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IMPACT OF NATIONAL FOOD SECURITY MISSION (NFSM) ON INPUT USE, PRODUCTION, PRODUCTIVITY AND INCOME IN ASSAM

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PREFACE

The present study entitled, "Impact of National Food Security Mission (NFSM) on Input use, Production, Productivity and Income in Assam" was undertaken at the instance of the Ministry of Agriculture, Government of India.

The NFSM was launched in 2007-08 by the Ministry of Agriculture, Government of India, with the purpose of enhancing the production of rice, wheat and pulses by 10, 8 and 2 million tonnes, respectively by the end of the Eleventh Plan (2011-12). The major objective of this scheme is to increase production and productivity of wheat, rice and pulses on a sustainable basis so as to ensure food security of the country. Accordingly, like other States in India, NFSM-rice was launched in Assam in 2007-08 covering 13 districts of the state. The objectives of the scheme were- i) Increasing production of rice through increase in area and productivity ii) Restoring soil fertility and productivity at individual farm level iii) Enhancing farm level economy to restore confidence among the farmers and iv) Creation of employment opportunities. In Assam, NFSM- pulses was launched in 2010-11 targeting the districts where area under pulses is more but productivity is comparatively lower. The scheme covered 10 districts of the state.

The study comprised 300 NFSM beneficiaries and 100 Non-beneficiary respondents of Nagaon and Tinsukia districts in Assam. The finding of the study show that NFSM programme has helped the beneficiary farmers in raising their crop productivity and income from crop cultivation.

I am grateful to Dr. Parmod Kumar and Dr. A.V. Manjunatha, Co-ordinators of the study, Agricultural Development and Rural Transformation Centre, Institute for Social and Economic Change, Bangalore, for guiding our research team all throughout the study and giving valuable comments on the draft report which have duly been incorporated. I am also grateful to the officials of the State Government Departments for their sincere help and cooperation during the study. Special mention, in this context may be made of the District Agricultural Officers of Tinsukia and Nagaon district of Assam. I profusely thank all the sample respondents for their genuine interest and cooperation during the field surveys.

Like all the studies, this study is also a joint output of the Centre. I am grateful to Mrs. Runjun Savapandit and Dr. Gautam Kakaty who prepared the report of the study. I am also thankful to Dr. Jotin Bordoloi of the Centre for his assistance in Statistical analysis required in this study. The names of the research staff associated with the study have been mentioned elsewhere in the report.

I hope that the results of the study will be useful for the planners, policy makers and researchers.

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CONTENTS

List of Tables

List of Figures & Charts

List of Abbreviations

AAGR	-	Annual Average Growth rate
AGR	-	Annual Growth Rate
AFCL	-	Agricultural Finance Corporation Limited
ASMO	-	Area Sown More than Once
AV.	-	Average
FCI	-	Food Corporation of India
FFS	-	Farmers Field School
GAP	-	Good Agricultural Practices
GCA	-	Gross Cropped Area
GDP	-	Gross Domestic Product
GIA	-	Gross Irrigated area
GIS	-	Geographical Information System
GOI	-	Government of India
ha.	-	hectare
HYV	-	High Yielding Variety
Kg.	-	Kilogram
INM	-	Integrated Nutrient Management
IPM	-	Integrated Pest Management
KVK	-	Krishi Vigyan Kendra
mha.	-	Million hectares
mt.	-	Metric tonnes
NABARD	-	National Bank for Agriculture and Rural Development
NAFED	-	National Agricultural Cooperative Marketing Federation
NCA	-	Net Cropped area
NERAMAC	-	North Eastern Regional Agricultural Marketing Corporation Ltd.
NFSM	-	National Food Security Mission
NIA	-	Net Irrigated Area
NSA	-	Net Sown Area
Qtls.	-	Quintals
RKVY	-	Rashtriya Kishi Vikas Yojana
SRR	-	Seed Replacement Rate
Y	-	Yield

Chapter – I

Introduction

1. 1 Introduction:

Agriculture sector is enormously important for the Indian economy as the sector is contributing 14 per cent of the nation's GDP, 11 per cent of its exports and about half of the population still depends on agriculture as its primary source of income ,while it provides raw material for a large number of industries (Economic Survey 2012-13,GOI). The experience of last three decades indicate that the growth rate of food -grains production decreased from 2.93 per cent during the period 1986-97 to 0.93 per cent during 1996-2008. The declining growth of food grains production was partly contributed by the decline in area but largely by the decline in yield rate. The yield of foodgrains growth rate decreased from 3.21 per cent to 1.04 per cent during the same time period. There was also decline in growth in the production of other agricultural commodities. This is clearly reflected in the decelerated agriculture growth from 3.5 per cent during the period 1981-82 to 1996-97 to around 2 per cent during 1997-98 to 2004-05. Nevertheless, there have been signs of improvement during the recent years (Dev and Sharma, 2010; Kumar, 2013 and GOI, 2012-13). The resilience of Indian agriculture is evident in that this sector last posted negative growth in 2002-03 and has registered a remarkable average growth rate of 4.1 per cent during the Eleventh Five Year Plan (2007-08 to 2011-12). As per the PE for 2013-14, growth rate of agriculture GDP was 1.4 per cent and 4.7 per cent respectively, during the first two years of the Twelfth Plan period (Economic Survey, 2013-14, GOI). The U-turn in agricultural production occurred mainly due to the implementation of important programmes, such as Rastriya Krishi Vikas Yojana (RKVY), National Food Security Mission (NFSM), National Horticultural Mission (NHM), various sub-schemes and substantial increase in state outlay on agriculture (GOI, 2012-13, Kumar, 2013).

Table-1.1 below gives a list of various agricultural schemes and programmes undertaken by the Government of India since 1960 to improve the agricultural situation in the country. The programmes focus on a variety of aspects relating to enhancing agricultural productivity of a range of food grains and oilseeds, together with providing the

farmer the tools (easy accessibility to credit, extension services *etc.*) to help him execute the schemes and benefit from them.

Table 1.1

Various Agricultural Programmes Initiated by the Government of India

Sl. No.	Agricultural Development Programme	Year of Beginning	Objective/Description
1	Intensive Agriculture Development Program (IADP)	1960	To provide loan, seeds, fertilizer tools to the farmers.
2	Intensive Agriculture Area Program (IAAP)	1964	To develop the special harvest.
3	High Yielding Variety Program (HYVP) 'Green Revolution'	1966	To increase productivity of food grains by adopting latest varieties of inputs for crops.
4	Nationalization of 14 banks	1969	To provide loans for agriculture, rural development and other priority sector.
5	Marginal Farmer and Agriculture Labour Agency (MFALA)	1973	For technical and financial assistance to marginal and small farmer and agricultural labour.
6	Small Farmer Development Agency (SFDA)	1974	For technical and financial assistance to small farmers.
7	Minikit Programme for rice, wheat & coarse cereals	1974	To increase the productivity by popularising the use of newly released hybrid/high yielding varieties and spread the area coverage under location specific high yielding varieties/hybrids.
8	Coconut Development Board	1981	To increase production and productivity of coconut and bring additional area under coconut in potential non-traditional areas.
9	Farmer Agriculture Service Centres (FASC)	1983	To popularize the use of improved agricultural instruments and tool kits.
10	Watershed Development Council (WDC)	1983	Central Sector Scheme(HQ Scheme)
11	National Oilseeds and Vegetable Oils development Board (NOVOD)	1984	It covers the entire gamut of activities - production, marketing, trade, storage, processing, research and development, financing and advisory role to the formulation of integrated policy and programme of development of oil seeds and vegetable oil.
12	Comprehensive Crop Insurance Scheme	1985	For insurance of agricultural crops.
13	National Pulses Development Project (NPDP)	1986	To increase the production of pulses in the country to achieve self sufficiency.
14	Agricultural and Rural Debt Relief Scheme (ARDRS)	1990	To exempt bank loans up to Rs. 10,000 of rural artisans and weaver.
15	Oil Palm Development Programme (OPDP)	1992	To promote oil palm cultivation in the country.
16	Accelerated Maize Development Programme (AMDP)	1995	To increase maize production and productivity in the country from 10 million tonnes to 11.44 million tonnes and from 1.50 tonnes/hectare to 1.80 tonnes/hectare respectively up to the

			terminal year of 9th Plan i.e. 2001-2002 (revised).
Sl. No.	Agricultural Development Programme	Year of Beginning	Objective/Description
17	Intensive Cotton Development Programme (ICDP)	2000	To enhance the production, per unit area through (a) technology transfer, (b) supply of quality seeds, (c) elevating IPM activities/ and (d) providing adequate and timely supply of inputs to the farmers .
18	Agricultural Technology Management Agencies (ATMA)	2005	To make the extension system farmer driven as well as accountable to farmers by providing for new institutional arrangements for technology dissemination.
19	Rashtriya Krishi Vikas Yojana (RKVY)	2007	Incentivizing states to enhance public investment to achieve 4 per cent growth rate in agriculture and allied sectors during the Eleventh Five Year Plan period
20	National Food Security Mission (NFSM)	2007	Aims at producing an additional 8 million tonnes of wheat, 10 million tonnes of rice and 2 million tonnes of pulses over the base year (triennium ending 2006-07) by 2011-12.
	National Mission for Sustainable Agriculture (NMSA)	2010	To enhance food security and protection of resources such as land, water, biodiversity and genetic resources by developing strategies to make Indian agriculture more resilient to climate change.
22	Bringing Green Revolution to Eastern India (BGREI)	2010-11	This programme is being implemented under RKVY in the states of Assam, Bihar, Chhattisgarh, Jharkhand, Odisha, Eastern Uttar Pradesh and West Bengal since 2010–11 to harness the potential of Eastern Indian Plains for enhancing Agricultural Production.

services *etc.*) to help him execute the schemes and benefit from them.

1.1.1 The Genesis of NFSM

In view of the stagnating food-grains production and an increasing consumption need of the growing population, the National Development Council (NDC) in its 53rd meeting held on 29th May, 2007 adopted a resolution to launch a Food Security Mission comprising rice, wheat and pulses to increase the annual production of rice by 10 million tons, wheat by 8 million tons and pulses by 2 million tons by the end of the Eleventh Plan (2011-12). Accordingly, a Centrally Sponsored Scheme, 'National Food Security Mission' (NFSM),

was launched in October 2007.The Mission met with an overwhelming success and achieved the targeted additional production of rice, wheat and pulses.

The major objective of this scheme is to increase production and productivity of wheat, rice and pulses on a sustainable basis so as to ensure food security of the country. The approach is to bridge the yield gap in respect of these crops through dissemination of improved technologies and farm management practices.

The specific interventions of NFSM are given in Table 1.2.

Table-1.2
Interventions Implemented under NFSM - Rice, Wheat and Pulses

S. No.	Rice	Pulses	Wheat
1	Demonstrations on Improved Package of Practices	Seed	Demonstrations on Improved Package
		(i) Purchase of Breeder Seeds of Pulses from ICAR.	
		(ii) Production of Foundation Seeds.	
		(iii) Production of Certified Seeds.	
		(iv) Distribution of Certified Seeds.	
		(v) Strengthening of State Seed Certification Agency.	
2	Demonstrations on System of Rice Intensification.	Organisation of technology Demonstrations	Increase in SRR (Seed Distribution)
3	Demonstrations on Hybrid Rice Technology.	Frontline Demonstration of Pulses	Distribution of Seed Minikit of HYVs of Wheat.
4	Support for Promotion of Hybrid Rice Seed:	Integrated Nutrient Management	Incentive for Micro-nutrients.
	(a) Assistance for Production of Hybrid Rice Seed.	(a) Lime/Gypsum	
		(b) Micro-nutrients.	
	(b) Assistance for Distribution of Hybrid Rice Seed.	(c) Assistance for Rizobium Culture/Phosphate Solubizing bacteria distribution.	
5	Assistance for Distribution of HYVs Seeds.	Integrated Pest Management (IPM)	Incentive for Gypsum (Salt affected soils)
6	Seed Minikits of Rice: (a) HYVs (b) Hybrids	Assistance for Distribution of NPV	Incentive Zero Till Seed Drills
7	Incentive for Micro-nutrients	Assistance for Distribution of PP Chemicals	Incentive on Rotavators
8	Incentive for Liming in Acidic Soils	Assistance for Weedicides	Incentive on Multi-crop Planters
9	Assistance for Plant Protection Chemicals and bioagents	Incentive for Knap Sack Sprayers	Incentive on Seed Drills

10	Incentive for Cono-weeders & other implements	Distribution of Zero Till Seed Drills	Incentive for Sprinkler Sets
11	Incentive on Knap Sack Sprayers	Distribution of Multi crop planters	Incentive on Knap sack Sprayers
12	Incentive Zero Till Seed Drills	Distribution of Seed Drills.	Incentives for Diesel Pump sets.
13	Incentive on Multi-Crop Planters.	Distribution of Rotavators	Pilot Project on Community Generators
14	Incentive on Seed Drills	Distribution of Sprinkler Sets	Farmers Trainings
15	Incentive on power Weeders	Incentive for Pump sets	International Exposure visit of Technical Staff
16	Incentive on Rotavators	Assistance for Pipe for carrying water from source to the field	Award for Best Performing Districts.
17	Incentive for Pump sets	Extension, Training including Award for Best Performing District	Miscellaneous Expense:
		(i) Training on Pattern of FFS	(a) Project Management Team & other Misc. expenses at District Level.
		(ii) State Level Trainings for Trainers	(b) Project Management Team &
		(iii) Award for Best Performing District	other Misc. expenses at State Level
18	Farmers Trainings	Local Initiatives	Local Initiatives (Activity wise)
19	Award of Best Performing Districts	Miscellaneous Expenses relating to PMT including contractual services, Pol and other expenses.	
		(a) District Level (Existing NFSM Districts)	
		(b) State Level	
		(c) Misc. Expenses to State for other Districts	
20	Miscellaneous Expense:		
	(a) Project Management Team & other Misc. expenses at District Level.		
	(b) Project Management Team & other Misc. expenses at State Level		
21	Local Initiatives (Activity wise)		
	(a) Global Gap/Organic Certification		

***Source**: T ,Haque & Ankita Goyal (2013): "Role of National Food Security Mission (NFSM) in improving agricultural productivity in selected districts" Council for Social Development(CSD), New Delhi.*

The above interventions were almost same for Assam which has been incorporated in Chapter II. The interventions under the NFSM to achieve the main objective of

increasing production of rice, wheat and pulses have been so formulated that it amalgamates the proven technological components covering seeds of improved variety, soil ameliorants, plant nutrients, farm machines/implements and plant protection measures. The Mission initially covered a total of 312 districts of 17 states. Over the Plan period, a number of other Districts and States were included under the three crops envisaged in the scheme, *viz.* rice, wheat and pulses and since 2010-11, the Mission covers a total of 480 districts of 18 states which comprises of 142 districts of rice in 14 states, 142 districts of wheat in 9 states and 468 districts of pulses in 16 states. According to the requirements of different crops, component-wise separate interventions as well as budgets are advanced by the Mission.

Table1.3 shows year-wise financial targets and achievements in the Eleventh Plan for the crop components of the NFSM in Assam and India.

Table-1.3
Financial Targets and Achievements in NFSM Components in the Eleventh Plan in India and Assam

Crops	Financial Targets & Achievement	2007-08	2008-09	2009-10	2010-11	2011-12	Total XI Plan
Rice	Targets (T)	5950.60 (1167.06)	38210. 50 (3262.65)	46486.60 (4235.82)	43380.80 (5914.84)	35485.10 (2491.03)	169513.60 (17071.4)
	Achievements (A)	1950. 30 (275.46)	22542. 20 (3041.42)	33865.10 (4107.01)	30393.20 (2850.99)	32822.60 (5523.84)	121573.40 (15798.72)
	A as per cent of T	32. 80 (23.60)	59. 00 (93.22)	72.80 (96.96)	70. 10 (48.20)	92. 50 (221.75)	71. 70 (92.54)
Wheat	Targets (T)	20709. 30	33068. 90	42202. 80	33050. 40	31758. 20	160789. 70
	Achievements (A)	10129. 50	24402. 00	36986. 30	26930. 10	24022. 20	122470. 10
	A as per cent of T	48. 90	73. 80	87. 60	81. 50	75. 60	76. 20
Pulses	Targets (T)	10463. 30	37587. 10	53546. 40	48213.00 (914.21)	42845.80 (864.71)	192655.60 (1778.92)
	Achievements (A)	3648. 70	24266. 10	40070. 20	36068.40 (657.11)	37124.00 (749.71)	141177.30 (1406.82)
	A as per cent of T	34. 90	64. 60	74. 80	74. 80 (71.88)	86. 60 (86.70)	73. 30 (79.08)

***Source**: T .Haque & Ankita Goyal (2013): "Role of National Food Security Mission (NFSM) in improving agricultural productivity in selected districts" Council for Social Development(CSD), New Delhi.*

Note: The parentheses figures indicate targets and achievement for the crop components (rice & pulses) of the NFSM in Assam in the eleventh plan. The NFSM programme did not touch wheat but in case of pulses, the programme started from 2010-11 onwards.

The target of producing additional 20 million tonnes of food crops in India was fixed for 11th Five Year Plan and was achieved for all the crops which were included under NFSM. The details of increase in production over two consecutive five year plans have been given in table below (Table-1.4).

Table-1.4

Details of increase in production over two consecutive Five Year Plans

(In million tonnes)

Crop	2006-07 (Pre-NFSM Year)	Target fixed for additional Production during XI Plan)	2011-12 (Terminal year of XI Plan)	Increase over 11th plan average
Rice	93. 36	10	105. 30	11. 94
Wheat	75. 81	8	94. 88	19. 07
Pulses	14. 20	2	17. 09	2. 89
Total food -grains	217. 28	20	259. 29	42. 01

***Source**: Sandhu, J. S, S. Lohiya & D. P. Malik(2014) "Impact Evaluation Studies of Technical Component of National Food Security Mission (NFSM)-II" Government of India, Ministry of Agriculture, Department of Agriculture & Cooperation, Krishi Bhawan, New Delhi.*

1. 1. 2 Major Components of NFSM:

NFSM comprised of three components during the XI Plan

(i) National Food Security Mission – Rice (NFSM-Rice)

(ii) National Food Security Mission – Wheat (NFSM-Wheat)

(iii) National Food Security Mission – Pulses (NFSM-Pulses)

The total financial implication for the NFSM was Rs. 4882.48 crores during the Plan period (2007-08 – 2011-12).

As per operational guidelines of National Food Security Mission during the 12th Five Year Plan, NFSM is covering five components (i) NFSM- Rice; (ii) NFSM-Wheat; (iii) NFSM-Pulses, (iv) NFSM- Coarse cereals and (v) NFSM-Commercial Crops.

The Mission is being continued in the 12th Five Year Plan as well, with new targets of additional production of 25 million tons of food grains comprising of 10 million tons rice, 8 million tons of wheat, 4 million tons of pulses and 3 million tons of coarse cereals by the end of 12th Five Year Plan. Based on past experience and feedback received from the States, major changes have been made in approach, norms of financial assistance and programme

implementation strategy which are reflected in the revised operational guidelines.

1.1. 3 Organizational Structure of the Mission:

For smooth functioning of the Mission, a three tiered make-up is set in place at the National, State and District level as shown in flow chart-1.

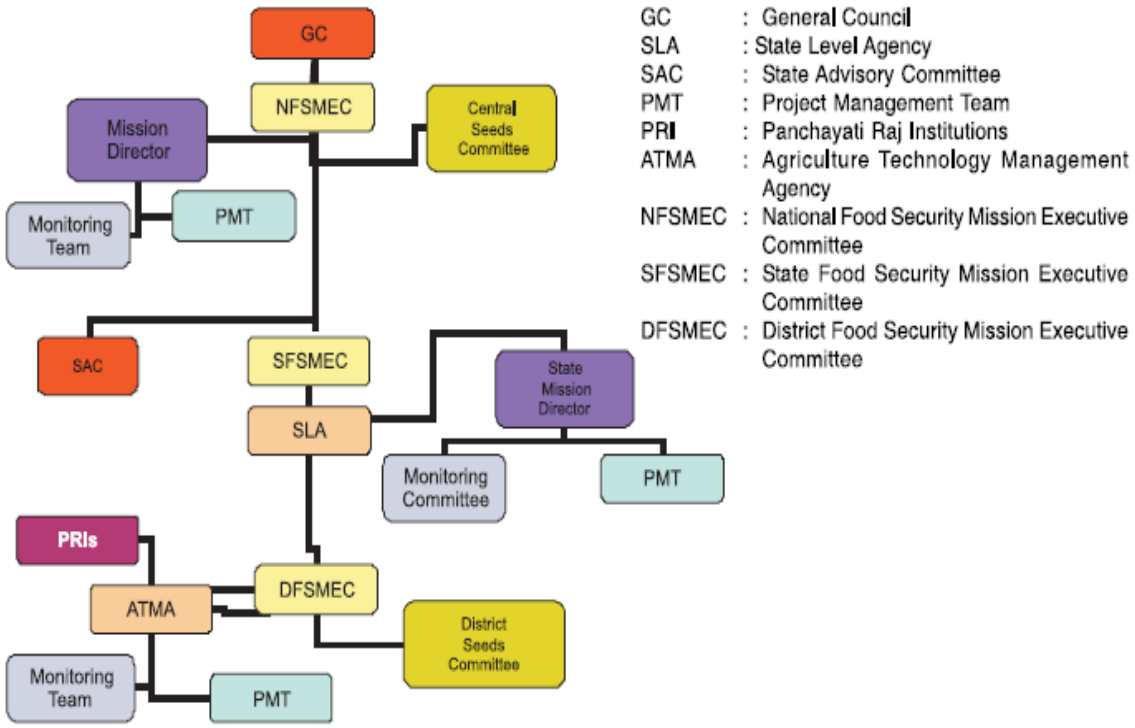


Figure 1. Organizational structure of NFSM

***Source**: T .Haque & Ankita Goyal (2013): "Role of National Food Security Mission (NFSM) in improving agricultural productivity in selected districts" Council for Social Development(CSD), New Delhi*

1.1.4 Review of Literature

Government of India in its agricultural annual report (2010-11) stated that through new farm practices under NFSM, nearly 50 per cent of the rice districts (70 out of 143), 33 per cent of the wheat districts (41 out of 138) and around 50 per cent of pulses districts (74

out of 159) have recorded more than 10 to 20 per cent increase in productivity compared to the base year of 2006-07.

