen/urea and potassium/muriate of potash and nearly 82 percent of the phosphorus/triple super phosphate requirement imported to the country. The total quantity of fertilizers imported was generally static from 2012 to 2015. However, with the introduction of the Fertilizer Cash Grant Programme, the imported solid fertilizer quantity in 2016 had decreased by 32 percent compared to that of the previous year, 2015 and it had declined by another 11 percent in 2017. Other than the change in the programme, the drought conditions which prevailed since 2016 followed by decreased cultivation extents might have also led to less fertilizer imports.

State-owned fertilizer importing companies (Ceylon Fertilizer Company Limited and Colombo Commercial Fertilizers Limited) had played a dominant role from 2012 to 2015. However, with the change of the programme since 2016 the involvement of the state-owned companies in importing fertilizers had significantly declined and it was only 11 percent and five percent of the total imports in 2016 and 2017 respectively.

Government Expenditure on the Subsidy, Number of Farmers Assisted and Average Paddy Production

With the transition to the Fertilizer Cash Grant Programme in 2016, the government was able to save Rs.21,304 million which is a 43 percent reduction in the government expenditure and 47 percent decline in the state expenditure as a percentage of GDP compared to that of the previous year, 2015. However, the drought conditions that prevailed in the major paddy growing regions in Sri Lanka in 2016 also contributed to these reductions other than the change in the programme. Further, it was a 33 percent reduction in expenditure and 44 percent decline in the government expenditure as a percentage of GDP in 2017 compared to that of 2015. Therefore, the burden on the government in implementing the fertilizer subsidy has eased significantly.

At the same time, one of the advantages of the FCG programme is the needlessness for further loans to implement the subsidy programme as the loans were from state banks before 2016 and accumulated interests are still outstanding. Data shows that 52 and 63 percent of the total expenditure of the fertilizer programme in 2016 and 2017 respectively were on loan and interests accumulated.

Data shows that there was no significant change in the number of paddy farmers assisted through the subsidy programme with the change in the programme in 2016. At the same time, with respect to the national level data, there was no evidence of

substantial changes in the usage of inorganic fertilizer or the production in paddy cultivation after 2016.

9.3 Conclusion

From the findings it can be confirmed that the majority of farmers were of the view that fertilizer related factors have not resulted in either increasing or decreasing the paddy or OFC land extents cultivated or paddy and OFC harvests following the introduction of the FCG programme. National level data also shows that production has not changed significantly resultant on the FCG programme. Misuse of the grant was not observed at significant levels in the sample studied. However, implementation errors of the programme such as insufficient grant, delay in providing the grant and fertilizer not being available at the market at the required time have resulted in changes in the usage of inorganic fertilizer and in the cost of cultivation. At the same time, farmers did not accept or reject the previous programme or the FCG programme strongly though the latter programme had many shortfalls in implementation. Further, the burden on the government in implementing the fertilizer subsidy has eased considerably. Officials who implemented the programme have expressed that they can perform their responsibilities with much ease, attention and with high accuracy and transparency. The Fertilizer Cash Grant Programme facilitated the implementation with less time and corruption at a low level.

Hence, it can be concluded that the Fertilizer Cash Grant Programme is a desirable mechanism which benefits all the stakeholders, farmers, the government and implementing officials and it helps minimize the negative environmental hazards as well compared to the programme implemented from 2005-2015. However, the programme should be implemented devoid of implementing errors to derive the full benefits of the programme.

At the same time, it should also be considered that these results are with respect to only three consecutive seasons of 2016 *Yala*, 2016/17 *Maha* and 2017 *Yala* and in most of the areas the seasons failed due to drought condition in the country. Therefore, in order to have results which reflect the real situation, information in connection with at least five successful seasons needs to be collected.

Other than the inorganic fertilizer usage farmers face a lot of difficulties. Therefore, the government should pay adequate attention to sustain the farming in the country while implementing an effective fertilizer subsidy programme.

9.4 Recommendations

Policies

Voters in a democracy cast their votes for a set of policies that respond to their interests. In that case, agricultural policies should be high on political agendas in countries where the majority live in rural areas and depend on agriculture for a living. But, in general, policymakers pay scant attention to technical viability of the policies but are more concerned about their potential to deliver desired electoral outcomes that make them thrive in power.

However, adhoc changes in policies can create disincentives in agriculture production than incentives. Therefore, changing policies should be implemented with recommendations after a proper assessment in a scientific background. On the other hand, limited and incomprehensive research could result in ineffectiveness of policy. Further, interests, views and demands of all the possible stakeholders should find a crucial place in policy formulation. Thereafter, policymakers should weigh pros and cons of options available before making a decision. Finally, the policies that are economically beneficial and balanced may be the best path forward.

On the other hand, the policies should not be changed frequently as it would take a longer time to yield the projected results. Therefore, implementing a policy at least for three to five consecutive years is prudent. Further, the time can vary with the nature of the policy and the locality of implementation.

Fertilizer Subsidy Programmes

Policies often fail because of inconsistencies in the design and the ground realities. Further, emphasis should be made on sustainability as a goal when designing interventions. Costly, ineffective and inappropriate design and implementations could consume large amounts of scarce government and national resources for little gain while resulting in numerous negative implications. On the other hand, the fertilizer subsidy policy design and implementation should be integrated with other policies for increasing agricultural productivity and rural development.

Therefore, the following aspects should be considered with due attention to design an effective subsidy programme.

- i. Focus: With emphasis on both consumer and producer gains. Product focus could be staple foods, cash crops, etc. Further, it should be remembered that subsidies targeting particular crops may reduce output of other food crops reducing the net food supply response.