NABARD Consultancy Services (NY) conducted a concurrent evaluation of NFSM by comparing NFSM and non-NFSM districts in Rajasthan considering current year and the base year (2006-07). It was found from the study that there was an excellent growth in NFSM pulses districts with 57, 134 and 49 per cent growth in total sown area, production and productivity, respectively. In non-NFSM pulses districts, all three measures *viz.* area, production and productivity had decreased by 20,101 and 68 per cent, respectively. Even though the non-NFSM districts have better irrigation sources than the NFSM districts, the yield in NFSM districts was generally higher.

Agricultural Finance Corporation Limited (AFCL) in 2012 conducted mid-term evaluation of NFSM by selecting 17 states, 136 districts and 232 blocks common for all the 3 components *i.e.,* rice, wheat and pulses. The study concluded that NFSM-Rice districts recorded yield gain of about two times and five times more than the non-NFSM districts during 2007-08 and 2008-09, respectively. The productivity of wheat in non-NFSM districts had better yield gain of 3.91 per cent in 2007-08 as compared to the 3 per cent increase in NFSM Districts. The productivity of wheat in NFSM districts improved at 7.91 per cent and 12.87 per cent during 2008-09 and 2009-10, while the corresponding figures were 7.09 per cent and zero per cent in non- NFSM districts, respectively. In the year 2007-08, the non-NFSM pulses districts had recorded better yield by 1.14 per cent over the base year of 2006-07 compared to an increase of 0.99 per cent in NFSM districts. In the consecutive year 2008-09, NFSM districts showed improved performance by registering yield of 8.26 per cent as against 6.99 per cent in non-NFSM districts.

AFC India Ltd. conducted a study in 2014 on "Impact Evaluation of National Food Security Mission" and concluded that the Mission has helped in widening the food basket of the country with sizeable contributions coming from the NFSM districts. The focused and target oriented implementation of mission initiatives has resulted in bumper production of rice, wheat and pulses. The production of wheat has increased from 75.81 million tonnes in pre-NFSM year of 2006-07 to 94.88 million tonnes during 2011-12 *i.e.* an increase of nearly 19 million tonnes against the envisaged target of 8 million tonnes at the end of XI Plan period. Similarly, the total production of rice has increased from 93.36 million tonnes in pre–NFSM

year of 2006-07 to 105.31 million tonnes in 2011-12 with an increase of nearly 12 million tonnes against the target of 10 million tonnes. The total production of pulses has also increased from 14.20 million tonnes during 2006-07 to 17.09 million tonnes during 2011-12 with an increase of about 3 million tonnes against the envisaged target of 2 million tonnes. Thus, 34 million tonnes of additional production of total food-grains against the target of 20 million tones were achieved at the end of 11th five year plan. The Mission has also been successful in achieving its objective of vertical growth by raising the productivity per unit of land.

1. 2 Background of NFSM in the state of Assam:

NFSM-rice was launched in Assam in 2007-08 covering 13 districts of the state. The objectives of the scheme are- i) Increasing production of rice through increase in area and productivity ii) Restoring soil fertility and productivity at individual farm level iii) Enhancing farm level economy to restore confidence among the farmers and iv) Creation of employment opportunities.

The area of rice covered under this programme in 13 districts is shown in Table-1.5 below.

Table: 1. 5
District-wise Area under NFSM Rice in Assam

Sl No	Districts	Area (000 ha)					
		2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
1.	Barpeta	104. 21	164. 34	174. 00	166. 88	156. 35	124. 76
2.	Bongaigaon	66. 05	68. 44	66. 09	62. 16	61. 87	58. 85
3.	Darrang	58. 69	73. 64	80. 29	86. 05	78. 81	75. 42
4.	Dhemaji	74. 41	72. 19	72. 97	77. 95	77. 58	78. 83
5.	Goalpara	78. 40	83. 31	82. 63	83. 87	75. 82	81. 74
6.	Karbi Anglong	122. 71	125. 90	126. 39	127. 82	119. 94	126. 51
7.	Kokrajhar	108. 48	104. 60	104. 36	110. 45	104. 80	108. 10
8.	Lakhimpur	121. 64	123. 60	137. 61	142. 21	148. 62	143. 40
9.	Marigaon	84. 03	76. 73	78. 95	90. 64	89. 30	80. 55
10.	Nagaon	192. 61	195. 20	183. 90	185. 91	189. 82	110. 91
11.	Nalbari	80. 50	80. 35	77. 75	77. 07	78. 68	80. 00
12.	Sonitpur	167. 08	173. 39	158. 41	170. 16	170. 56	160. 78
13	Tinsukia	62. 86	65. 73	67. 49	65. 52	68. 27	58. 17
	Total	1321. 66	1407. 47	1410. 83	1446. 76	1420. 39	1288. 03

Source: *Statistical Handbook of Assam (Relevant Years), Directorate of Economics and Statistics, Government of Assam*

It is evident from Table 1.5 that the total area under rice increased from 1321.66 thousand hectares in 2007-08 to 1446.76 thousand hectares in 2010-11. Again the total area under rice decreased from 1446.76 thousand hectares in 2010-11 to 1420.39 thousand

hectares in 2011-12 and 1288.03 thousand hectares in 2012-13. It may be due to launching of NFSM pulses in 2010-11.

In Assam, National Food Security Mission (NFSM) pulses was launched in 2010-11 targeting the districts where area under pulses is more but productivity is comparatively lower. The scheme covers 10 districts of the state. Accelerated pulses production programme, popularly known as A3p is a sub-scheme of NFSM (pulses).

The objectives of the scheme are –i) Increasing area coverage and productivity of pulses to increase production. ii) Popularising pulses cultivation through demonstration programmes. iii) Enhancing farm income of pulses cultivators through increase in productivity.

Impact of the scheme after 3 years of implementation could be evidenced from a 60 per cent increase in production and 13 per cent increase in productivity of pulses. The increase in area of pulses under this programme in 10 districts of Assam is shown in Table 1.6. The Table-1.6 clearly indicates that the total area under pulses had increased from 67.75 thousand hectares in 2010-11 to 95.31 thousand hectares in 2012-13.

Table: 1. 6
District-wise Area under NFSM Pulses in Assam

Sl No	Districts	Area (000 ha)		
		2010-11	2011-12	2012-13
1.	Baksa	5. 09	6. 03	7. 26
2.	Barpeta	12. 02	15. 48	16. 13
3.	Bongaigaon	3. 98	4. 97	5. 48
4.	Dhubri	7. 97	10. 10	11. 39
5.	Jorhat	9. 34	13. 49	14. 77
6.	Kamrup	5. 56	6. 91	8. 26
7.	Kokrajhar	5. 55	6. 76	7. 09
8.	Nagaon	7. 09	9. 07	10. 05
9.	Sonitpur	7. 08	8. 06	9. 50
10.	Udalguri	4. 10	5. 49	5. 39
	Total	67. 75	86. 34	95. 31

Source: *Statistical Handbook of Assam (Relevant Years), Directorate of Economics and Statistics, Government of Assam*

1. 3 Main objectives and Scope of the study:

Keeping in view of the importance of the subject, the objectives of the present study has been framed as under-

1. To analyse the trends in area, production, productivity of rice and pulses in

the NFSM and non NFSM districts in Assam;

2. To analyse the socio-economic profile of NFSM *vis-a-vis* Non-NFSM beneficiary farmers of rice;
3. To assess the impact of NFSM on input use, production and income among the beneficiary farmers of rice;
4. To identify factors influencing the adoption of major interventions (improved technologies) under NFSM and
5. To identify the constraints hindering the performance of the programme

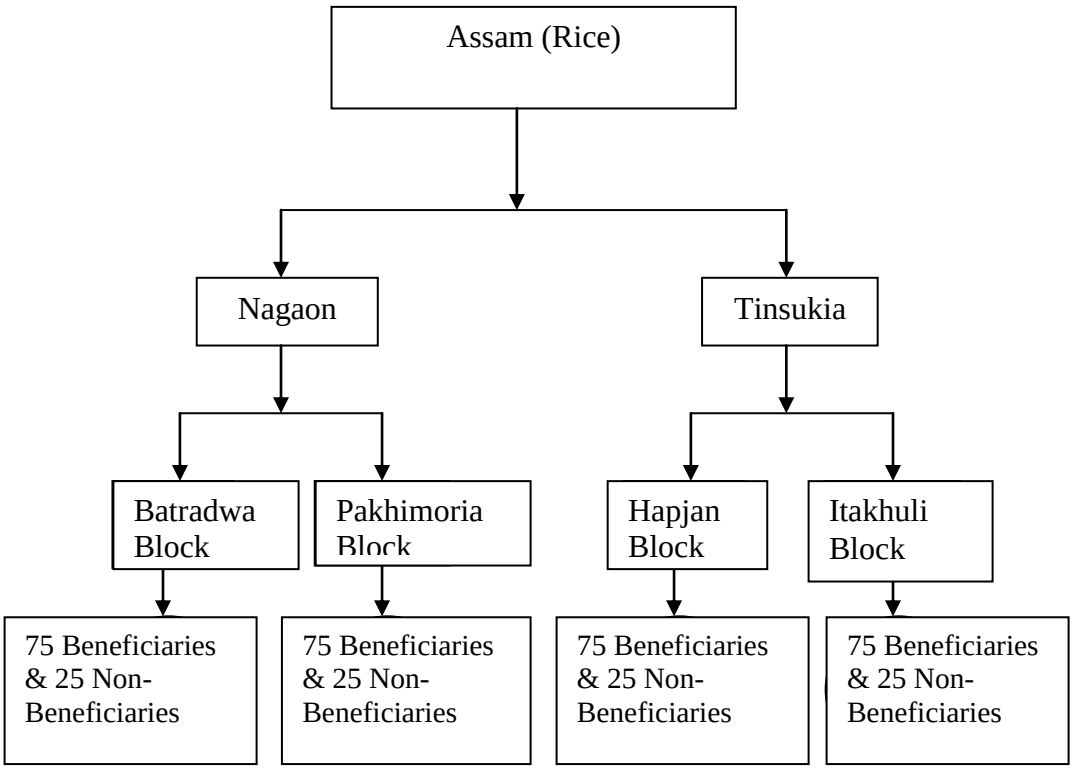
The NFSM is extended to 12th Five Year Plan due to its success in achieving the targeted goal of production enhancement. It is essential to evaluate and measure the extent to which the programme and approach has stood up to the expectations. The study would enlighten the policy makers to incorporate necessary corrective measures to make the programme more effective and successful during the 12th Five Year Plan.

1. 4 Data and Methodology

The study is undertaken in the state of Assam for rice. For the selection of beneficiary and non-beneficiary of NFSM (rice), a multi-stage sampling design was used (Flow chart 2). The study covers two districts *viz.* Nagaon and Tinsukia of the state according to highest and lowest production of rice among the NFSM districts as per methodology of the study. From each district, two blocks were selected, drawing one block from the nearby district headquarters and the second at a distance of 15-20 kilometre from the district headquarters. Subsequently, 75 beneficiaries and 25 non-beneficiaries were selected from each block totalling to a sample size of 200 households. Altogether, 400 households were selected for the study. For the selection of beneficiary households in each block, the beneficiary lists were collected from the District Agriculture Office. After obtaining the beneficiary list, the households were selected in such a way that all the major components were covered under the scheme. The non beneficiary households were selected in the peripheral areas in such a way that a similar cropping pattern and baseline characteristics are represented by the non beneficiary households as well. For meeting the objectives, primary household data were considered. The primary data relating to general information about the sample farmers, socio-economic profiles, cropping pattern, details on various inputs used in paddy cultivation, irrigation details, yield returns, reasons for adoption/non-adoption of

NFSM interventions, constraints faced for availing the benefits, suggestions for improvement, etc. were collected from the sample beneficiary and non beneficiary farmers using a questionnaire prepared by the Coordinating Centre, ISEC, Bangalore. The primary household data were collected mainly pertaining to the agricultural year 2013-14.

Flow chart 2: Multi-stage sampling method for the study



Most of the secondary data and required information, at the national and state levels, on cropped area, irrigated area, yields were collected from the various issues of Economic Survey and Statistical Handbook of Assam published by the Directorate of Economics and Statistics, Government of Assam. Financial progress, target and achievement of NFSM, category wise interventions, outlay and expenditure for the 11th five year plan in Assam etc. were collected from the State Nodal Officer, NFSM, Assam.

To find out the factors influencing the participation of farmers in NFSM, the following logistic Linear Regression Model was applied by taking binary dependent variables 1 for NFSM beneficiary and 0 for non- beneficiary.

The Logistic Regression Model is -

$$\ln \left[\frac{p(x)}{1-p(x)}\right] = \beta_0+\beta_1 x_1+\beta_2 x_2+\cdots\cdots\cdots\beta_n x_n$$

Where,

β_0 = Constant

$\beta_1,\beta_2,\cdots\cdots\cdots,\beta_n$ are the co-efficient of independent variables where,

x_1 = Age

x_2 = Education till Secondary

x_3 = Education Higher Secondary

x_4 =Operational holdings (acre)

x_5 = Family size

x_6 = Caste-ST/SC

X_7 = OBC

x_8 = Others

x_9 =Income from farming

x_{10} = Ratio of Irrigated to the total operational area

x_{11} = Credit availed (per acre)

x_{12} = Farm asset value (Rs.)

1. 5 Structure of the report

The study is divided into six chapters. Chapter- I is the introductory chapter, followed by Chapter- II which represents time series analysis of impact of NFSM on food-grains production in the state. The socio-economic profile of the sample farmers, cropping pattern and production structure are presented in Chapter- III. The findings from the primary data are discussed in Chapter- IV. Factors influencing participation of farmers in NFSM, constraints, suggestions for improvement of NFSM are presented in Chapter -V. The concluding remarks and policy implications are discussed in the last chapter.

***

Chapter II
Impact of NFSM on food-grain production in the state: A time series analysis

2.1 Trend in Area and Input use for food grain crops

In this chapter, an attempt has been made to analyse the impact of NFSM on paddy and pulses based on secondary level data in Assam.

Agriculture in Assam has been playing a very important role in state's economy. Of the total cropped area of the state, the percentage of area under different crops constituted 53.04 per cent of the total geographical area in the year 2010-11.

Rice being the staple food of Assam and hence concentration of area under paddy cultivation is high. The paddy cultivation during the year 2012-13, occupied 88. 5 per cent of the net cropped area and 59.8 per cent of the gross cropped area in the state compared to 90.6 per cent and 61.2 per cent of the net cropped area and the gross cropped area respectively, during the year 2011-12. The dominant crop, paddy is cultivated in three different seasons. Winter season (*Sali),* summer season (*Boro*) and autumn season (*Ahu*). As per final estimates, the average area covered under normal paddy cultivation during the year 2012-13 was 24.88 lakh hectares (about 92.4 per cent of the total area under food grains in the state). The area coverage under pulses in 2012-13 was 1.42 lakh hectares against 1.26 lakh hectares in 2010-11.

Table-2.1 shows the trend in area and fertilizer use in Assam. During 9^{th} plan period average AGR in net irrigated area was estimated at -0.16 per cent while average AGR in 10^{th} plan period was 6.00 per cent and in 11^{th} plan period, average AGR in net irrigated area was found at 13.59 per cent. The average AGR in gross irrigated area was highest (4.30 per cent) during 11^{th} plan period followed by 1.77 per cent during 9^{th} plan period and 1.14 per cent during 10^{th} plan period. The average AGR in net sown area was highest (0.42 per cent) during 11^{th} plan period followed by -0.15 per cent during 10^{th} plan period and -0.02 per cent during 9^{th} plan period. The average AGR in percentage of net irrigated area to net sown area

was also highest during 11th plan period (13.12 per cent) followed by 6.09 per cent during 10th plan period and -0.13 per cent during 9th plan period. The Average AGR in irrigation intensity was highest (11.74 per cent) during 11th plan period followed by 7.99 per cent during 10th

Table 2.1
Trend in Area and Fertilizer Use in Assam

Year	Net irrigated Area (lakh ha)	Gross irrigated Area (lakh ha)	Net sown area (lakh ha)	% net irrigated to net sown area	Irrigation intensity (%)	Cropping Intensity (%)	Fertiliser consumption (Kg/ha of NSA)
1	2	3	4	5	6	7	8
1997-98	1.14	4.81	27.69	4.12	2.85	121.50	25.73
1998-99	1.16	4.83	27.51	4.22	2.94	145.89	28.39
1999-00	1.19	4.93	27.34	4.35	2.91	149.48	40.27
2000-01	1.15	5.04	27.93	4.12	2.81	146.48	50.35
2001-02	1.13	5.16	27.74	4.07	2.84	143.58	55.14
9th Plan Avg. AGR*	**-0.16**	**1.42**	**-0.02**	**-0.13**	**-0.42**	**0.35**	**22.95**
2002-03	0.79	5.20	27.53	2.87	2.00	143.77	63.53
2003-04	0.63	5.31	27.53	2.29	1.59	143.75	68.60
2004-05	0.53	5.31	27.53	1.93	1.36	141.53	60.26
2005-06	0.53	5.35	27.53	1.93	1.34	143.44	71.70
2006-07	1.04	5.46	27.53	3.78	2.76	136.69	73.98
10th Plan Avg. AGR	**6.00**	**1.14**	**-0.15**	**6.09**	**7.99**	**-0.96**	**11.50**
2007-08	0.89	5.96	27.53	3.23	2.26	139.45	81.48
2008-09	0.96	6.02	28.10	3.42	2.40	142.31	80.67
2009-10	1.69	6.27	28.11	6.01	4.12	146.06	85.55
2010-11	1.30	6.48	28.11	4.62	3.13	148.01	88.21
2011-12	1.58	6.73	28.11	5.62	3.85	145.82	98.58
11th Plan Avg. AGR	**13.59**	**4.30**	**0.42**	**13.12**	**11.74**	**1.90**	**6.01**

Source: Directorate of Economics and Statistics, GOI

Note: Column 4 = Net irrigated area /Net sown area*100

Column 6= Gross irrigated area /Gross sown area*100

*Year on year growth rate (Annual Growth Rate) = (Previous year value - Current year value) / Previous year value*100

plan period and -0.42 per cent during 9th plan period. Average AGR in cropping intensity was highest (1.90 per cent) during 11th plan period followed by 0.35 per cent during 9th plan period and -0.96 per cent during 10th plan period. Fertiliser consumption varied from 25.73 kg/ha of NSA to 55.14 kg/ha and the average AGR stood at 22.95 per cent during 9th plan period. During 10th plan period fertiliser consumption varied from 60. 26 kg/ha of NSA to 73.98 kg/ha and the average AGR was reported at 11.50 per cent. In the next plan, the fertiliser consumption was 81.48 kg/ha for the year 2007-08 and it was increased to98.58 kg/ha in the year 2011-12. The average AGR stood at 6.01 per cent of NSA for the entire plan period.

It is seen from the Table-2.1 that after launching of the NFSM in 2007, irrigation intensity, cropping intensity and fertiliser consumption in Assam had increased. So, it may be concluded that impact of NFSM on food grains production was positive.

2.2 Trend in area, production and productivity of paddy and pulses

Plan wise trend in area, production and productivity of paddy are presented in Table 2.2 and are demonstrated in Fig.2.1, Fig. 2.2 and Fig.2.3 during the period of 1997-98 to 2011-12.

Average AGR of paddy area was 0.16 per cent during 9th plan period, -2.82 per cent in 10th plan period and 2.90 per cent in 11th plan period. It is seen that average AGR was increasing after launching of NFSM in 2007. Likewise, production of paddy was also increased during 11th plan period and average AGR stood at 10.37 per cent. In case of productivity, it showed an increasing trend. The average AGR of productivity during 9th plan period was 2.32 per cent followed by -2.45 per cent during 10th plan period and 7.10 per cent in 11th plan period. It is evident from the Table that NFSM has positive impact on food grains production.

Table 2.2

Trend in Area, Production and Yield of Paddy in Assam

Year	Area (lakh ha)	Production(Tonnes)	Productivity (Qtls/ha)
1997-98	25. 26	5412598	21. 43
1998-99	24. 54	5207731	21. 22
1999-00	26. 49	6177037	23. 32
2000-01	26. 46	6397509	24. 18
2001-02	25. 36	6166797	24. 32
9th Plan Avg. AGR	**0.16**	**2.63**	**2.32**
2002-03	25. 41	5980483	23. 54
2003-04	25. 30	6209494	24. 55
2004-05	23. 84	5553194	23. 30
2005-06	24. 20	5683901	23. 49
2006-07	21. 88	4674378	21. 36
10th Plan Avg. AGR	**-2.82**	**-5.03**	**-2.45**
2007-08	23. 24	5314418	22. 87
2008-09	24. 84	6518058	26. 24
2009-10	25. 30	7053478	27. 88
2010-11	25. 65	8052046	31. 39
2011-12	25. 18	7500757	29. 79
11th Plan Avg. AGR	**2.90**	**10.37**	**7.10**

Source: *Statistical Handbook of Assam (Relevant Years), Directorate of Economics and Statistics, Government of Assam*

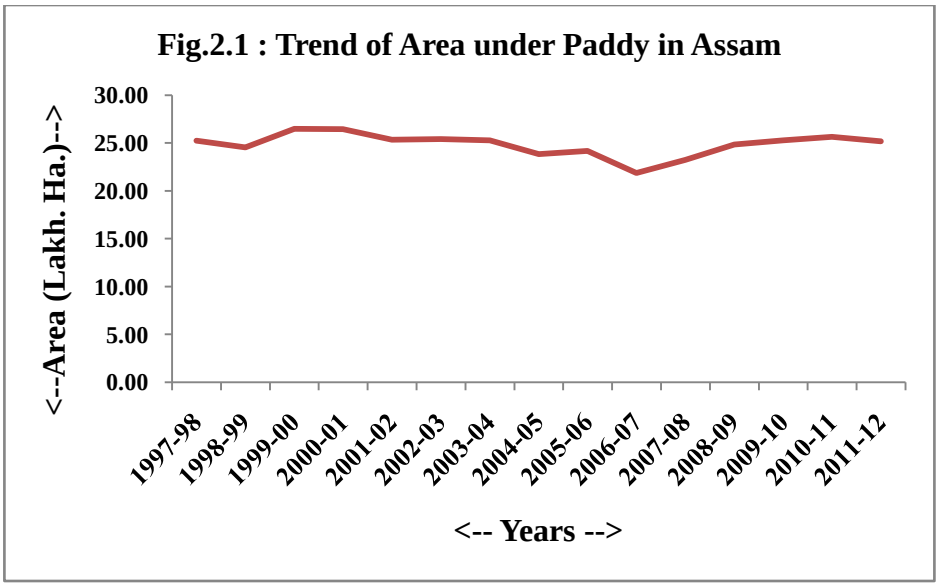


Fig.2.1 : Trend of Area under Paddy in Assam
<--Area (Lakh. Ha.)-->
30.00
25.00
20.00
15.00
10.00
5.00
0.00
1997-98
1998-99
1999-00
2000-01
2001-02
2002-03
2003-04
2004-05
2005-06
2006-07
2007-08
2008-09
2009-10
2010-11
2011-12
<-- Years -->

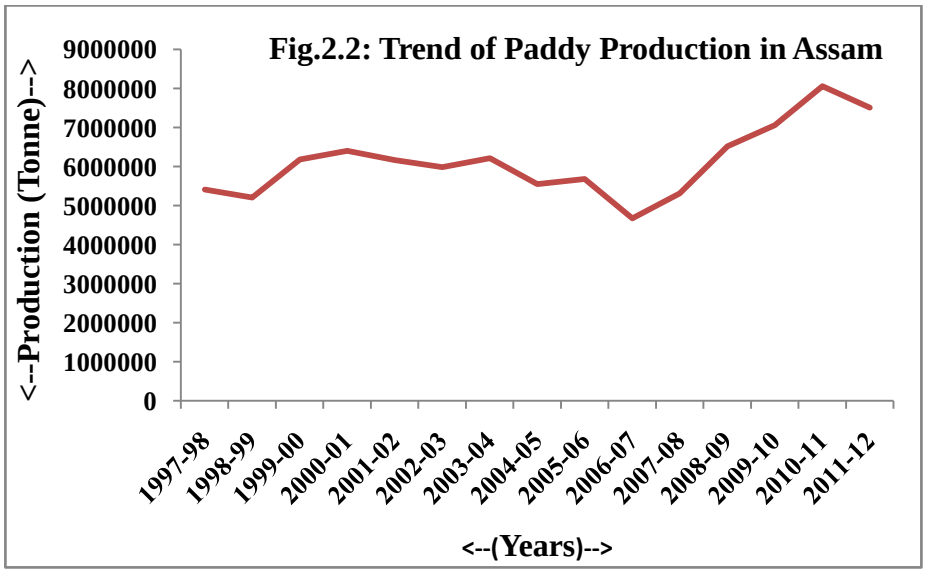


Fig.2.2: Trend of Paddy Production in Assam
<--Production (Tonne)-->
9000000
8000000
7000000
6000000
5000000
4000000
3000000
2000000
1000000
0
1997-98
1998-99
1999-00
2000-01
2001-02
2002-03
2003-04
2004-05
2005-06
2006-07
2007-08
2008-09
2009-10
2010-11
2011-12
<--(Years)-->

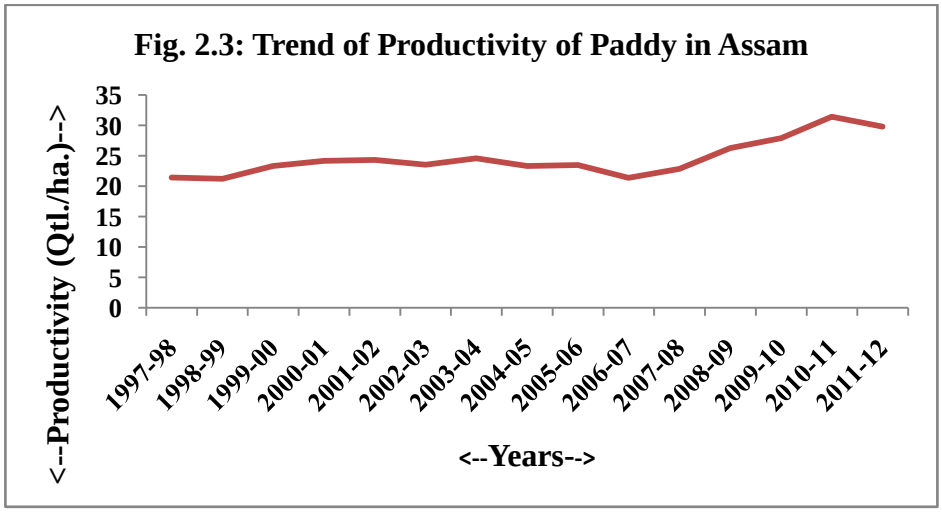


Fig. 2.3: Trend of Productivity of Paddy in Assam
<--Productivity (Qtl./ha.)-->
35
30
25
20
15
10
5
0
1997-98
1998-99
1999-00
2000-01
2001-02
2002-03
2003-04
2004-05
2005-06
2006-07
2007-08
2008-09
2009-10
2010-11
2011-12
<--Years-->

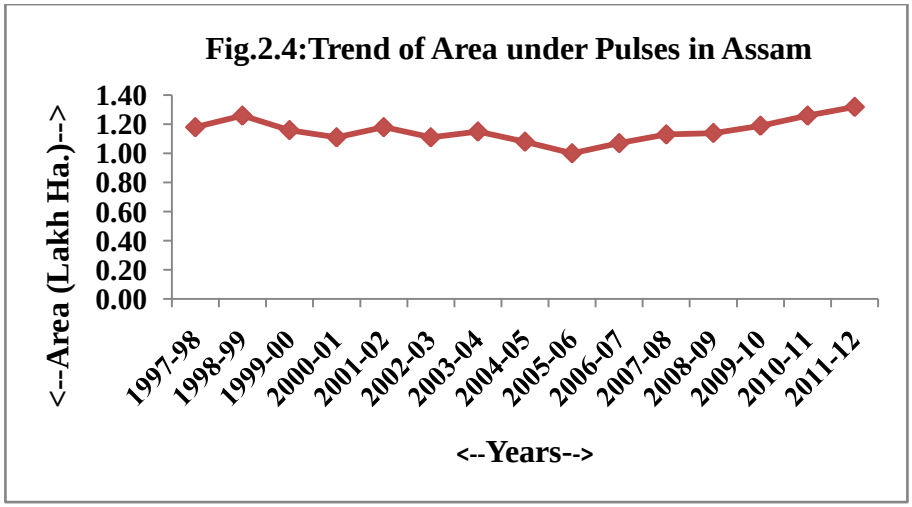
Table 2.3 shows trend in area, production and yield of pulses in Assam which is reflected in Fig. 2.4, Fig. 2.5 and Fig 2.6. There was no change of average AGR of area during 9th plan period. It was estimated at -1.77 per cent during 10th plan period and 4.30 per cent during 11th plan period. The average AGR of production during 9th plan period was 0.47 per cent, -2.05 per cent during 10th plan period and 4.30 per cent during 11th plan period. The productivity of pulses showed an increasing trend after launching the NFSM. The average

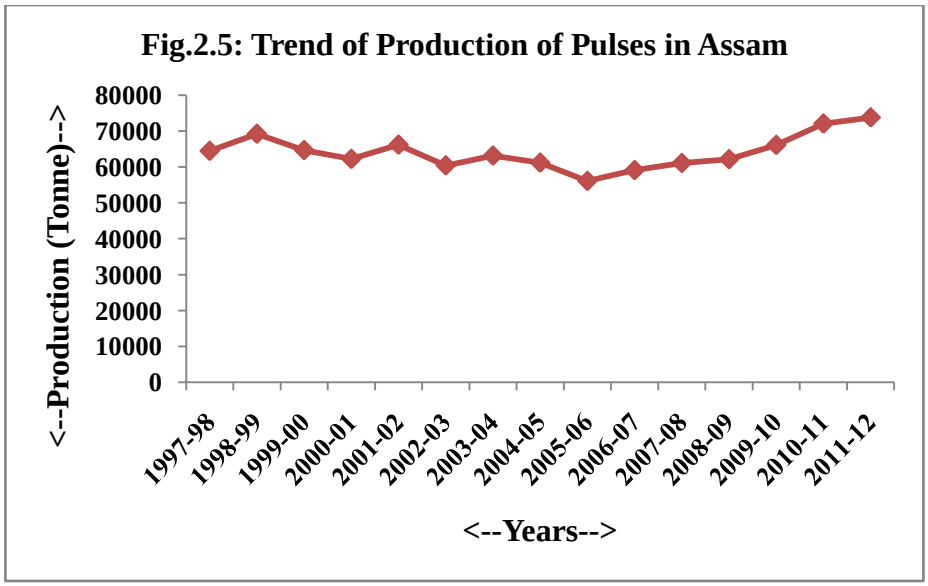
Table 2.3

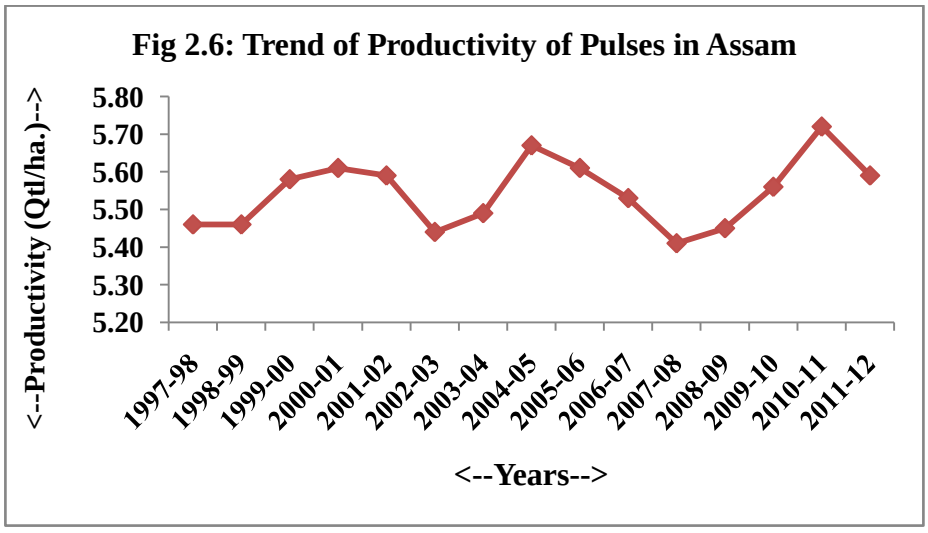
Trend in Area, Production and Yield of Pulses in Assam

Year	Area (lakh ha)	Production(Tonnes)	Productivity (Qtl/ha)
1997-98	1. 18	64464	5. 46
1998-99	1. 26	69222	5. 46
1999-00	1. 16	64688	5. 58
2000-01	1. 11	62240	5. 61
2001-02	1. 18	66188	5. 59
9th Plan Avg. AGR	**0.00**	**0.47**	**-0.43**
2002-03	1. 11	60440	5. 44
2003-04	1. 15	63160	5. 49
2004-05	1. 08	61200	5. 67
2005-06	1. 00	56122	5. 61
2006-07	1. 07	59122	5. 53
10th Plan Avg. AGR	**-1.77**	**-2.05**	**-0.19**
2007-08	1. 13	61098	5. 41
2008-09	1. 14	62154	5. 45
2009-10	1. 19	66118	5. 56
2010-11	1. 26	72058	5. 72
2011-12	1. 32	73772	5. 59
11th Plan Avg. AGR	**4.30**	**4.56**	**1.20**

Source: *Statistical Handbook of Assam (Relevant Years), Directorate of Economics and Statistics, Government of Assam*







AGR during 9th plan period was -0.43 per cent which was marginally declined to -0.19 per cent during 10th plan period and further increased to 1.20 per cent during 11th plan period. Thus the NFSM had positive impact on pulses production as well.

2. 3 Growth of paddy and pulse crops-impact of NFSM in Assam

Annual growth of paddy and pulses from 2007-08 to 2012-13 are presented in Table 2.4. It is also represented by Fig. 2.7 to Fig 2.12. It is seen from the Table that the AGR of NFSM paddy area was 7.40 per cent in 2007-08, after which it becomes lower and in 2011-12 and in 2012-13 AGR stood at -1.82 per cent and -9.32 per cent respectively. The AGR of

paddy production varied from 7.50 per cent (in 2012-13) to 20.92 per cent (in 2010-11). But in 2011-12, AGR was -8.11 per cent. In case of productivity of paddy, AGR varied from 6.51

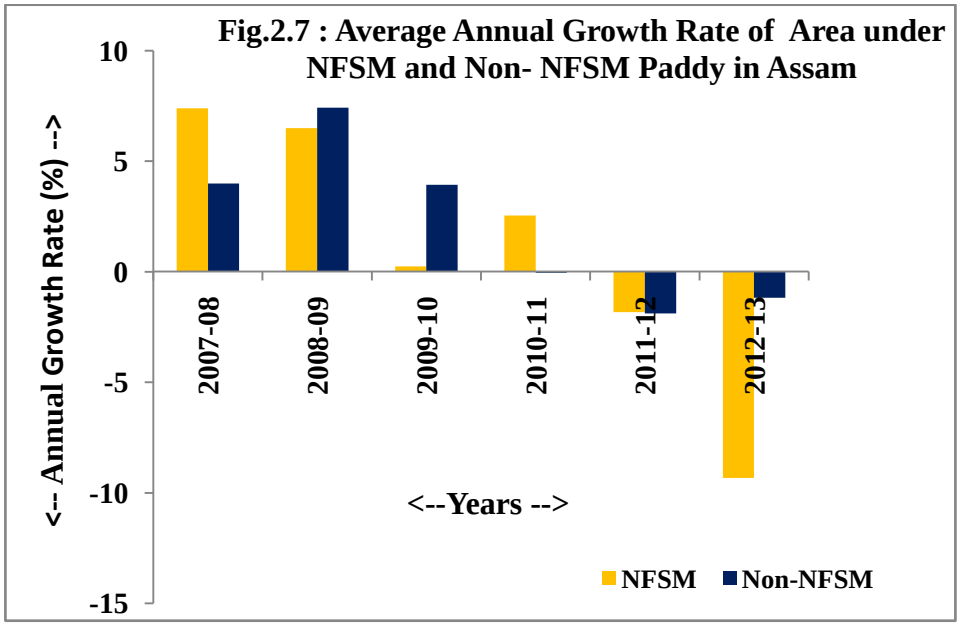
Table- 2.4

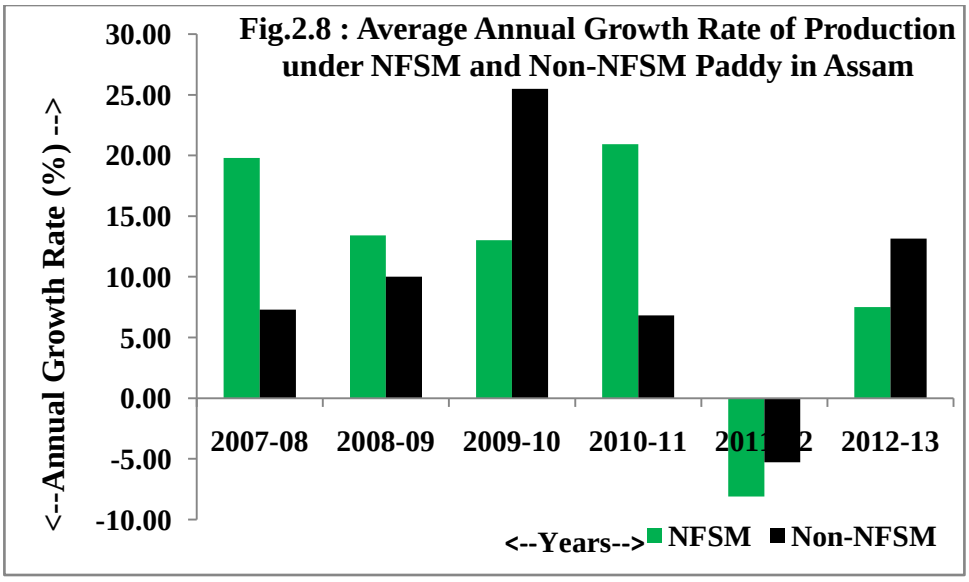
Average Annual Growth Rate of NFSM Paddy and Pulses in Assam

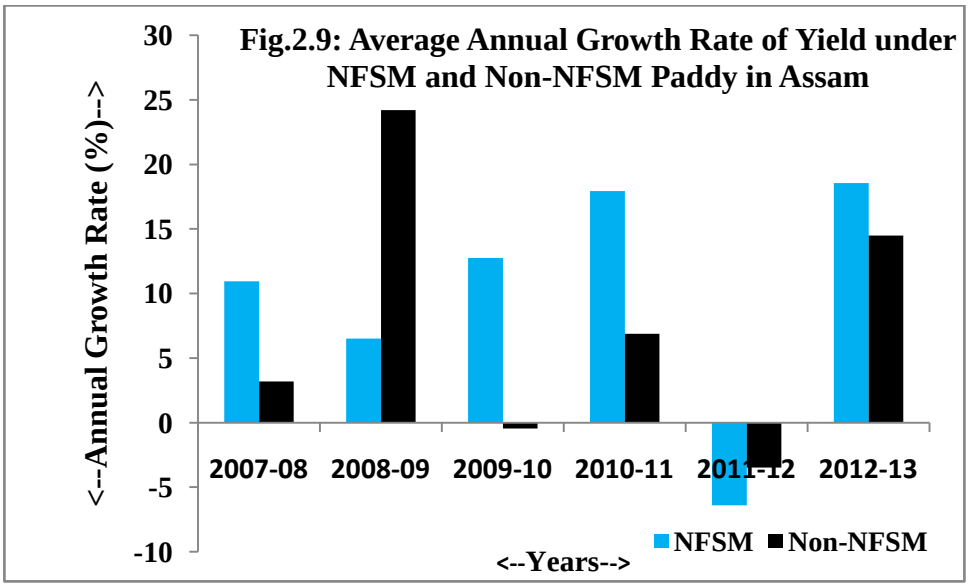
Years	NFSM (Paddy)			Non-NFSM (Paddy)			NFSM (Pulses)			Non-NFSM (Pulses)		
	A	P	Y	A	P	Y	A	P	Y	A	P	Y
2007-08	7. 40	19. 79	10. 93	3. 99	7. 31	3. 19						
2008-09	6. 49	13. 42	6. 51	7. 42	10. 01	24. 21						
2009-10	0. 25	13. 02	12. 74	3. 94	25. 48	-0. 47						
2010-11	2. 55	20. 92	17. 92	-0. 05	6. 82	6. 87	NA	NA	NA	NA	NA	NA
2011-12	-1. 82	-8. 11	-6. 41	-1. 88	-5. 29	-3. 47	12. 7	11. 78	-0. 88	-3. 56	-11. 73	-8. 58
2012-13	-9. 32	7. 5	18. 55	-1. 18	13. 15	14. 49	2. 87	8. 13	5. 17	13. 49	28. 01	12. 76

Source: *Statistical Handbook of Assam (Relevant Years), Directorate of Economics and Statistics, Government of Assam*

per cent (in 2008-09) to 17.92 per cent (in 2010-11) and in 2011-12 the AGR stood at -6.41 per cent. The AGR in Non-NFSM paddy area was 3.99 per cent in 2007-08, 7.42 per cent in 2008-09 and 3.94 in 2009-10. But from 2010-11 to 2012-13 the AGR was negative. The AGR in Non-NFSM paddy production was highest (25.48 per cent) in 2009-10and in 2011-12 the AGR of production was negative. The AGR in Productivity varied from 3.19 per cent to 24.21 per cent. In 2009-10 and 2011-12 productivity of paddy showed negative AGR.