- ii. Scale: Programme should be affordable and efficient. Funds should not crowd out critical complementary investments. When calculating the cost of the subsidy programme, the cost of acquiring the fertilizer and the full economic cost of implementing the fertilizer subsidy programme including not only the economic costs but also environmental costs should be considered.
- iii. Effective targeting: Geographical or household approaches could be applied. Well-targeted subsidy schemes are extremely difficult to achieve. Therefore, a clearer targeting policy should be there.
- iv. Entitlement systems and subsidy per beneficiary: Secured entitlement systems should be used to reduce fraud. Attention should be paid to distribution and input access systems and timing.
- v. Logistical systems: Major investments are needed to build human and physical capacity for development and operation of the programme.
- vi. Input supply system development: There should be a proper understanding on roles and timing of different public sector and commercial stakeholders and for institutions.
- vii. Performance monitoring, information and audit systems: Effective monitoring, evaluation and audit systems and cost benefit and fiscal efficiency analysis should be conducted at regular intervals at different levels of the programme. In addition, attention should be paid to possible problems of displacement and leakages.
- viii. Fertilizer use efficiency: Increase fertilizer use efficiency by promoting farmers' use of improved crop management practices, improved soil organic matter, early planting, timely weeding, applying fertilizer in response to rainfall, water harvesting and other conservation farming methods. On the other hand, empower farmers to make decisions about soil fertility management. For that, farmers should be made aware of the benefits of organic and inorganic fertilizers, site-specific nutrient management, balanced fertilization, soil properties, crop diversification that enhances soil fertility etc.
- ix. Complementary policies and investments: Attention should be paid to infrastructure development of complementary services such as extension, seed supply etc, staple market development and stability, agricultural research and economic diversification in rural areas.
- x. Stability of policies: There should be plans for marketing and storage especially during times of excess production.

In addition, the following lessons learnt from the Fertilizer Cash Grant Programme also should be considered in designing an effective programme.

Lessons Learnt from the Fertilizer Cash Grant Programme

The lessons learnt are made in relation to the following themes, the grant, the fertilizer, implementers and database and institutional set-up.

The Grant

- i. Should be provided ***on time*** when it is required. At the same time, different districts have different timeframes in cultivation; therefore district plans rather than a national plan should be made. On the other hand, there should not be any universal timeframe for the entire country when conducting the grant. The timeframe should be developed based on the specific conditions of each district. The authority to release the grant to farmers can be given to the District Secretary or the District Committee on Fertilizers. Thus, for each district, its respective quota can be allocated.
- ii. Assurance on the ***adequacy*** of the grant to get the required amount of fertilizer. Both the fertilizer recommendation and the respective irrigation scheme should be considered for that. It is desirable to consider the fertilizer recommendations made by the Department of Agriculture recently for the ASCs and the prices of fertilizers at the open market.
- iii. Ensure that the ***deserving farmer*** gets the benefit. Since the tenant farmer could be manipulated by the land owner, a mechanism should be introduced to protect the leased and tenant farmers. Legally, there should be certain means for the cultivator to obtain the grant; simultaneously, having the right to obtain the grant should not allow the cultivator to own the land.
- iv. The grant should ***not be restricted to only a few OFCs***. Simply, the OFCs for which the grant is applied should be based on cultivation patterns in each district.

The Fertilizer

- i. Certainty of the availability of fertilizer at the market, especially, in high demanding periods of the year.
- ii. Ensure the quality of fertilizer available in the market by different brand names.

Implementers

- i. Staff shortage, limited infrastructure facilities to work with, less knowledge and competencies among grass root level staff members need to be addressed to with much attention.

- ii. Technological facilities should be improved not only at the ASCs, but also, at the Department of Agrarian Development and the Fertilizer Secretariat in each district.
- iii. Implementing officers such as ARPAs and DOs should be given required theoretical knowledge, practical and attitude-developing training.
- iv. Delays in circulating relevant Circulars and unrealistic targets should be avoided.
- v. Ensure that Circulars are clearer as certain definitions in some Circulars are beyond comprehension and lack clarity. Also, there are repetitions in the Circulars.
- vi. After each season, post-evaluation of the programme should be conducted by Assistant Directors (Fertilizer).

Database and Institutional Set-up

- i. Databases of the programme should be improved by detecting the errors automatically when errors occur at the time of uploading the data, there should be feedback on approved lists, rejected lists and the reasons for rejections immediately after uploading the data. There should be a mechanism to check whether farmers received the grant after uploading the data and proper coordination at the national level to identify the system errors and to correct them.
- ii. Make new initiatives for more interaction between the Agrarian Services Centres and the farmers.
- iii. A new alternative is needed as the income sources of ASCs are limited and there should be some benefits for the Agrarian Services Centres.
- iv. A mechanism should be developed to get the farmer participation for common activities as there are limited interactions between Farmer Organisations and farmers. This can foster unity among farmers.

Other Important Aspects

- i. Farmers should be allowed to meet the officers at the district offices (e.g., Divisional Secretariat) and the ASC at least once a year to discuss their farming issues.
- ii. Make sufficient financial allocations to research and development and infrastructure as they would provide higher returns to agricultural growth and poverty reduction.
- iii. Moreover, measures should be taken to reduce post-harvest losses through better storage, transportation techniques and adopting best practices in post-harvest handling. A sharper focus is needed on other productivity enhancing mechanisms such as crop rotation, water management and crop-livestock integration. In addition, enhanced focus

in ensuring that farm products supply is compatible with market demand to ensure enhanced income levels to farmers. Developing derivative products for agricultural goods must also be considered to reduce price uncertainties faced by farmers. The shift towards market oriented agriculture will help strengthen the financial condition of farmers and generate higher productivity levels in the sector.

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