The AGR of NFSM pulses area was 12.70 per cent in 2011-12 and 2.87 per cent in 2012-13. The AGR of production was higher (11.78 per cent) in 2011-12 and 8.13 per cent in 2012-13. In 2011-12, productivity showed a negative AGR (-0. 88 per cent) and it was 5.17 per cent in 2012-13. The AGR of Non-NFSM pulses showed negative AGR in area, production and productivity in 2011-12. The AGR of Non-NFSM pulses in respect of area, production and yield during 2012-13 were 13.49 per cent, 28.01 per cent and 12.76 per cent respectively.

It is seen that AGR of production and productivity in Non-NFSM paddy and pulses were in higher side. It may be due to the delay in input supply specially seed and

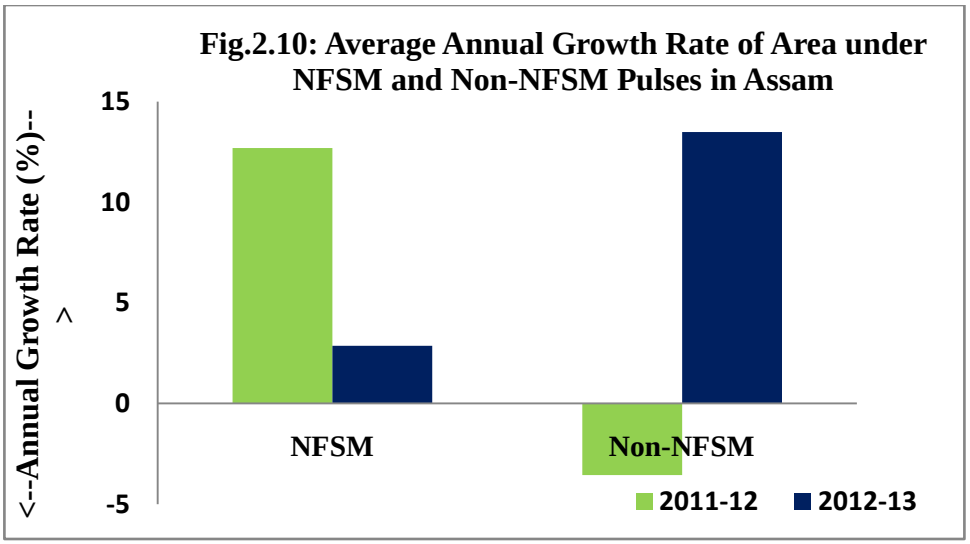


Fig.2.10: Average Annual Growth Rate of Area under NFSM and Non-NFSM Pulses in Assam
<--Annual Growth Rate (%)-->
15
10
5
0
-5
NFSM
Non-NFSM
2011-12
2012-13

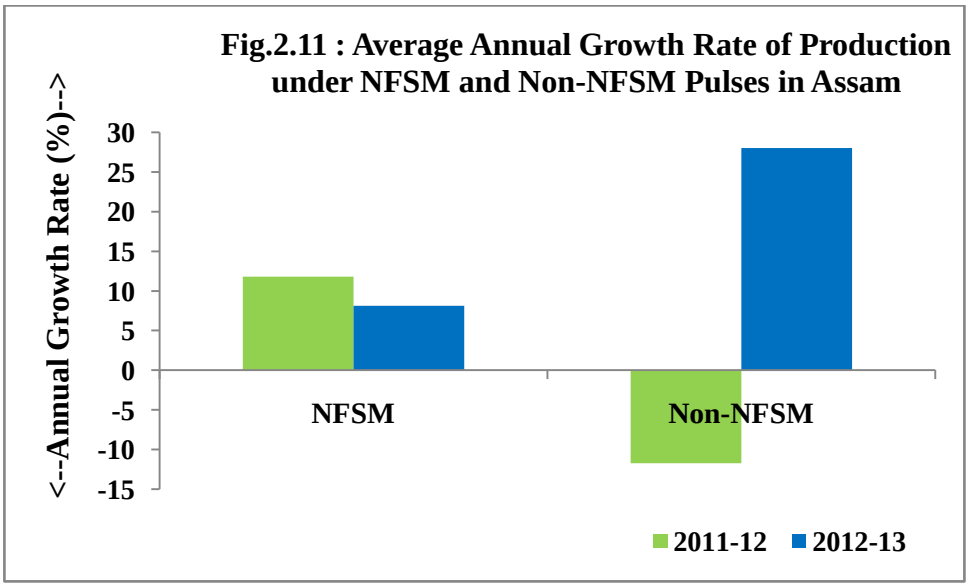


Fig.2.11 : Average Annual Growth Rate of Production under NFSM and Non-NFSM Pulses in Assam
<--Annual Growth Rate (%)-->
30
25
20
15
10
5
0
-5
-10
-15
NFSM
Non-NFSM
2011-12
2012-13

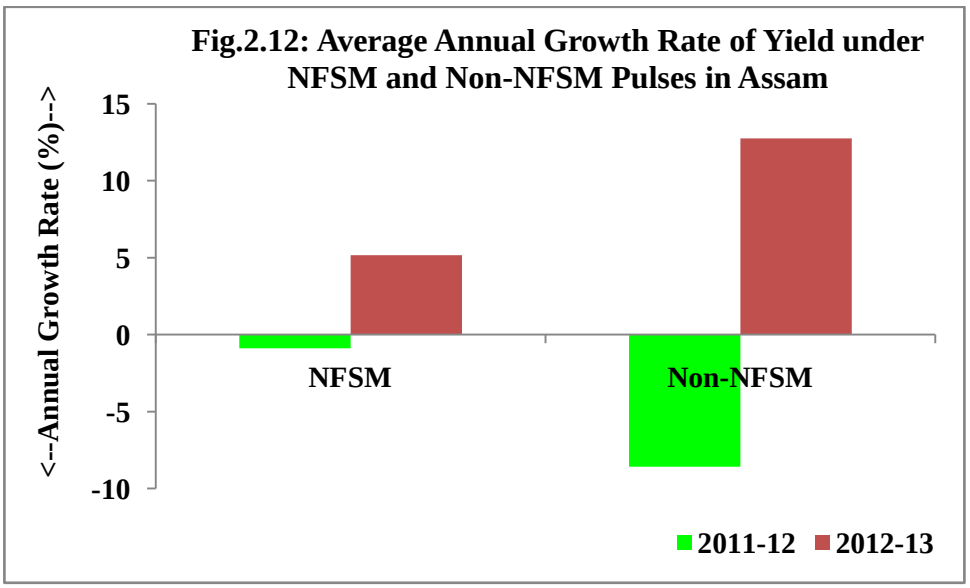


Fig.2.12: Average Annual Growth Rate of Yield under NFSM and Non-NFSM Pulses in Assam
<--Annual Growth Rate (%)-->
15
10
5
0
-5
-10
NFSM
Non-NFSM
2011-12
2012-13

other programmes being run in the Non-NFSM districts. Besides, a biotic factor cannot be denied also.

2. 4: District wise Growth of paddy and pulses crops and impact of NFSM Paddy

District wise average AGR in area, production and yield of paddy in NFSM and Non-NFSM districts in Assam are presented in Table-2.5. It is seen from the Table that during 9th five year plan AGR in area varied from 0. 23 per cent in Tinsukia district to 3.20 per cent in Darrang district. In Barpeta, Sonitpur and Nagaon district, AGR in area was negative. The AGR in production varied from 0. 83 per cent in Karbi- Anglong district to 12.58 per cent in Darrang district. In Sonitpur and Morigaon district, AGR in production was negative (-2.44 & -3.72 respectively). AGR in productivity varied from 0.08 per cent in Karbi-Anglong to 9.28 per cent in Darrang district. In Sonitpur, Morigaon and Lakhimpur district, AGR in productivity was negative (-1.27, -4.11 & -2.08 per cent respectively). During 9th plan period total AGR in area, production and productivity in NFSM districts were 0.36 per cent, 2.75 per cent and 2.16 per cent respectively and in Non-NFSM districts total AGR in area, production and productivity were -0.21 per cent, 2.58 per cent, and 5.24 per cent respectively. It is seen that AGR in productivity was higher in Non- NFSM districts. During 10th plan period total average AGR in area, production and productivity stood at -5.43 per cent, -7.29 per cent and -2.01 per cent, respectively in NFSM districts. In Non-NFSM districts, total average AGR in area, production and productivity stood at 1.62 per cent, -2.05 per cent and -3.81 per cent respectively. During 11th plan period total average AGR in area, production and productivity stood at 3.09 per cent, 11.81 per cent and 8.34 per cent respectively in NFSM districts. In Non-NFSM districts, the total average AGR in area, production and productivity stood at 2.69 per cent, 2.69 per cent and 6.06 per cent, respectively.

Pulses

District wise average AGR in area, production and yield of pulses in NFSM and Non-NFSM districts in Assam are presented in Table-2.6. It is seen from the table that during 9th five year plan, AGR in area varied from 0. 36 per cent in Dhubri district to 20.70 per cent in Jorhat district. In Nagaon district AGR in area was negative. The AGR in production varied from 0. 98 per cent in Nagaon district to 19.39 per cent in Jorhat district. The AGR in

Table 2.5
Average AGR in Area, Production and Yield of Paddy in NFSM and Non-NFSM districts in Assam

(in Per cent)

AGR of Paddy									
Districts	9th FYP			10 th FYP			11th FYP		
	NFSM Districts								
	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield
Goalpara	1.20	4.82	3.71	-0.17	-2.86	-2.83	1.18	10.26	8.17
Kokrajhar	0.87	1.35	0.41	2.20	3.88	1.66	1.45	10.75	9.12
Bongaigaon	1.11	6.20	5.08	-8.16	-10.76	-2.82	-0.46	10.98	11.69
Nalbari	1.59	3.93	2.19	-10.41	-8.16	2.97	-0.70	6.69	7.55
Barpeta	-2.08	6.51	7.92	-7.87	-7.41	0.73	9.26	24.65	13.47
Darrang	3.20	12.58	9.28	-11.12	-22.72	1.02	9.97	23.59	12.21
Sonitpur	-1.65	-2.44	-1.27	-1.57	-1.76	-1.89	7.37	23.03	13.24
Nagaon	-0.59	4.22	4.77	-5.59	-7.49	-1.95	2.50	4.21	2.02
Morigaon	0.22	-3.72	-4.11	-4.86	-9.44	-3.77	6.27	17.56	11.65
Lakhimpur	2.70	1.29	-2.08	0.48	-5.38	-5.84	4.13	33.99	27.18
Dhemaji	2.50	6.16	2.20	1.64	1.11	-0.54	0.03	3.64	3.54
Tinsukia	0.23	6.62	6.43	-1.28	-6.14	-4.69	2.51	10.21	7.93
K. Anglong	0.65	0.83	0.08	-0.01	0.52	0.67	-0.65	1.05	1.45
Sub Total	0.36	2.75	2.16	-5.43	-7.29	-2.01	3.09	11.81	8.34
Non NFSM Districts									
Cachar	-0.11	3.57	3.73	0.05	-3.40	-4.31	0.81	17.35	13.67
Hailakandi	2.49	5.84	3.31	-2.11	-2.06	0.07	3.35	6.72	3.20
Karimganj	-1.85	3.17	5.41	0.49	-1.50	-2.01	-0.17	10.32	10.67
Dhubri	-0.01	12.37	11.55	-7.27	-4.83	2.62	0.76	6.92	6.23
Kamrup	-0.11	3.76	3.75	-11.58	-11.08	0.28	6.77	13.92	5.89
Jorhat	1.29	2.62	1.60	-4.07	-9.99	-7.23	4.33	15.61	10.26
Golaghat	1.12	-0.68	-1.75	-5.09	-8.32	-4.06	12.19	19.79	6.41
Sivasagar	-0.72	3.75	4.53	-0.48	-5.32	-4.94	-0.03	11.17	9.99
Dibrugarh	-0.62	-2.44	-2.01	-3.46	-3.16	0.30	1.96	2.74	-0.18
N.C. Hills	0.76	-0.20	-0.93	0.21	-3.34	-4.24	2.00	18.65	16.19
Baksa*	-	-	-	-1.00	-1.36	-3.45	1.43	10.25	8.24
Chiraag*	-	-	-	3.88	5.76	-3.65	-0.38	1.34	1.51
Kamrup(M)*	-	-	-	4.30	1.73	-0.63	5.07	12.52	7.16
Udalguri*	-	-	-	0.47	-5.42	-4.21	4.24	18.25	14.03
Sub total	-0.21	2.58	5.24	1.62	-2.05	-3.81	2.69	2.69	6.06

Note :* To the 9th Plan period, districts were not formed

Table 2.6

Average AGR in Area, Production and Yield of Pulses in NFSM and Non-NFSM districts in Assam

(in Per cent)

Districts	9th FYP			10 th FYP			11th FYP		
	NFSM Districts								
	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield
Kokrajhar	4.57	6.98	2.27	13.61	12.12	-0.07	1.18	1.70	0.27
Bongaigaon	2.03	3.68	2.03	-0.15	1.57	0.57	-1.13	0.11	1.39
Barpeta	1.17	9.60	0.61	-3.35	-1.71	1.40	6.73	9.77	2.46
Sonitpur	6.61	5.17	-1.51	2.45	6.08	2.11	-0.32	0.20	1.13
Nagaon	-0.34	0.98	1.61	-2.64	-0.49	1.06	-1.96	-3.76	-0.65
Dhubri	0.36	2.84	2.53	-7.91	-8.80	-0.71	10.22	12.24	2.35
Kamrup	1.37	2.79	0.92	-13.41	-14.65	-1.28	5.96	6.63	-2.62
Jorhat	20.70	19.39	-1.95	-5.63	2.34	9.12	21.32	12.82	-6.48
*Baksa				0.52	0.26	-0.25	3.80	3.27	-1.11
*Udalguri				-1.38	-0.29	1.80	2.86	1.21	-1.03
Sub Total	4.56	6.43	-0.81	-1.84	-0.36	1.37	4.87	4.42	0.43
Non NFSM Districts									
Goalpara	-0.31	-2.19	-0.32	-0.06	-0.90	-0.93	7.00	10.72	3.65
Nalbari	2.27	1.82	-0.52	-12.49	-11.50	1.18	-2.32	-5.40	-3.31
Darrang	0.00	0.36	-0.39	-22.69	-24.40	-3.25	18.62	22.83	2.83
Morigaon	-17.44	-19.15	-1.74	8.43	10.01	0.62	7.98	4.65	-1.22
Lakhimpur	2.33	4.23	1.85	6.54	5.61	0.55	9.53	11.61	1.61
Dhemaji	-11.02	-11.52	-0.69	4.69	7.24	2.65	18.02	23.92	4.45
Tinsukia	-1.98	-0.57	0.96	-0.01	3.69	0.05	21.20	25.14	5.60
K. Anglong	3.64	4.07	0.69	-0.96	-0.82	0.14	8.36	10.24	1.16
Cachar	45.39	37.57	-2.07	18.90	20.33	1.08	-5.55	-4.83	0.72
Hailakandi	-0.38	0.07	0.04	27.86	24.87	0.28	17.35	12.58	-4.28
Karimganj	-10.23	-4.94	5.01	42.13	50.83	11.85	5.05	-9.12	-11.60
Golaghat	-5.46	-5.88	0.03	1.14	-5.38	-1.91	0.05	2.10	1.94
Sivasagar	10.68	6.58	-2.01	-10.93	-10.05	1.00	1.36	5.20	3.25
Dibrugarh	-0.60	-4.15	-3.47	-24.36	-21.01	0.55	13.48	17.72	1.90
N.C. Hills	3.01	-2.84	-0.34	13.00	12.51	-0.92	27.60	28.04	0.42
*Chirang	-	-	-	2.79	-4.09	1.14	-1.33	-1.85	-0.40
*Kamrup(M)	-	-	-	42.03	-45.42	1.09	-2.48	-1.96	-1.79
Sub Total	1.33	0.23	**-0.19**	5.65	0.68	0.89	8.45	8.91	0.29

Note :1.* To the 9th Plan period, districts were not formed

2.Although NFSM Pulses programme was introduced during 2010-11, Table is prepared according to the Tabular model send by the co-ordinating Centre

productivity varied from 0. 61 per cent in Barpeta district to 2.53 per cent in Dhubri district. In Sonitpur and Jorhat district, AGR in productivity was negative (-1.51 and -1.95 per cent, respectively). During 9th plan period, the total AGR in area, production and productivity of pulses in NFSM districts were 4. 56 per cent, 6.43 per cent and -0.81 per cent respectively and in Non-NFSM districts, the total AGR in area, production and productivity were 1.33 per cent, 0.23 per cent, and -0.19 per cent, respectively. During 10th plan period, the total average AGR in area, production and productivity of pulses stood at -1.84 per cent, -0.36 per cent and 1.37 per cent respectively in NFSM districts. In Non-NFSM districts the total average AGR in area, production and productivity stood at 5.65 per cent, 0.68 per cent and 0.89 per cent respectively. During 11th plan period the total average AGR in area, production and productivity was recorded at 4.87 per cent, 4.42 per cent and 0.43 per cent, respectively in NFSM districts. In Non-NFSM districts the total average AGR in area, production and productivity stood at 8.45 per cent, 8.91 per cent and 0.29 per cent, respectively. During 10th and 11th plan period, the total average AGR was higher in Non-NFSM districts than that of NFSM districts.

2.5 Financial progress under NFSM in the 11th & 12th FYP, classification of outlay and expenditure by districts and nature of interventions:

Table- 2.7 shows the financial progress under NFSM –Rice and NFSM-Pulses in the state. The targeted amount under NFSM-Rice was Rs.5914.84 lakh in 2010-11 which was the highest amount targeted during 11th plan period and achievement percentage was 99.61. The average AGR on amount targeted was Rs.3414.28 lakh during the 11th plan period and achievement was Rs. 3175.40 lakh and the achievement percentage stood at 93.00. In 2012-13 the targeted amount was Rs.8373.73 lakh and achievement was Rs. 2666.33 lakh and the percentage of achievement was 31.84. In 2013-14, amount released, amount targeted and achievement were Rs.5449.55 lakh, Rs.17517.03 lakh and Rs. 5314.55 lakh respectively and the percentage of achievement was 30.34. During 11th plan period, the average AGR on amount released amount targeted and achievement were Rs. 950.23 lakh, Rs. 889.46 lakh and Rs. 950.23 lakh respectively and the percentage of achievement stood at 106.83 . In 2012-13, the amount released, amount targeted and achievement were Rs.420.53 lakh, Rs.1385.20 lakh and Rs. 420.53 lakh respectively and the percentage of achievement stood at 30.36. In 2013-

14, the amount released, amount targeted and achievement were Rs.4061.04 lakh, Rs.7226.808 lakh and Rs. 3942.76 lakh respectively and the percentage of achievement stood at 54.56.

The average AGR of amount released, amount targeted and achievement for total NFSM (Rice & Pulses) were Rs. 4125.63 lakh, Rs.4303.74 lakh and Rs. 3555.49 lakh respectively and the percentage of achievement stood at 82.61.

Table-2.8 represents the district wise outlay and expenditure on NFSM-rice during 11th five year plan period in the state. Out of 13 NFSM-rice districts, allocation was highest (128.49 lakh) in Nagaon district and lowest (12. 90 lakh) in Tinsukia district. The total outlay and expenditure was 909.95 lakh in 2007-08. In 2008-09, also the outlay was highest (131.65 lakh) in Nagaon district and lowest (69.035 lakh) in Tinsukia district. Total outlay and expenditure was 1223.09 lakh in 2008-09. In 2009-10, outlay was highest (78.38 lakh) in Darrang district and lowest (35.64 lakh) in Tinsukia district and the total outlay and expenditure was 773.12 lakh. Again in 2010-11 and 2011-12, the district of Nagaon recorded the highest outlay (105.585 lakh and 50.29 lakh respectively.) Expenditure was also 100 per cent in respective years. As a whole during 11th plan period outlay and expenditure was 100 per cent

Table-2.9 shows the district wise outlay and expenditure on NFSM-Pulses during 11th five year plan period in the state. Out of 10 NFSM-Pulses districts, allocation was highest

Table – 2.7

Financial Progress Report under NFSM in Assam

year	NFSM-Rice				NFSM - Pulses				NFSM Total			
	Amount released (Rs in lakh)	Target (Rs in lakh)	Ach (Rs in lakh)	Percentage of Achiv.	Amount released (Rs in lakh)	Target (Rs in lakh)	Ach (Rs in lakh)	Percentage of Achiv.	Amount released (Rs in lakh)	Target (Rs in lakh)	Ach (Rs in lakh)	Percentage of Achievement
2007-08	1139.42	1167.06	1139.42	97.63	0		0	0	1139.42	1167.06	1139.42	97.63
2008-09	2705.65	3262.65	2705.65	82.93	0		0	0	2705.65	3262.65	2705.65	82.93
2009-10	3616.23	4235.82	3616.23	85.37	0		0	0	3616.23	4235.82	3616.23	85.37
2010-11	5891.99	5914.84	5891.99	99.61	766.75	914.215	766.75	83.87	6658.74	6829.055	6658.74	97.51
2011-12	2523.72	2491.03	2523.72	101.31	1133.71	864.707	1133.71	131.11	3657.43	3355.737	3657.43	108.99
11th plan Avg AGR	3175.4	3414.28	3175.4	93.00	950.23	889.46	950.23	106.83	4125.63	4303.74	3555.49	82.61
2012-13	2666.33	8373.73	2666.33	31.84	420.53	1385.2	420.53	30.36	3086.86	9758.93	3086.86	31.63
2013-14	5449.55	17517.03	5314.55	30.34	4061.04	7226.808	3942.76	54.56	9510.59	24743.838	9257.31	37.41

Source: Joint Director of Agriculture, State Nodel Office, NFSM, Assam Achiv.----- Achievement

Table - 2.8
District wise Outlay and Expenditure of NFSM (Rice) for the 11th Five Year Plan, Assam

(Rs. In Lakh)

Sl.No.	Districts	2007-08			2008-09			2009-10			2010-11			2011-12		
		Outlay	Exp	P.C Exp. to Outlay	Outlay	Exp	P.C Exp. to Outlay	Outlay	Exp	P.C Exp. to Outlay	Outlay	Exp	P.C Exp. to Outlay	Outlay	Exp	P.C Exp. to Outlay
1	Barpeta	117.935 (12.96)	117.935 (12.96)	100.00	123.97 (10.14)	123.97 (10.14)	100.00	66.19 (8.56)	66.19 (8.56)	100.00	83.705 (7.54)	83.705 (7.54)	100.00	38.86 (7.28)	38.86 (7.28)	100.00
2	Bongaigaon	69.524 (7.64)	69.524 (7.64)	100.00	96.285 (7.87)	96.285 (7.87)	100.00	59.62 (7.71)	59.62 (7.71)	100.00	77.39 (6.97)	77.39 (6.97)	100.00	39.36 (7.38)	39.36 (7.38)	100.00
3	Darrang	95.562 (10.50)	95.562 (10.50)	100.00	101.515 (8.30)	101.515 (8.30)	100.00	78.38 (10.14)	78.38 (10.14)	100.00	94.4 (8.50)	94.4 (8.50)	100.00	49.47 (9.27)	49.47 (9.27)	100.00
4	Dhemaji	29.526 (3.24)	29.526 (3.24)	100.00	73.61 (6.02)	73.61 (6.02)	100.00	48.38 (6.26)	48.38 (6.26)	100.00	73.315 (6.60)	73.315 (6.60)	100.00	36.86 (6.91)	36.86 (6.91)	100.00
5	Goalpara	62.597 (6.88)	62.597 (6.88)	100.00	92.41 (7.56)	92.41 (7.56)	100.00	73.25 (9.47)	73.25 (9.47)	100.00	102 (9.19)	102 (9.19)	100.00	41.725 (7.82)	41.725 (7.82)	100.00
6	Karbi-Anglong	25.934 (2.85)	25.934 (2.85)	100.00	82.77 (6.77)	82.77 (6.77)	100.00	44.5 (5.76)	44.5 (5.76)	100.00	83.275 (7.50)	83.275 (7.50)	100.00	39.28 (7.36)	39.28 (7.36)	100.00
7	Kokrajhar	95.856 (10.53)	95.856 (10.53)	100.00	117.035 (9.57)	117.035 (9.57)	100.00	57.12 (7.39)	57.12 (7.39)	100.00	92.465 (8.33)	92.465 (8.33)	100.00	38.86 (7.28)	38.86 (7.28)	100.00
8	Lakhimpur	71.206 (7.83)	71.206 (7.83)	100.00	91.63 (7.49)	91.63 (7.49)	100.00	52.02 (6.73)	52.02 (6.73)	100.00	85.925 (7.74)	85.925 (7.74)	100.00	43.055 (8.07)	43.055 (8.07)	100.00
9	Morigaon	76.598 (8.42)	76.598 (8.42)	100.00	83.65 (6.84)	83.65 (6.84)	100.00	78.25 (10.12)	78.25 (10.12)	100.00	104.41 (9.40)	104.405 (9.40)	100.00	39.815 (7.46)	39.815 (7.46)	100.00
10	Nagaon	128.488 (14.12)	128.488 (14.12)	100.00	131.65 (10.76)	131.65 (10.76)	100.00	77.36 (10.01)	77.36 (10.01)	100.00	105.59 (9.51)	105.585 (9.51)	100.00	50.29 (9.43)	50.29 (9.43)	100.00
11	Nalbari	46.785 (5.14)	46.785 (5.14)	100.00	83.16 (6.80)	83.16 (6.80)	100.00	48.76 (6.31)	48.76 (6.31)	100.00	57.72 (5.20)	57.72 (5.20)	100.00	42.6 (7.99)	42.6 (7.99)	100.00
12	Sonitpur	77.035 (8.47)	77.035 (8.47)	100.00	76.37 (6.24)	76.37 (6.24)	100.00	53.65 (6.94)	53.65 (6.94)	100.00	83.645 (7.53)	83.645 (7.53)	100.00	38.55 (7.23)	38.55 (7.23)	100.00
13	Tinsukia	12.904 (1.42)	12.904 (1.42)	100.00	69.035 (5.64)	69.035 (5.64)	100.00	35.64 (4.61)	35.64 (4.61)	100.00	66.46 (5.99)	66.46 (5.99)	100.00	34.71 (6.51)	34.71 (6.51)	100.00
Total		909.95 (100.00)	909.95 (100.00)	100.00	1223.09 (100.00)	1223.09 (100.00)	100.00	773.12 (100.00)	773.12 (100.00)	100.00	1110.3 (100.00)	1110.29 (100.00)	100.00	533.44 (100.00)	533.44 (100.00)	100.00

Note: Figures in parentheses indicate percentage to total

Source: Joint Director of Agriculture, State Nodel Office, NFSM, Assam Exp.-→ Expenditure

Table -2.9
District wise Outlay and Expenditure of NFSM (Pulses) for the 11th Five Year Plan, Assam

(Rs. In Lakh)

Sl.No.	Districts	2007--08		2008-09		2009-10		2010-11			2011-12		
		Outlay	Exp	Outlay	Exp	Outlay	Exp	Outlay	Exp	P.C Epe. to Outlay	Outlay	Exp	P.C Epe. to Outlay
1	Baksa	0	0	0	0	0	0	16.174 (11.42)	16.174 (11.42)	100.00	13.588 (9.04)	13.588 (9.04)	100.00
2	Barpeta	0	0	0	0	0	0	13.572 (9.59)	13.572 (9.59)	100.00	21.374 (14.23)	21.374 (14.23)	100.00
3	Bongaigaon	0	0	0	0	0	0	9.764 (6.90)	9.764 (6.90)	100.00	11.98 (7.97)	11.98 (7.97)	100.00
4	Dhubri	0	0	0	0	0	0	17.166 (12.12)	17.166 (12.12)	100.00	15.452 (10.28)	15.452 (10.28)	100.00
5	Jorhat	0	0	0	0		0	11.97 -8.45	11.97 -8.45	100.00	13.758 (9.16)	13.758 (9.16)	100.00
6	Kamrup	0	0	0	0	0	0	14.146 (9.99)	14.146 (9.99)	100.00	15.44 (10.28)	15.44 (10.28)	100.00
7	Kokrajhar	0	0	0	0	0	0	14.816 (10.46)	14.816 (10.46)	100.00	13.228 (8.80)	13.228 (8.80)	100.00
8	Nagaon	0	0	0	0	0	0	14.604 (10.32)	14.604 (10.32)	100.00	16.696 (11.11)	16.696 (11.11)	100.00
9	Sonitpur	0	0	0	0	0	0	13.324 (9.41)	13.324 (9.41)	100.00	16.134 (10.74)	16.134 (10.74)	100.00
10	Udalguri	0	0	0	0	0	0	16.042 (11.33)	16.042 (11.33)	100.00	12.59 (8.38)	12.59 (8.38)	100.00
Total		0	0	0	0	0	0	141.578 (100.00)	141.578 (100.00)	100.00	150.24 (100.00)	150.24 (100.00)	100.00

Note: Figures in parentheses indicate percentage to total

Source: Joint Director of Agriculture, State Nodel Office, NFSM, Assam Exp.-→ Expenditure

(17.166 lakh) in Dhubri district and lowest (9.764 lakh) in Bongaigaon district in the year of launching. The total outlay and expenditure was 141.578 lakh in the year. In 2011-12, Outlay was highest (21.374 lakh) in Barpeta district and lowest (11.98 lakh) in Bongaigaon district. Total outlay and expenditure was recorded at150.24 lakh in 2011-12.

Category-wise interventions outlay and expenditure of NFSM-rice in Assam are presented in Table-2.8(a). Interventions on NFSM-rice in Assam were as follows-

1. Demonstration for improved technology-

a) Demonstration on IPP b) Demonstration on SRI and c) Demonstration on HRT

2. Seed Distribution –

a) Assistance for production of hybrid rice seeds b) Assistance for distribution of HYV seeds c) Assistance for distribution of hybrid rice seeds

3. Plant and soil protection management –

a) Incentive for micro-nutrient, b) Incentive for liming materials c) Assistance for PP Chemical & bio-agents

4. Resource conservation technology/tools-

a) Conoweeder, b) Manual sprayer, c) Rotavator

5. Efficient water application tools –

a) Pump set

6. Cropping system based trainings -

a) Farmers field school. b) Publicity c) Misc. expenditure and d) PMT & Misc. expenditure at HQ & District

7. Local initiative – a) STW, b) Soil health map, c) Pump set, d) Vermi-compost, e) Foundation seed production, f) Seed bin, g) Distribution of containers for seed treatment, h) Seed treating chemical, i) Marker and j) Paddy weeder

It is observed from Table-2.11 that in 2007-08, outlay in intervention (incentive for liming materials) was highest (500 lakh) and lowest (2.67 lakh) in intervention (Assistance for production of hybrid rice seeds). With regard to intervention in PMT and misc. expenditure at HQ and district, achievement percentage was 79. 29 per cent and in other intervention achievement were 100 per cent. In 2008-09, outlay in intervention (Assistance for distribution of HYV seeds) was highest (791.35lakh) and lowest (0.60 lakh) in intervention (Seed treating chemical)l. Achievement percentage in intervention (incentive

Table – 2.10

Category-wise Interventions outlay & Expenditure of NFSM-Rice For 11th FYP in Assam (2007-08 to 2011-12)

(Rs.in Lakh)

Sl No	Category-wise intervention	2007-08			2008-09			2009-10			2010-11			2011-12		
		Outlay	Exp.	Ach (%)	Outlay	Exp.	Ach. (%)	Outlay	Exp.	Ach (%)	Outlay	Exp.	Ach(%)	Outlay	Exp.	Ach (%)
1	**Demonstration for improved technology**															
a)	Demonstration on IPP	25.00 (2.09)	25.00 2.23)	100.00 (101.79)	46.55 (46.55)	46.55 (1.78)	100.00 (111.72)	82.15 (2.13)	82.15 (2.35)	100.00 (110.56)	82.15 (2.86)	82.15 (2.86)	100.00 (100.00)	100.00 (4.08)	100.00 (4.08)	100.00 (100.00)
b)	Demonstration on SRI	6.00 (0.53)	6.00 (0.54)	100.00 (101.79)	6.99 (0.24)	6.99 (0.27)	100.00 (111.72)	65.70 (1.70)	65.70 (1.88)	100.00 (110.56)	32.85 (1.14)	32.85 (1.14)	100.00 (100.00)	30.00 (1.22)	30.00 (1.22)	100.00 (100.00)
c)	Demonstration on HRT	0 0.00	0 0.00	0 0.00	6.99 (0.24)	6.99 (0.27)	100.00 (111.72)	16.44 (0.43)	16.44 (0.47)	100.00 (110.56)	30.00 (1.04)	30.00 (1.04)	100.00 (100.00)	45.00 (1.83)	45.00 (1.83)	100.00 (100.00)
2	**Seed Distribution**															
a)	Assistance for production of Hybrid Rice seeds	2.67 (0.23)	2.67 (0.24)	100.00 (101.79)	79.30 (2.72)	79.30 (3.04)	100.00 (111.72)	80.00 (2.07)	80.00 (2.29)	100.00 (110.56)	10.00 (0.35)	10.00 (0.35)	100.00 (100.00)	20.00 (0.82)	20.00 (0.82)	100.00 (100.00)
b)	Assistance for distribution of HYV seeds	125.00 (10.97)	125.00 (11.17)	0	791.35 (27.15)	791.35 (30.33)	100.00 (111.72)	320.00 (8.29)	320.00 (9.17)	100.00 (110.56)	500.00 (17.38)	500.00 (17.38)	100.00 (100.00)	200.00 (8.15)	200.00 (8.15)	100.00 (100.00)
c)	Assistance for distribution of Hybrid Rice seeds	0	0	0	0	0	0	0	0	0	40.00 (1.39)	40.00 (1.39)	100.00 (100.00)	0	0	0
3	**Plant and soil protection management**															
a)	Incentive for Micro-nutrient	5.00 (0.44)	5.00 (0.45)	100.00 (101.79)	279.30 (9.58)	279.30 (10.71)	100.00 (111.72)	335.00 (8.68)	267.01 (7.65)	79.70 (88.11)	278.00 (9.66)	278.00 (9.66)	100.00 (100.00)	250.00 (10.19)	250.00 (10.19)	100.00 (100.00)
b)	Incentive for Liming materials	500.00 43.88	500.00 44.67	100.00 (101.79)	558.60 (19.17)	475.00 (18.21)	85.03 (95.00)	200.00 (5.18)	69.51 (1.99)	34.76 (38.43)	250.00 (8.69)	250.00 (8.69)	100.00 (100.00)	250.00 (10.19)	250.00 (10.19)	100.00 (100.00)
c)	Assistance for Pp chemicals& Bio-agents	0	0	0	232.75 (7.99)	99.08 (3.80)	42.57 (47.56)	150.00 (3.89)	70.04 (2.01)	46.69 (51.62)	150.00 (5.21)	150.00 (5.21)	100.00 (100.00)	100.00 (4.08)	100.00 (4.08)	100.00 (100.00)
4	**Resource conservation Techniques/tools**															
a)	Conoweeder	150.00 (13.16)	150.00 (13.40)	100.00 (101.79)	465.03 (15.95)	346.50 (13.28)	74.51 (83.25)	150.00 (3.89)	150.00 (4.30)	100.00 (110.56)	189.00 (6.57)	189.00 (6.57)	100.00 (100.00)	246.72 (10.06)	246.72 (10.06)	100.00 (100.00)
b)	Manual Sprayer	0	0	0	0	0	0	300.00 (7.77)	294.96 (8.45)	98.32 (108.70)	67.79 (2.36)	67.79 (2.36)	100.00 (100.00)	42.00 (1.71)	42.00 (1.71)	100.00 (100.00)
c)	Rotavator	0	0	0	0	0	0	30.00 (0.78)	7.80 (0.22)	26.00 (28.75)	15.00 (0.52)	15.00 (0.52)	100.00 (100.00)	90.00 (3.67)	90.00 (3.67)	100.00 (100.00)
5	**Efficient water application tools**															
a)	Pump set	0	0	0	0	0	0	1462.00 (37.88)	1462.00 (41.88)	100.00 (110.56)	1000.00 (34.76)	1000.00 (34.76)	100.00 (100.00)	700.00 (28.54)	700.00 (28.54)	100.00 (100.00)

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Sl No	Category-wise intervention	2007-08			2008-09			2009-10			2010-11			2011-12		
		Outlay	Exp.	Ach (%)	Outlay	Exp.	Ach. (%)	Outlay	Exp.	Ach (%)	Outlay	Exp.	Ach(%)	Outlay	Exp.	Ach (%)
6	**Cropping system based trainings**															
a)	F.F.S	13.60 (1.19)	13.60 (1.23)	100.00 (101.79)	63.24 (2.17)	62.90 (2.41)	99.46 111.12	85.00 (2.20)	22.10 (0.63)	26.00 (28.75)	76.50 (2.66)	76.50 (2.66)	100.00 (100.00)	0	0	0
b)	Publicity	15.60 (1.37)	15.60 (1.39)	100.00 (101.79)	126.00 (4.32)	10.30 (0.39)	8.17 (9.13)	0	0		26.00 (0.90)	26.00 (0.90)	100.00 (100.00)	32.69 (1.33)	32.69 (1.33)	100.00 (100.00)
c)	Misc. Expenditure	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
d)	PMT& Misc. Expenditure at HQ & District	96.55 (8.47)	76.55 (6.84)	79.29 (80.71)	96.55 (3.31)	96.55 (3.70)	100.00 (111.72)	96.55 (2.50)	96.55 (2.77)	100.00 (110.56)	96.55 (3.36)	96.55 (3.36)	100.00 (100.00)	96.55 (3.94)	96.55 (3.94)	100.00 (100.00)
7	**Local initiative**															
a)	STW	0	0	0	122.00 (4.19)	122.00 (4.68)	100.00 (111.72)	304.92 (7.90)	304.92 (8.37)	100.00 (110.56)	0	0	0	250.00 (10.19)	250.00 (10.19)	100.00 (100.00)
b)	Soil health map	200.00 (17.55)	200.00 (17.87)	100.00 (101.79)	0	0	0	0	0	0	0	0	0	0	0	0
c)	Pump set	0	0	0	0	146.00 (5.60)	0	33.30 (0.86)	33.30 (0.95)	100.00 (110.56)	0	0	0	0	0	0
d)	Vermi-compost	0	0	0	0	0	0	82.19 (2.13)	82.19 (2.35)	100.00 (110.56)	0	0	0	0	0	0
e)	Foundation seed production	0	0	0	0	0	0	19.00 (0.49)	19.00 (0.54)	100.00 (110.56)	10.00 (0.35)	10.00 (0.35)	100.00 (100.00)	0	0	0
f)	Seed bin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
g)	Distribution of containers for seed treatment	0	0	0	4.40 (0.15)	4.40 (0.17)	100.00 (111.72)	12.00 (0.31)	12.00 (0.34)	100.00 (110.56)	0	0	0	0	0	0
h)	Seed treating chemical	0	0	0	0.60 (0.02)	0.60 (0.02)	100.00 (111.72)	0.25 (0.01)	0.25 (0.01)	100.00 (110.56)	0	0	0	0	0	0
i)	Marker	0	0	0	0	0	0	35.00 (0.91)	35.00 (1.00)	100.00 (110.56)	23.15 (0.80)	23.15 0.80	100.00 (0.80)	0	0	0
j)	Paddy weeder	0	0	0	35.00 (1.20)	35.00 (1.34)	100.00 (111.72)	0	0	0	0	0	0	0	0	0
	Total	1139.42 (100.00)	1119.42 (100.00)	98.24 (100.00)	2914.65 (100.00)	2608.81 (100.00)	89.51 (100.00)	3859.5 (100.00)	3490.92 (100.00)	90.45 (100.00)	2876.99 (100.00)	2876.99 (100.00)	100.00 (100.00)	2452.96 (100.00)	2452.96 (100.00)	100.00 (100.00)

Note: Figures in parentheses indicate percentage to total Exp. → Expenditure Ach.--> Achievement

Source: Joint Director of Agriculture, State Nodel Office, NFSM, Assam

Table – 2.11
Category-wise interventions outlay & Expenditure of NFSM-Pulses for 11th FYP in Assam (2007-08 to 2011-12)

(Rs.in Lakh)

Sl No	Category-wise intervention	2007-08			2008-09			2009-10			2010-11			2011-12		
		Outlay	Exp.	Ach (%)	Outlay	Exp.	Ach. (%)	Outlay	Exp.	Ach. (%)	Outlay	Exp.	Ach. (%)	Outlay	Exp.	Ach. (%)
1	Seeds															
a)	Purchase of Breeder seeds from ICAR										0	0	0	4.19 (0.37)	4.19 (0.37)	100 (3.70)
b)	Production of foundation seed										0	0	0	18 (1.60)	18 (1.60)	100 (3.70)
c)	Production of certified seed										0	0	0	25 (2.22)	25 (2.22)	100 (3.70)
2	Distribution of certified seed										108 (14.03)	104.5 (13.67)	96.74 (6.57)	76.4 (6.78)	76.4 (6.78)	100 (3.70)
a)	Strengthening of SSCA										25 (3.25)	25 (3.27)	100 (6.79)	0	0	0
3)	Organization of Technology demonstration										10 (1.30)	10 (1.31)	100 (6.79)	0	0	0
4	Integrated nutrient management															
a)	Lime/Gypsum										52.5 (6.82)	52.5 (6.87)	100 (6.79)	15 (1.33)	15 (1.33)	100 (3.70)
b)	Micro-nutrient										35 (4.55)	35 (4.58)	100 (6.79)	10 (0.89)	10 (0.89)	100 3.70
c)	Assistance on R/CPSB										0	0	0	8 (0.71)	8 (0.71)	100 (3.70)
5	Integrated Pest Management															
a)	IPM										12 (1.56)	12 (1.57)	100 (6.79)	60 (5.32)	60 (5.32)	100 (3.70)
b)	P.P.Chemical										10 (1.30)	10 (1.31)	100 (6.79)	40 (3.55)	40 (3.55)	100 (3.70)
c)	Weedicide										0	0	0	4 (0.35)	4 (0.35)	100 (3.70)
6	Resource conservation technology/tools															
a)	Sprayer(Manual)										15 (1.95)	15 (1.96)	100 (6.79)	0	0	0
b)	Rotavator										6 (0.78)	4.5 (0.59)	75 5.10	15 (1.33)	15 (1.33)	100 (3.70)
7	Efficient water application tools															
a)	Pump set										190.5 (24.75)	190.5 (24.92)	100 (6.79)	10 (0.89)	10 (0.89)	100 (3.70)
b)	Sprinkler set										0	0	0	6 (0.53)	6 (0.53)	100 (3.70)

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Sl No	Category-wise intervention	2007-08			2008-09			2009-10			2010-11			2011-12		
		Outlay	Exp.	Ach (%)	Outlay	Exp.	Ach. (%)	Outlay	Exp.	Ach. (%)	Outlay	Exp.	Ach. (%)	Outlay	Exp.	Ach. (%)
c)	Pipe for carrying water										0	0	0	15 (1.33)	15 (1.33)	100 3.70
8	F.F.S.										5.95 (0.77)	5.95 (0.78)	100 (6.79)	6.8 (0.60)	6.8 0.60	100 (3.70)
9	PMT & Misc. Expenditure										50.98 (6.62)	50.98 (6.67)	100 (6.79)	50.98 (4.52)	50.98 4.52	100 (3.70)
10	Local initiative															
a)	STW										0	0	0	200 (17.74)	200 (17.74)	100 (3.70)
b)	Tarpauline										30 (3.90)	30 (3.99)	100 (6.79)	0	0	0
c)	Seed treating materials										0	0	0	4.56 (0.40)	4.56 (0.40)	100 (3.70)
d)	Bio-pesticides										0	0	0	13.44 (1.19)	13.44 (1.19)	100 (3.70)
e)	Water carrying pipe										0	0	0	150 (13.31)	150 (13.31)	100 (3.70)
1	Accelerated pulses production programme(A3P) Rabi															
i)	Lentil										109.32 14.21	109.3 14.30	100 (6.79)	150 (13.31)	150 (13.31)	100 (3.70)
ii)	Black gram										109.32 (14.21)	109.3 (14.52)	100 (6.79)	35 (3.10)	35 (3.10)	100 (3.70)
2	Additional area of Rabi pulse programme										0	0	0	0	0	0
3)	INM package										0	0	0	0	0	0
i)	Lime										0	0	0	62.7 (5.56)	62.7 (5.56)	100 (3.70)
ii)	Micro-nutrient										0	0	0	57 (5.06)	57 (5.06)	100 (3.70)
iii)	R/C&PSB										0	0	0	11.4 (1.01)	11.4 (1.01)	100 3.70
iv)	Vermi compost										0	0	0	11.4 (1.01)	11.4 (1.01)	100 (3.70)
4)	IPM Package										0	0	0	0	0	0
i)	Assistance on summer Moong /Black gram										0	0	0	67.5 (1.01)	67.5 (1.01)	100 (3.70)
	Total										769.57 (100.00)	764.53 (100.00)	1471.74 (100.00)	1127.37 (100.00)	1127.37 (100.00)	2700 (100.00)

Note: Figures in parentheses indicates percentage to total Exp. → Expenditure Ach.--> Achievement

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for liming materials), (Assistance for PP chemical& Bio-agents), and conoweeder were 85.03 per cent, 42.57 per cent and 74.51 per cent respectively. In all other interventions, achievement was 100 per cent. In 2009-10, outlay in intervention (incentive for Micro-nutrient) was highest (335 lakh) and lowest (0. 25) in intervention (Seed treating chemical). Achievement percentage except for interventions in 3(a): (incentive for Micro-nutrient), 3(b): (incentive for liming materials), 3(c): (Assistance for PP chemical& Bio-agents), 4(b): Manual sprayer, 4(c): Rotavator and 6(a):F.F.S were 100 per cent. In 2010-11 outlay in intervention 2(b): (Assistance for distribution of HYV seeds) was highest (500 lakh) and lowest (10 lakh each) in interventions 2(a): (Assistance for production of hybrid rice seeds) and 7(e) (Foundation seed production). In 2011-12 outlay in interventions 3(a): (incentive for Micro-nutrient), 3(b): (incentive for liming materials) and 7(a): STW were highest (250 lakh each) and lowest (20 lakh) in intervention 2(a): (Assistance for production of hybrid rice seeds) .Achievement per cent in all interventions were 100 per cent in both the years.

Category-wise interventions outlay and expenditure of NFSM-pulses are presented in Table-2.8(b). Interventions on NFSM-pulses were-

1. Seed- a) Purchase of Breeder seeds from ICAR, b) Production of foundation seed, c) Production of certified seeds,
2. Distribution of certified seeds,-a) Strengthening of SSCA
3. Organization of Technology demonstration
4. Integrated nutrient management (INM)- a) Lime/Gypsum, b) Micro-nutrient, c) Assistance on R/CPSB
5. Integrated pest management –a) IPM, b) P. P. Chemical, c) Weedicide
6. Resource conservation Technology/tools –a) Sprayer (manual), b) Rotavator
7. Efficient water application tools – a) pump set, b) sprinkler set, c) pipe for carrying water
8. Farmers Field School
9. PMT & Misc. Expenditure
10. Local Initiative –a) STW, b) Tarpaulin, c) Seed treating materials, d) Bio-pesticides and e) Water carrying pipe

Accelerated pulses production programme (A3p) Rabi

i) Lentil, ii) Black-gram

2. Additional area of Rabi pulses programme

3. INM package, i) Lime, ii) Micro-nutrient, iii) R/C & PSB, iv) Vermi compost

4. IPM package –i) Assistance on summer Mung/Black gram

It is seen from the Table-2.8(b) that in 2010-11, outlay in intervention 7(a): Pump set was highest (190 lakh) and lowest (5.95 lakh) in intervention 8:F.F.S. Achievement per centage in intervention 2: Distribution of certified seeds and 6(b) Rotavator were 96.74 per cent and 75 per cent respectively. In all other interventions, achievement was 100 per cent. In 2011-12, outlay in intervention 10(a) STW was highest (200 lakh) and lowest (4 lakh) in intervention 5 (c) Weedicide. In all the interventions, achievement was 100 per cent.

2. 6 Correlation between per cent change in NFSM expenditure and per cent change in seeds, fertilizer consumption, irrigated area, area and production of paddy

Table-2.12 shows the correlation between per cent change in NFSM expenditure and irrigation/fertilizer in Assam. The correlation coefficient between percentage change of total NFSM expenditure and percentage change of net irrigated area was found to be 0.07 which indicates that there is positive impact between these two variables.

Table-2. 12

Correlation between Per Cent Changes in NFSM Expenditure and Irrigation/ Fertilizer in Assam

Year	% Total NFSM Expenditure	% of Net Irrigated Area (in ha.)	% Fertilizer Consumption (in ha)
Change over 2008-09	137.46	66.92	-1.00
Change over 2009-10	33.65	-28.28	6.05
Change over 2010-11	62.93	12.15	3.11
Change over 2011-12	-57.17	-0.09	11.75
Correlation Coefficient		0.07	-0.18

N. A --> Not Applicable

In case of correlation between percentage change in NFSM expenditure and fertilizer consumption was found at -0.18 which indicates that the expenditure on NFSM has a negative impact on consumption of fertilizer.

Table-2.13 shows the correlation between percentage changes in NFSM

Table-2. 13
Correlation between Per Cent Changes in NFSM Expenditure and Area and Production of Paddy

Year	% Total NFSM Expenditure	% of Area (Lakh. ha.)	% Change of Production000' tonne
Change over 2008-09	137.46	6.88	22.65
Change over 2009-10	33.65	1.85	8.21
Change over 2010-11	62.93	1.38	14.16
Change over 2011-12	-57.17	-1.83	-6.85
Correlation Coefficient		0. 97	0.98

N. A --> Not Applicable

expenditure and area and production of paddy. It is seen that correlation between percentage change in NFSM expenditure and area was found at 0.97which indicates that the expenditure on NFSM has a positive impact on area of paddy cultivation. In case of correlation between percentage change in NFSM expenditure and production (000, tonne) was recorded at 0.98 which indicates that the expenditure on NFSM has a positive impact on production of paddy as well.

2. 7: Summary of the chapter II

This chapter visualises that after launching of NFSM paddy (in 2007-08) and NFSM-pulses (in 2010-11) the area, production and yield of paddy and pulses started increasing in the state. In case of growth of paddy and pulses it was seen that AGR of production and productivity in Non-NFSM paddy and pulses were in higher side. It may be due to: i) delay in input supply specially; seed and ii) Other programmes run already in the Non-NFSM districts. iii) Besides a biotic factors cannot be denied also.

The average AGR in area, production and yield of paddy in NFSM districts during 9^{th} plan period were 0.36 per cent, 2.75 per cent and 2.16 per cent, respectively. During 10^{th} plan period, the AGR in area, production and yield were negative. During 11^{th} plan period, the AGR in area, production and yield were 3.09 per cent, 11.81 per cent and 8.34 per cent, respectively. The total average AGR in area, production and yield of paddy in non- NFSM districts during 9^{th} plan period were -0.21 per cent, 2.58 per cent and 5.24 per cent, respectively. During 10^{th} plan period the AGR in production and yield were negative. During 11^{th} plan period, the AGR in area, production and yield were 2.69 per cent, 2.69 per cent and 6.06 per cent, respectively.

Average AGR in area, production and yield of pulses in NFSM districts during 9th plan period were 4.56 per cent, 6.43 per cent and -0.81 per cent, respectively. During 10th plan period average the AGR in area and production were negative. The average AGR in area, production and yield of pulses during 11th plan period were 4.87 per cent, 4.42 per cent and 0.43 per cent, respectively. Average AGR in area, production and yield of pulses during 11th plan period was higher in non-NFSM districts than that of NFSM districts. After launching of NFSM in 2007, irrigation intensity, cropping intensity and fertiliser consumption were found to be increasing. From the overall analysis, it can be clearly observed that NFSM has positive impact on food grains production and pulses production as well.

Financial progress against NFSM-Rice and NFSM-Pulses in Assam was found satisfactory. The average AGR of amount released, amount targeted and achievement for total NFSM (Rice & Pulses) were Rs.4125.63 lakh, Rs.4303.74 lakh and Rs.3555.49 lakh respectively and the percentage of achievement stood at 82.61.

The correlation coefficient between percentage change of total NFSM expenditure and percentage change of net irrigated area indicates that there is no significant impact between these two variables. The correlation between percentage change in NFSM expenditure and production indicates that the expenditure of NFSM has a positive impact on production of paddy.

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Chapter III

Households Characteristics, Cropping Pattern and production structure

3.1 Socio-economic profile of the sample households

In this chapter an attempt has been made to analyse the socio-economic profile of the sample households based on the primary level data. The economic conditions, educational levels, ownership of land holding and land utilization patterns together form the socio-economic profile of the sample farmers The demographic features, occupational distribution, sources of income, asset position etc, also determine the economic status of the farm families and may provide information on the aptitude of the farmers towards adoption of new farm technology. So, it is very important for studying the socio-economic profile of the population under study.

3.1.1 Demographic profile

Demographic pattern is one of the important features of a farming community as it is the primary source of labour for crop cultivation. Therefore, a proper appraisal of its size, growth composition and quality is considered as pre requisite for an effective planning for balanced and sustainable socio-economic development.

The socio economic profile of the sample households is presented in Table-3.1. The total number of household surveyed was 400, of which 300 were beneficiary households and 100 non-beneficiary households. The average family size was found at 6 person per household for both beneficiary and non-beneficiary sample households. The average number of household members engaged in farming was found at 43.58 per cent and 41.78 per cent respectively in NFSM and non-NFSM farm families. The percentage of male respondents was found to be 99.67 per cent and 100 per cent in NFSM and non-NFSM sample households, respectively. The percentage of adult male above 15 years of age was 38.14 per cent in NFSM and 38.11 per cent in non-NFSM farm families. The percentage of adult female above 15 years of age was 32.33 per cent and 30.07 per cent in NFSM and non-NFSM, respectively. Again, the percentage of population below 15 years of age was 29.53 per cent and 31.82 per cent in NFSM and non-NFSM, respectively.

Table 3.1
Socio-Economic Profile of the Sample HH (% of HH)

Characteristics			NFSM	Non-NFSM
Total households surveyed: numbers			300	100
Household size: numbers			6.31	5.72
% of HH members engaged in farming			43.58	41.78
Gender of the Respondent (%)		Male	99.67	100.00
		Female	0.33	0.00
Age group of the members (%)		Adult Males (>15 yrs)	38.14	38.11
		Adult Females (>15 yrs)	32.33	30.07
		Children (<15 yrs)	29.53	31.82
Education status of the family members (%)		Illiterate	11.33	14.00
		Primary	23.00	34.00
		Middle	38.00	32.00
		Matriculation/secondary	19.00	15.00
		Higher secondary	7.00	5.00
		Degree/Diploma	1.67	0.00
		Above Degree	0.00	0.00
Caste of households (%)		SC	0.67	0.00
		ST	1.33	2.00
		OBC	47.67	50.00
		General	50.33	48.00
Occupation income (Rs./annum/HH)		Only agriculture	84,985.52	51,700.97
		Own business	4,959.33	2,591.00
		Salaried/pensioners	12,444.24	9,198.40
		Wage earners	2,717.37	3,315.10
		Others*	8,176.67	4,796.00
		Average annual income from all sources	113,283.12	71,601.47
Net operated area	% of area	Marginal (0.1 to 2.5 ac)	17.46	28.44
		Small (2.51 to 5 ac)	40.55	39.19
		Medium (5.1 to 10 ac)	30.81	32.37
		Large (10.1 and above)	11.18	0.00
	% of holdings	Marginal (0.1 to 2.5 ac)	34.00	50.00
		Small (2.51 to 5 ac)	44.00	34.00
		Medium (5.1 to 10 ac)	18.67	16.00
		Large (10.1 and above)	3.33	0.00
	Average size	Total (acres)	3.90	3.11

3.1.2 Educational status

Education is one of the most important factors which determine the quality of manpower. The level of education plays an important role on quality of human resources engaged in productive activities including agriculture. It has great influence on adoption of modern technology in the sense that the level of awareness or the acceptability of new proposition, by and large, depends on the educational level of the people.

From the Table-3.1 it is seen that, of the total family members, 11.33 per cent were illiterate, 23 per cent had education up to primary level, 38 per cent had education up to middle standard, 19 per cent read up to matriculation, 7 per cent passed higher-secondary and only 1.67 per cent are graduate .There were no post graduate degree holders in the sample households.

Of the total households, only 0.67 per cent was SC population, 1.33 per cent ST population, 47.67 per cent OBC population and 50.33 per cent belonged to general category population in NFSM households. On the other hand, of the total households only 2.00 per cent were ST population, 50.00 per cent OBC and 48 per cent general population in non-NFSM households. There was no SC population in non-NFSM households.

3.1.3 Annual income of the sample households

The total annual income per household from agriculture was found at Rs 84,986, Rs 4,959 from business, Rs 12,444 from salaried job, Rs.2, 717 from wage earners and Rs 8,177 from other sources like fruits, vegetables, jute & Mesta, plantation crops and tea. The average annual income from all sources stood at Rs 1, 13,283 in NFSM households. In case of non-NFSM households income from agriculture was found at Rs 51,701, Rs 2,591 from business, Rs 9,198 from salaried job, Rs 3,315 from wage earners and Rs 4,796 from other sources. The average annual income from all sources stood at Rs 71,601.

3.2 Characteristics of operational holding

Land is the basic input which provides food, employment and income to the farming community. Land resource plays a vital role in determination of economic and social progress of the people. Economic upliftment in the rural areas to a great extent depends on the availability of suitable land resources. The Characteristics of operational holdings of sample households in the study area are presented in Table-3.2. It is seen from the Table that total owned land was 1,035.60 acres in NFSM and 288.70 acres in non-NFSM households and per household holding stood at 3.45 acre and 2.89 acres in NFSM and non-NFSM households, respectively. Per household uncultivated land was found at 0.17 acres and 0.18 acres in NFSM and non-NFSM districts, respectively. Per household own cultivated land stood at 3.28 acres and 2.71 acres in NFSM and non-NFSM area, respectively. Per household leased-in land was found at 0.67 acres in NFSM and 0.42 acres in Non-NFSM farm families. Per household leased-out land was found at 0.05 acres and

Table 3.2
Characteristics of operational holdings of sample HH (acres per HH)

Land details	NFSM	Non-NFSM
1. Total owned land	1035.60 (3.45)	288.70 (2.89)
2. Un-cultivated land/Fallow land	51.17 (0.17)	18.11 (0.18)
3. Cultivated land (Own)	984.43 (3.28)	270.59 (2.71)
4. Leased-in land	199.67 (0.67)	42.32 (0.42)
5. Leased-out land	15.53 (0.05)	1.65 (0.02)
6. Net Operated Area(3+4 - 5)	1168.57 (3.90)	311.26 (3.11)
7. Cropping Intensity (%)	139	132
8. Irrigation Intensity (%)	177	194
9. Net operated area per HH	3.90	3.11
10. Total owned land per HH	3.45	2.89

Note: *Cropping Intensity= (Gross Cropped Area/Net Cropped Area)*100
**Irrigation Intensity= (Gross Irrigated Area/Net Irrigated Area)*100
***Figures in the parenthesis indicates acre per HH

0.02 acres in NFSM and non-NFSM respectively. Per household net operated area was 3.90 acres and cropping intensity stood at 139 per cent, irrigation intensity at 177 per cent, under NFSM. In non-NFSM farms per household net operated area was 3.11 acres and cropping intensity stood at 132 per cent, irrigation intensity at 194 per cent. The irrigation intensity was found to be higher in non-NFSM farms as compared to NFSM farms.

3.3 Sources of Irrigation and Structure of Tenancy

Irrigation is one of the most vital inputs in modern agriculture. For development of agriculture sector, availability of assured irrigation facility bears much significance. It is important in the context of increasing the agricultural production to meet the growing requirements. The three major systems of irrigation – canal irrigation, well irrigation and tank irrigation are adopted in Assam. Table-3.3 shows the distribution of area by source of irrigation (percentage to the total area). In the sample NFSM area there were only two types of irrigation sources cannel and tube well (electric/ diesel). Of the total irrigated area only 0.99 acres (0.08 per cent) was under canal irrigation, 512.47 acres (43.85 per cent) were under tube well irrigation and 655.10 acres (56.06 per cent) area were rainfed. Total irrigated area per household stood at 1.71 acres and total rainfed area per household stood at 2.18 acres for NFSM households. There was only tube well irrigation system in the non-NFSM sample area. Of the total area, 91.9 acres (29.52 per cent) are irrigated and 219.39

Table 3.3
Distribution of Area by Source of Irrigation

(% to the total area)

Land details	NFSM	Non-NFSM
Only Canal	0.99 (0.08)	0.00 (0.00)
Only tubewell (Electric/diesel)	512.47 (43.85)	91.9 (29.52)
Canal+ tubewell (Electric/diesel)	0.00 (0.00)	0.00 (0.00)
Tank and others (Open well)	0.00 (0.00)	0.00 (0.00)
Rainfed area	655.10 (56.06)	219.39 (70.48)
Total irrigated area per hh (acres)	1.71	0.92
Total rainfed area per hh (acres)	2.18	2.19

Note: Figures in the parenthesis indicates percentage to the total

acres (70.48 per cent) are rain fed area. Total irrigated area per household stood at 0.92 acres and total rain fed area per household stood at 2.19 acres in Non-NFSM areas.

Table-3.4 shows the nature of tenancy in the study area. It is seen that there are two types of leasing-in and leasing-out terms, share cropping and fixed rent in cash. In NFSM sample area, there were 13.25 per cent share cropping area and 83.77 per cent fixed rent area in leased-in land, as against 14.87 per cent share cropping and 85.13 per cent fixed rent area

Table 3.4
Nature of Tenancy in Leasing-in/Leasing-out Land

(% to the total leased-in/leased-out area)

Terms of leasing	NFSM		Non-NFSM	
	Leasing-in	Leasing-out	Leasing-in	Leasing-out
Share cropping	13.25	14.87	14.06	80.00
Fixed rent in cash	83.77 (4,741)	85.13 (4,312)	85.94 (5,593)	20.00 (6,061)
Fixed rent in kind	2.98	0.00	0.00	0.00
Both (cash and kind)	0.00	0.00	0.00	0.00
Against labour	0.00	0.00	0.00	0.00
Others	0.00	0.00	0.00	0.00
Aggregate	100.00	100.00	100.00	100.00

***Note**: In case of fixed rent total value of cash/kind paid / received for leasing-in / out (Rs/acre) in the parenthesis.*

in leased-out land. In non- NFSM sample area, there were 14.06 per cent share cropping area and 85.94 per cent fixed rent area in leased-in land and 80.00 per cent share cropping and 20.00 per cent fixed rent area under leased-out land.

3.4 Cropping Pattern and per acre Costs and Returns

Cropping pattern reflects the relative dominance of individual crops to total cropped area. The cropping pattern of the sample household is presented in Table-3.5. Here

it was tried to work out the percentage of area under different crops to the total gross cropped area. The Table shows that out of the total gross cropped area (1,622.23 acres),

Table 3.5
Cropping pattern of sample HH (% of Gross Cropped Area)

(% of Gross Cropped Area)

Name of the Crop	NFSM	Non-NFSM
Cereals		
Paddy	66.75	77.90
Wheat		
Maize		
Jowar		
Bajra		
Ragi		
Minor Cereals		
Pulses		
Tur	0.05	0.02
Gram	4.20	3.54
Other pulses		
Oilseeds		
Groundnut		
Sunflower		
Soyabean		
Rape & Mustard	5.16	3.70
Other Oilseeds		
Others		
Cotton		
Jute & Mesta	3.74	2.05
Sugarcane		
Fruits	0.29	0.32
Vegetables	11.44	6.92
Flowers		
Spices		
Plantation	2.35	2.14
Fodder		
Forest species		
Others (Tea)	6.02	3.41

total cereal crop, paddy covered 66.75 per cent area under NFSM. Under pulse cultivation, Tur covered 0.05 per cent and Gram covered 4.20 per cent. Under oilseeds cultivation, Rape and Mustard covered 5.16 per cent area. Under other crop cultivation, Jute and Mesta covered 3.74 per cent area, Fruits covered 0.29 per cent, Vegetables covered 11.44 per cent, Plantation crops covered 2.35 per cent and Tea covered 6.02 per cent of the gross cropped area.

In non-NFSM farms out of the total gross cropped area (411.54 acres), paddy covered 77.90 per cent area. Under pulse cultivation, tur covered 0.02 per cent and gram

covered 3.54 per cent area. Under oilseeds cultivation Rape and Mustard covered 3.70 per cent and under other crop cultivation Jute and Mesta covered 2.05 per cent, Fruits covered 0.32 per cent, Vegetables covered 6.92 per cent, Plantation crops covered 2.14 per cent and Tea covered 3.41 per cent of the gross cropped area.

Table-3.6(a) shows the household income from agricultural and non agricultural sources. The Table shows that the value of output (main and by product) per household was Rs 1,39,047 and per acre value of output was Rs 35,697 in NFSM farms. Per household cost of production was Rs 54,061 and per acre cost of production was Rs 13,879, net return per household (farm business income) was Rs 84,986 and per acre net return was Rs 21,818. Non-farm income per household stood at Rs 28,298 and per acre non farm income stood at Rs 7,265. Total per household income from all sources stood at Rs 1, 13,283 and per acre total income stood at Rs 29,082. In non-NFSM farms, the value of output (main and by product) per household was Rs 91,903 and per acre value of output was Rs 29,526. Per household cost of production was Rs 40,202 and per acre cost of production was Rs 12,916, net

Table 3.6 (a)
Household Income from Agricultural and Non Agricultural Sources

Costs and returns particulars	NFSM		Non-NFSM	
	Rs. per household	Rs. per acre	Rs. per household	Rs. per acre
Value of output (main + by-product)	139,047	35,697	91,903	29,526
Cost of production	54,061	13,879	40,202	12,916
Net returns (Farm business income)	84,986	21,818	51,701	16,610
Non-farm income	28,298	7,265	19,901	6,394
Total income	113,283	29,082	71,601	23,004

return per household (farm business income) was Rs 51,701 and per acre net return was Rs 16,610. Non-farm income per household stood at Rs 19,901 and per acre non farm income stood at Rs 6394. Total per household income from all sources stood at Rs 71,601 and per acre total income stood at Rs 23,004.It is seen from the Table-3.6(a) that the total income and net return in NFSM farms were higher than that of non-NFSM. So it may be said that the impact of NFSM on crop production was positive.

Crop wise per acre costs and return among the sample households are presented in Table-3.6(b). The per acre productivity, gross return, cost of cultivation and net return of

NFSM paddy were 12.26 qtl/acre, Rs 15,437.22 /acre , Rs 9,485.29 /acre and Rs 5,951.93 /acre respectively. The per acre productivity, gross return, cost of cultivation and net return

Table 3.6 (b)
Crop wise Per acre costs and returns among the sample HHs

Name of the Crop	NFSM				Non-NFSM			
	Yield	Gross returns	Cost of cultivation	Net Returns	Yield	Gross returns	Cost of cultivation	Net Returns
	(Qtls/ acre)	(Rs. / acre)	(Rs. / acre)	(Rs. / acre)	(Qtls/ acre)	(Rs. / acre)	(Rs. / acre)	(Rs. / acre)
Cereals								
Paddy	12.26	15,437.22	9,485.29	5,951.93	12.64	15,889.02	9,508.73	6,380.29
Wheat								
Jowar								
Bajra								
Maize								
Ragi								
Minor Cereals								
Pulses								
Tur	13.78	55,038.24	9,566.18	45,472.06	14.00	56,000.00	10,444.44	45,555.56
Gram	3.18	11,085.22	5,329.51	5,755.71	2.56	9,040.78	4,557.89	4,482.89
Other pulses								
Oilseeds								
Groundnut								
Sunflower								
Soyabean								
Rape & Mustard	4.90	12,737.77	5,168.53	7,569.24	3.21	8,388.79	5,237.85	3,150.93
Other Oilseeds								
Others								
Cotton								
Jute & Mesta	15.94	30,553.89	7,317.83	23,236.05	13.71	27,422.28	7,971.76	19,450.51
Sugarcane								
Fruits	43.71	30,290.11	4,110.33	26,179.77	43.01	29,528.84	4,855.29	24,673.56
Vegetables	28.33	28,653.43	9,132.34	19,521.09	28.35	27,439.90	9,206.28	18,233.63
Flowers								
Spices								
Plantation	26.75	97,489.34	7,340.69	90,148.65	25.67	93,486.01	7,649.66	85,836.35
Fodder								
Forest species								
Others (Tea)	48.19	119,699.02	27,710.79	91,988.23	51.77	129,111.96	30,015.71	99,096.25

of non-NFSM paddy were 12.64 qtl/acre ,Rs 15,889.02 /acre, Rs 9,508.73 /acre and Rs 6,380.29 /acre. It is seen that the per acre productivity, gross return, cost of cultivation and net return were higher in non-NFSM farms. It may be due to inclusion of all paddy in calculation. Though non-beneficiary farmers were not availing NFSM benefits but they were availing benefits from other programmes like RKVY. They also used proper inputs in paddy cultivation and their soil fertility may be better.

The per acre productivity of Tur stood at 13.78 qtl in NFSM and 14.00 qtl in non-NFSM farms. Gross return per acre stood at Rs 55,038.24 in NFSM and Rs 56,000.00 in non-NFSM farms. Per acre cost of cultivation stood at Rs 9,566.18 in NFSM and Rs

10,444.44 in non-NFSM farms. Net return per acre stood at Rs 45,472.06 in NFSM and Rs 45,555.56 in non-NFSM sample farmers. The per acre productivity of Gram stood at 3.18 qtl in NFSM and 2.56 qtl in non-NFSM farms. Gross return per acre stood at Rs 11,085.22 in NFSM and Rs 9,040.78 in non-NFSM sample farms. Per acre cost of cultivation stood at Rs 5329.51 in NFSM and Rs 4,557.89 in non-NFSM, Net return per acre stood at Rs 5,755.71 in NFSM and Rs 4,482.89 in non-NFSM farms.

The per acre productivity of oilseeds (Rape &Mustard) stood at 4.90 qtl in NFSM and 3.21 qtl in non-NFSM, Gross return per acre stood at Rs 12,737.77 in NFSM and Rs 8,388.79 in non-NFSM, Per acre cost of cultivation stood at Rs 5,168.53 in NFSM and Rs 5,237.85 in non-NFSM, Net return per acre stood at Rs 7,569.24 in NFSM and Rs 3,150.93 in non-NFSM farms. For other crops, the per acre productivity of jute and Mesta stood at 15.94 qtl in NFSM and 13.71 qtl in non-NFSM, Net return stood at Rs 23,236.05 per acre in NFSM and Rs 19,450.51 per acre in non-NFSM.

The per acre productivity of fruits stood at 43.71 qtl in NFSM and 43.01 qtl in non-NFSM, net return stood at Rs 26,179.77 per acre in NFSM and Rs 24,673.56 per acre in non-NFSM. The per acre productivity of vegetables was found at 28.33 qtl in NFSM and 28.35 qtl in non-NFSM, net return stood at Rs 19,521.09 per acre in NFSM and Rs 18,233.63 per acre in non-NFSM. The per acre productivity of plantation crops stood at 26.75 qtl in NFSM and 25.67 qtl in non-NFSM ,net return stood at Rs 90,148.65 per acre in NFSM and Rs 85,836.35 per acre in non-NFSM. The per acre productivity of tea was found at 48.19 qtl in NFSM and 51.77 qtl in non-NFSM, net return stood at Rs 91,988.23 per acre in NFSM and Rs 99,096.25 per acre in non-NFSM. It may be due to newly planted tea area in NFSM sample farms.

3.5 Assets holdings

Asset holding reflects the economic condition of the farm family. From the assets position it is possible to know how much they are economically sound. So, it is necessary to analyse the assets holding of the farm family. Table-3.7 shows the farm assets holding in possession of the sample households. Under land development, tillage and seed bed preparation equipments, power tiller occupied highest position (Rs 8,936.67 per household) ,followed by tractor (Rs 1,233.33 per household) and ploughs (Rs 505 per household) in

NFSM farms. In non-NFSM sample households there was only two equipments- power tiller and ploughs. Power tiller occupied first position (Rs 2,630 per household) and ploughs.

Table 3.7
Farm assets holding by sample HHs (Rs./HH)

Equipment code	Implements	NFSM	Non-NFSM
		Value (Rs.)	Value (Rs.)
Land development, tillage and seed bed preparation equipments (1 to 7)			
1	Tractor/mini tractor (with Tiller/Cultivator)	1,233.33	0.00
2	Rotavator	0.00	0.00
3	Power Tiller	8,936.67	2,630.00
4	Cultivators	0.00	0.00
5	Ploughs (wooden/ MB)	505.00	820.50
6	Harrow	0.00	0.00
7	Others	0.00	0.00
Sowing and Planting equipments (8 to 13)			
8	Seed drill	0.00	0.00
9	Drum seeder	0.00	0.00
10	Transplantor	0.00	0.00
11	Furrow opener	0.00	0.00
12	Seed cum fertilizer drill	0.00	0.00
13	Others	0.00	0.00
Plant protection equipments (14 & 15)			
14	Sprayers	539.95	403.10
15	Other Plant protection equipments (Weeder)	91.67	41.50
Harvesting and threshing equipments (16 to 20)			
16	Cutters	0.00	0.00
17	Harvesters	0.00	0.00
18	Thresher	0.00	0.00
19	Laveller blade	0.00	0.00
20	Others	0.00	0.00
Equipments for residue management (21 to 23)			
21	Brush cutter	0.00	0.00
22	crusher	0.00	0.00
23	Others	0.00	0.00
Post harvest and agro-processing machines (24 & 25)			
24	Chopper	0.00	0.00
25	Others	0.00	0.00
Water lifting implements (26 to 28)			
26	Pumpset	10,095.67	3,430.00
27	Sprinkler	0.00	0.00
28	Others	0.00	0.00
Others			
29	Others	6,478.71	4,933.90
Grand Total		27,880.99	12,259.00

occupied second position (Rs 820.50 per household) .There was no any sowing and planting equipments in NFSM and non-NFSM farms. Under plant protection equipments, sprayer

occupied first position (Rs 539.95/hh) in NFSM and Rs 403.10/hh in non-NFSM farms and weeder occupied second position (Rs 91.67/hh) in NFSM and Rs 41.50/hh in non-NFSM households. No equipments have been reported to be used in harvesting, threshing, residue management, post harvest management and processing activities under NFSM and non-NFSM sample households. Under water lifting implements, there were only pump sets. The value of pump set per household was Rs 10,095.67 in NFSM and Rs 3,430.00 in non-NFSM farms. The value of other assets per household stood at Rs 6,478.71 in NFSM and Rs 4,933.90 in non-NFSM farms. Total value of all the farm assets stood at Rs 27,880.99 in NFSM and Rs 12,259.00 in non-NFSM farms. Thus it may be concluded that the economic condition of the sample farmers under NFSM are better than that of non-NFSM farmers.

3.6 Sources and purpose of credit

Without Government intervention and easy farm credits, it is difficult for a common farmer to aspire for marked progress in agriculture. So, it is necessary to analyse the sources and purpose of credit which reflect the economic condition of the farm family. Table-3.8 shows the details of sources of credit by the sample households. It is seen from

Table 3.8

Details of source of credit by the sample HHs

Source of credit	NFSM		Non-NFSM	
	No. of HH of the total in %	Outstanding amount (Rs/hh)	No. of HH of the total in %	Outstanding amount (Rs/hh)
Commercial Banks	16.33	36,208.16	9.00	13,888.89
PACS				
Government Agency				
Intermediaries/Informal				
1. Local Money Lender	0.33	5,000.00	0.00	0.00
2				
3				
4				

the table that of the total households, 16.33 per cent household availed credits from the commercial Banks and amount of outstanding loan per household was Rs 36,208.16 in NFSM. In non-NFSM farm households only 9.00 per cent household availed credit from the commercial banks and amount of outstanding loan per household was Rs 13,888.89. There was also informal credit inflow among the sample farmers. In NFSM sample households,

0.33 per cent household availed informal credit from local money lenders and outstanding amount was Rs 5,000 per household. The non-NFSM farmers did not avail informal credit.

Table-3.9 shows the details of purpose of credit by sample households. It is observed that the sample households took credit for both productive and non productive uses. In case of NFSM farms, for productive use, Agricultural credit stood at Rs 31,129.17 per household and other credit stood at Rs 2,80,000 for non productive use other credit stood at Rs 5,000.00 and the overall credit per household stood at Rs 36,208.16. In non-NFSM farms, there was only agricultural credit which stood at Rs 13, 888.89 per household.

Table 3.9
Details of purpose of credit by the sample HHs (Rs./HH)

Purposes	Purpose of credit	NFSM	Non-NFSM
		Rs. per HH	Rs. per HH
Productive uses	Agriculture	31,129.17	13,888.89
	Animal Husbandry	0.00	0.00
	Others	2,80,000.00	0.00
	Total	36,208.16	13,888.89
Non productive uses	Daily consumption	0.00	0.00
	Social	0.00	0.00
	Others (educational)	5,000.00	0.00
	Total	0.00	0.00

3.7 Summary of the chapter

The total number of household surveyed was 400 of which 300 beneficiary household and 100 non-beneficiary households. The average family size was found at 6 persons per household. The average number of household member engaged in farming was recorded at 43.58 per cent and 41.78 per cent in NFSM and non-NFSM farm families respectively. Of the total family members, 11.33 per cent were illiterate, 23 per cent had education up to primary level, 38 per cent had education up to middle standard, 19 per cent passed matriculation, 7 per cent passed higher-secondary and only 1.67 per cent were graduate .There were no post graduate degree holders amongst the sample households.

Of the total households only 0.67 per cent belonged to SC category, 1.33 per cent ST category, 47.67 per cent OBC and 50.33 per cent were general by cast in NFSM households. Of the total households only 2.00 per cent were ST population, 50.00 per cent belonged to OBC and 48 per cent were general by cast in non-NFSM households. There were no SC population in non-NFSM households. The total annual per household income

from agriculture was recorded at Rs 84,986 and Rs 51,701 in NFSM and in non-NFSM farms, respectively. The average annual income from all sources stood at Rs 1, 13,283 and Rs 71,601 in NFSM and in non-NFSM farms, respectively.

The total owned land was 1,035.60 acres in NFSM and 288.70 acres in non-NFSM households and per household holding stood at 3.45 acre and 2.89 acres in NFSM and non-NFSM farms respectively. Per household net operated area stood at 3.90 acres and cropping intensity stood at 139 per cent irrigation intensity 177 per cent, in NFSM farms. In non-NFSM households per household net operated area was recorded at 3.11 acres and cropping intensity stood at 132per cent and irrigation intensity stood at 194 per cent. The three major systems of irrigation – canal irrigation, well irrigation and tank irrigation are adopted in Assam.

Of the total irrigated area, only 0.99 acres (0.08 per cent) was under canal irrigation, 512.47 acres (43.85 per cent) under tube well irrigation and 655.10 acres (56.06 per cent) area were rainfed in NFSM farms. Only tube well irrigation system was seen in the non-NFSM sample area. Of the total area, 91.9 acres (29.52 per cent) were irrigated and 219.39 acres (70.48 per cent) were rainfed. There were two types of leasing-in and leasing-out terms -share cropping and fixed rent in cash. In NFSM sample area, there were 13.25 per cent share cropping area and 83.77 per cent fixed rent area in leased-in land and 14.87 per cent share cropping and 85.13 per cent fixed rent area in leased-out land. In non- NFSM sample area, there were 14.06 per cent share cropping area and 85.94 per cent fixed rent area in leased-in land and 80.00 per cent share cropping and 20.00 per cent fixed rent area in leased-out land.

Of the total gross cropped area (1,622.23 acres), total cereal crop (paddy) covered 66.75 per cent area under NFSM farms and in non-NFSM households; paddy covered 77.90 per cent of the total gross cropped area of 411.54 acres.

Among the NFSM farm households, net return per household (farm business income) was Rs 84,986 and per acre net return was Rs 15,716. Non-farm income per household stood at Rs 28,298 and per acre non farm income stood at Rs 5,233. Total per household income from all sources stood at Rs 1, 13,283 and per acre total income stood at Rs 20,950. In non-NFSM area net return per household (farm business income) was Rs 51,701 and per acre net return was Rs 12,563. Non-farm income per household stood at Rs

19,901 and per acre non farm income was recorded at Rs 4,836. Total per household income from all sources stood at Rs 71,601 and per acre total income stood at Rs 17,398. The per acre productivity, gross return, cost of cultivation and net return of NFSM paddy were 12.26 qtl/acre, Rs 15,437.22/acre , Rs 9,485.29/acre and Rs 5,951.93/acre, respectively. The per acre productivity, gross return, cost of cultivation and net return of non-NFSM paddy were 12.64 qtl/acre, Rs 15,889.02 /acre, Rs 9508.73 /acre and Rs 6380.29/acre respectively.

Total value of all the farm assets stood at Rs 27,880.99 in NFSM and Rs 12,259.00 in non-NFSM sample households.

Of the total households, 16.33 per cent household availed credit from Commercial Banks and the amount of outstanding loan per household was Rs 36,208.16 in NFSM households. In non-NFSM sample farms, only 9.00 per cent household availed credit from Commercial Banks and the amount of outstanding loan per household was Rs 13,888.89. There was also informal credit availed by the sample farmers. In case of NFSM 0.33 per cent household availed informal credit and outstanding amount was Rs 5,000 per household. All the sample households took credit for productive uses only. Agricultural credit stood at Rs 31,129.17 per household and other credit stood at Rs 2,80,000.00 per household and the overall credit per household stood at Rs 36,208.16. In non-NFSM households, there was only agricultural credit which stood at Rs 13, 888.89 per household.

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CHAPTER – IV
NFSM Interventions and its impact on farming

4.1 Awareness of NFSM

In this chapter an attempt has been made to analyse NFSM interventions and its impact on farming. Farmers' awareness is the main key for proper implementation of agricultural development programme.

The NFSM scheme is set to target the select districts by making available the improved technologies to the farmers through a series of planned interventions.The Mission interventions include demonstration of improved packages of practices, distribution of certified seed for increase in Seed Replacement Rate (SRR), integrated nutrient management, integrated pest management, farm mechanization, soil amelioration, farmers field school based training, *etc*.

Table-4.1(a) shows the awareness of NFSM among the sample beneficiaries. It has been observed that 100 per cent of the sample beneficiary farmers were aware of the NFSM-its aims & objectives and expected benefits

Table 4.1(a)
Awareness of NFSM among the sample beneficiaries

(in per cent)

Details of awareness	Assam
Beneficiaries aware about the NFSM	100.00
Beneficiaries not aware about the NFSM	0.00
Beneficiaries who did not reply	0.00

Table - 4.1(b) shows the sources of awareness of NFSM among the sample beneficiaries. It

Table 4.1(b)
Sources of awareness of NFSM among the sample beneficiaries

Sl. No.	Sources of Awareness	% of beneficiaries aware about NFSM
1	Newspaper	0.00
2	Agriculture Deptt.	100.00
3	State Agricultural Universities	0.00
4	Krishi Vignana Kendra	0.00
5	Raitha Samparka Kendra	0.00
6	Farmers/Friends	23.33
7	Input Suppliers	0.00
8	Agri Exhibitions	0.00
9	ZP/TP/GP	0.00
10	Others	0.00
Total		**123.33**

Note: Total % exceeds 100 (Hundred) due to multiple response by some of the farmers.

has been reflected in the Table that 100 per cent sample beneficiary got the NFSM information from State Agriculture Department while some of them also came to know about the Mission from co-farmers and friends.

4.2 Costs and Subsidy Particulars of Availed NFSM Benefits

Table 4.2 shows the particulars of benefits availed under NFSM scheme from 2007-08 up to 2013-14. It is seen that out of 300 sample beneficiary farmers, 50.00 per cent sample beneficiaries received certified seed (18.87 per-cent subsidy) and 50.00 beneficiaries got seed minikits of high yielding varieties/hybrid rice (50.00 per cent subsidy). All sample beneficiaries got incentive for micro nutrients and lime application in acid soils (50.00 per cent subsidy).Only 5.33 per cent beneficiaries received

Table 4.2
Particulars of benefit availed (2007-08 up to 2013-14)

Sl. No	Benefit Item Name	No. of HHs benefitted to aggregate beneficiaries	Avg. total cost (Rs. per HH benefited)	Subsidy as % of total cost
1	Production of seeds- Certified seed	50.00	401.21	18.87
2	Seed minikits of high yielding varieties/hybrid rice	50.00	900.00	50.00
3	Incentive for micro nutrients (in deficit soils)	100.00	382.00	50.00
4	Incentive for lime in acid soils	100.00	544.55	50.00
5	Machineries/Tools			
6	Cono weeder	5.33	700.00	50.00
7	Zero till seed drills			
8	Multi-crop planters			
9	Seed drills			
10	Rotavators			
11	Pump sets	34.33	19541.26	51.73
12	Power weeder			
13	Knap Sack Sprayers (Manual and Power Operated)	29.00	1180.00	50.00
14	Sprinkler			
15	Plant protection chemicals			
16	Integrated Nutrient Management			
17	Integrated Pest Management			
18	Training	100.00	NA	100.00
19	Others			
	Total	46.08	2350.59	50.62

cono weeder (50.00 per cent subsidy), 34.33 per cent beneficiaries received pump sets (51.73 per cent subsidy), 29.00 per cent beneficiaries received (manual and power operated)

knap sack sprayers (50.00 per cent subsidy of total cost) while all the beneficiaries got the benefits of training programme under NFSM -rice.

4.3 Annual Usage of Farm Equipments and their Benefits

Table 4.3 reflects the annual usage of farm equipments availed under NFSM rice. It has been observed from the Table that annually, every benefitted household used pump sets for 17.24 numbers of days covering 5.02 acres .Similarly, knap sack sprayers (manual and power operated) were used for 3.94 numbers of days per benefitted households while cono weeders were used for 4.45 numbers of days covering 0.91 acres area per benefitted households.

Table 4.3
Annual usage of farm equipments availed under NFSM (Per annum)

Sl.No	Name of the implement	No. of days used per benefited HH	Area covered per benefited HH (acres)	Imputed value own use (Rs/ benefitted HH)	Rented value (Rs/ benefitted HH)
1	Pump sets	17.24	5.02	8002.23	630.61
2	Knap Sack Sprayers(Manual and power operated)	3.94	2.48	1891.72	556.55
3	Cono Weeder	4.45	0.91	568.75	0.00
Total		10.63	3.63	4,844.22	550.35

*Use one manday = 8 hrs for estimating No. of days used per implement per annum

It was observed during the field survey that the NFSM beneficiaries derived different types of benefits by using various equipments provided by the Government. Table-4.4 indicates that by using Govt. supplied pump sets, 84.62 per cent beneficiary households could perform their agricultural activity on time, 98.06 per cent sample farmers could attain good plant growth and another 98.06 per cent sample farmers could to reduce the cost of cultivation which in turn helped them to increase the production and income level. The Table also reflects the benefits of using Knap Sack Sprayers by the NFSM beneficiaries. By using this input, 100 per cent households realised good plant growth leading to increase cropping intensity as compared to pre- NFSM programme. Another useful equipment, cono weeder was also found to be beneficial for the sample farmers. By using this input, all the sample farmers could control weed to a considerable extent and realised good plant growth. This, in turn, reduced the cost of cultivation and increased their profit.

Table 4.4
Benefits derived from farm equipments (% of benefitted HH)

Sl. No.	Benefit derived/Name of the implement	Pump Sets	Knap Sack Sprayers	Cono-Weeder
1	Solved labour shortage	0.00	0.00	0.00
2	Timely operations	84.62	0.00	0.00
3	Saved water	0.00	0.00	0.00
4	Weed control	0.00	0.00	100.00
5	Good plant growth	98.06	100.00	100.00
6	Reduced drudgery	0.00	0.00	0.00
7	Helped in transportation	0.00	0.00	0.00
8	Reduced cost of cultivation	98.06	00.00	100.00
9	Increased cropping intensity	0.00	100.00	0.00
10	Reduced post harvest losses	0.00	0.00	0.00

Note: Figures may not add up to 100 due to multiple responses

Thus, from the above analysis, it becomes clear that the sample beneficiaries derived multiple benefits by using the farm equipments supplied by the State Government under NFSM scheme.

Impact of the benefit availed under NFSM

In the course of the study, it was tried to assess the impact of benefits availed under NFSM scheme. The beneficiary respondents viewed that they had realised some positive results by using the inputs provided by the Government under the NFSM scheme. Table 4.5 shows the different types of benefits availed under NFSM scheme.

According to the Table, 100.00 per cent sample beneficiaries realised the improvement of soil after using micro nutrients, lime in acid soil supplied by the Government. It may be due to the fact that, quality of grain improved after using proper doses of micro nutrients and also the sample growers could easily perform their agricultural activities by using pump sets and sprayers *etc*. The Table also reflects that the crop productivity had increased by 10-15 per cent after using pump sets, 5-10 per cent after receiving seed minikit of high yielding

Table 4.5
Impact of the benefit availed under NFSM

Sl. No	Name of the implement → / Benefit derived ↓	Assam							
		Production of seeds-certified seed	Seed minikit high yielding varieties	Incentive for Micro Nutr-ients (in deficit soils)	Incentive for lime in acid soil	Cono weeder	Pump sets	Knap Sack Sprayers	Training
		(***Benefit Code 1***)	(***Benefit Code 2***)	(***Benefit Code 3***)	(***Benefit Code 4***)	(***Benefit Code 6***)	(***Benefit Code 11***)	(***Benefit Code 14***)	(***Benefit Code 19***)
1	% increase in productivity	2 (Less than 5%)	3 (5-10%)	3 (5-10%)	2 (Less than 5%)	2 (Less than 5%)	4 (10-15%)	3 (5-10%)	2 (Less than 5%)
2	% fall in material cost	1 (No change)	4 (10-15%)	2 (Less than 5%)	2 (Less than 5%)	1 (No change)	1 (No change)	2 (Less than 5%)	1 (No change)
3	% fall in water use	1 (No change)	1 (No change)	1 (No change)	1 (No change)	1 (No change)	1 (No change)	1 (No change)	1 (No change)
4	% fall in labour cost	1 (No change)	2 (Less than 5%)	1 (No change)	1 (No change)	1 (No change)	1 (No change)	1 (No change)	1 (No change)
5	% reduction in losses after intervention	1 (No change)	2 (Less than 5%)	1 (No change)	2 (Less than 5%)	1 (No change)	2 (Less than 5%)	3 (5-10%)	2 (Less than 5%)
6	% increase in price of the output because of better quality	2 (Less than 5%)	3 (5-10%)	1 (No change)	1 (No change)	1 (No change)	2 (Less than 5%)	1 (No change)	1 (No change)
7	Improvement in soil health (% of HHs who have mentioned "yes")	0.00	0.00	100.00	100.00	0.00	0.00	0.00	0.00
8	Improvement in human health (% of HHs who have mentioned "yes")	0.00	0.00	100.00	83.00	0.00	0.00	0.00	0.00

Note: Only the relevant Impact columns have been filled; only the modal value

varieties, micro nutrients and knap sack sprayers. Marginal increase in productivity (less than 5%) was also noticed by the sample farmers after using certified seed, lime in acid soil, cono weeder and training programme conducted by the State Agriculture Department. There was a fall of about 10-15 per cent against material cost after getting HYV seed minikit, 5-10 per cent after using micro nutrient, lime and knap sack sprayers but no change was reported for use of certified seed, cono weeder, pump sets and training programme. There was no report of fall in water use after availing the Government intervention. Likewise, there was no significant fall in labour cost, reduction of crop losses, and increase in price of output due to the use of inputs provided under the NFSM scheme. However, price of output was increased by 5-10 per cent may be because of better quality due to the use of certified seed.

From the above analysis, it becomes clear that there was some positive impact of Government intervention on crop production under NFSM scheme. It is expected that the comprehensive approach through NFSM will help to transform the entire gamut of agriculture in Assam in the next few years.

4.4 Per acre Cost and Return of Paddy in *Kharif* and *Rabi* /*Summer* 2012-13

It was tried to estimate the per acre cost and return of paddy cultivated by the NFSM beneficiary farmers and also for non-beneficiary sample farmers for better comparison during the reference year under study.

The analysis of cost of cultivation of crops grown by the sample farm households is one of the most important factors for determining the economic feasibility of cultivation of crops. In other words, various inputs used by the farmers in production of different crops is of great importance in agricultural farm business. Capital investment is yet another factor which determines the production costs and plays a crucial role in increasing production and productivity of crops.

In this section, based on primary data collected from the sample farmers, an attempt has been made to estimate the cost of cultivation of *kharif* paddy and summer paddy grown by the sample farmers by adopting cost accounting method. The items of cost covered both paid out cost and imputed costs. The items covered under paid out costs were hired human labour, expenses on material inputs such as seed, fertilizer,

pesticides, farm yard manure, bullock/machine labour and other miscellaneous expenses. The imputed costs included inputs like home produced organic manure, family labour *etc*. The imputed value of family labour was worked out on the basis of statutory wage rate in the study area.

The inputs used and costs incurred by the NFSM and non-NFSM sample farmers in *kharif* paddy cultivation are presented in Table - 4.6. Table shows that per acre input costs in various items against NFSM farmers was found at Rs.10,707.58 and for non-NFSM sample it was estimated at Rs. 9,835.65. The Table also reflects that for NFSM sample, maximum costs was incurred against tractor and power tiller followed by bullock labour and harvesting and threshing while for non-NFSM sample, highest expenditure was incurred on bullock labour followed by harvesting and threshing and family labour. The total cost per quintal of production was found at Rs.840.73 for NFSM sample and Rs. 877.05 for non-NFSM sample.

Table 4.6
Per acre cost and return of paddy in *Kharif* 2012-13

Particulars	Unit	NFSM		Non-NFSM	
		Quantity	Value (Rs.)	Quantity	Value (Rs.)
Hired labour	Mandays	10	917.11	10	845.70
Family Labour	Mandays	15	1424.11	13	1223.49
Bullocks	Pair/day	7	1804.50	12	2966.58
Tractor/Power Tiller	Hours	26	2199.03	14	1195.95
Seed	Kgs	15.13	401.00	15.15	403.67
FYM/Organic/ Bio-fertilizers	Tonnes	0.46	1054.37	0.33	766.81
Fertilizers	Kgs	43.04	369.59	21.09	199.98
Zinc	Kgs	3.00	109.94	2.84	104.13
Lime	Kgs	42.64	134.29	0.00	0.00
Pesticides	Kg/lit	0.03	46.31	0.03	40.70
Irrigation charges	Rs.		56.60		46.95
Harvesting & Threshing	Rs.		1676.17		1567.78
Bagging, Transportation & marketing cost	Rs.		514.56		473.89
Total cost	Rs.		10707.58		9835.65
Main product	Qtls.	12.74	16072.88	11.21	13981.67
By-product	Qtls.	1.27	636.80	1.12	560.73
Gross Income (Main product +By-product)	Rs.		16709.68		14542.40
Net Income (Gross income-total cost)	Rs.		6002.10		4706.75
Cost per quintal (Total cost/Main product)	Rs.		840.73		877.05

The Table also reflects that both gross income and net income from *kharif* paddy cultivation was higher in case of NFSM sample farmers as compared to non-NFSM sample farmers while per quintal cost of production was comparatively higher in non-NFSM area than that of NFSM area.

Table-4.7 shows the per acre cost and return of summer paddy for NFSM and non-NFSM sample farmers. According to the Table, family labour, tractor /power tiller and hired labour required highest capital investment for both NFSM and non-NFSM sample farmers. The gross income and net income were found to be higher in NFSM sample as compared to non-NFSM sample households. It may be due to the fact that the sample NFSM paddy growers received the benefits of various farm inputs and equipments at subsidized rate and got trainings on efficient use of farm inputs.

Table 4.7
Per acre cost and return of paddy in *Rabi*/Summer 2012-13

Particulars	Unit	NFSM		Non-NFSM	
		Quantity	Value (Rs.)	Quantity	Value (Rs.)
Hired labour	Mondays	11	1,612.30	11	1,565.59
Family Labour	Mondays	29	4,159.30	28	4,069.48
Bullocks	Pair/day	5	719.03	5	905.25
Tractor/Power Tiller	Hours	8	1,715.87	7	1,551.32
Seed	Kgs	15	900.00	16	559.35
FYM/Organic/ Bio-fertilizers	Tonnes	0.31	662.81	39	911.58
Fertilizers	Kgs	63	543.50	79	680.00
Zinc	Kgs	3	110.00	0	0.00
Lime	Kgs	140	770.00	0	0.00
Pesticides	Kg/lit	0	148.20	0	171.01
Irrigation charges	Rs.		759.27		639.92
Harvesting & Threshing	Rs.		573.73		637.29
Bagging, Transportation & marketing cost	Rs.		257.31		268.49
Total cost	Rs.		12,931.32		11,959.27
Main product	Qtls.	17.63	21,359.69	14.15	17,322.29
By-product	Qtls.	1.67	837.33	1.34	668.59
Gross Income (Main product.+By-product)	Rs.		22,197.02		17,990.88
Net Income (Gross income-total cost)	Rs.		9,265.70		6,031.61
Cost per quintal (Total cost/Main product)	Rs.		733.54		845.03

4.6 Marketed Surplus and Marketing Channels

An efficient marketing system is indispensable for the success of agricultural production programme. Marketing is an important link in the chain of production activities of agricultural sector. Organised marketing therefore, is a precondition to sustain any production programme, more particularly, agricultural production. Marketing of agricultural crops in Assam is largely unorganized and predominantly in the hands of intermediaries such as retail traders, wholesalers, the pre- harvest contractors and others.

During the study period, it was tried to find out the amount of marketed surplus produced by the NFSM beneficiary and non-beneficiary farmers. Efforts were also made to identify the marketing channels in the referred areas and are presented in the Table-4.8.

It is seen that, 71.33 per cent of the total NFSM sample farmers sold 75.49 per cent of the total marketed surplus in the local market and remaining 26.67 per cent sample farmers sold their surplus production to the village merchant. Similarly, 66.00 per cent of the total non-NFSM sample households marketed 72.64 per cent of the total marketed surplus in the local market and rest 23.00 per cent farmers sold their surplus grain to the village merchant.

Thus from the above analysis, it becomes evident that, in the study area, there was no any emerging marketing channel for agricultural produce like paddy and the sample farmers used the traditional and primitive system for selling their surplus production.

Table 4.8
Marketing channels and marketed surplus of Paddy

Sl. No.	Particulars of output sold	NFSM		Non-NFSM	
		% of HH to the total	% of the value marketed	% of HH to the total	% of the value marketed
1	Wholesale market				
2	Local market	71.33	75.49	66.00	72.64
3	Merchant	26.67	24.51	23.00	27.36
4	Co-operative				
5	Government				
6	Intermediaries				
7	Private company				
8	Mills				
9	Others				

4.7 Summary of the Chapter

This chapter is designed to assess the impact of various interventions on NFSM on farming, its impact on beneficiary farmers. It also tried to study the extant of awareness and sources of information as received by the farmers on NFSM scheme, particulars of benefit availed, per acre cost and return of paddy, amount of marketed surplus and marketing channels of paddy for better implementation of NFSM scheme.

The chapter reveals that all the beneficiary farmers were aware of the NFSM scheme. 100 per cent sample farmers received information about the scheme from the State Agriculture Department. Some of the sample farmers got information from co-farmers/relatives as well. It was reported that average total benefit received from various components of NFSM paddy was Rs.2, 350.59 per household. It was observed that the pump sets were used for 17.24 numbers of days (covering 5.02 acres per benefitted households), knap sack sprayers (manual and power operated) were used 3.94 numbers of days per benefitted households while cono weeder were used for 4.45 number of days covering an area of 0.91 acres per benefitted households.

It was observed during the field survey that the NFSM beneficiaries derived different types of benefits by using various equipments provided by the Government. By using Govt. supplied pump sets, 84.62 per cent beneficiary households could perform their agricultural activity on time, 98.06 per cent sample farmers could attain good plant growth and another 98.06 per cent could reduce their per acre cost of cultivation which in turn helped them to increase the production and income level.

It was tried to estimate the per acre cost and return of paddy cultivated by the NFSM beneficiary and non-beneficiary farmers for better comparison during the reference year under study. It was found that in *kharif* paddy cultivation, per acre input costs against NFSM farmers was worked out at Rs.10,707.58 and for non-NFSM sample farmers, it was estimated at Rs. 9,835.65. For NFSM sample, maximum costs was incurred against tractor and power tiller followed by bullock labour and harvesting and threshing while for non-NFSM sample, highest expenditure was incurred on bullock labour followed by harvesting and threshing and family labour. The total cost per quintal

of production was found at Rs.840.73 for NFSM sample and Rs. 877.05 for non-NFSM sample. In summer paddy cultivation, per acre cost was recorded at Rs.12931.32 for NFSM and Rs.11959.27 for non-NFSM sample farmers.

During the study period, it was tried to find out the amount of marketed surplus produced by the NFSM beneficiary and non-beneficiary farmers and the marketing channels, if any. It was found that, 71.33 per cent of the total NFSM sample farmers sold 75.49 per cent of the total marketed surplus in the local market and remaining 26.67 per cent sample farmers sold their surplus production to the village merchant. Similarly, 66.00 per cent of the total non-NFSM sample households marketed 72.64 per cent of the total marketed surplus in the local market and rest 23.00 per cent farmers sold their surplus grain to the village merchant.

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Chapter V

Participation Decision, Constraints and Suggestions for Improvement of NFSM

In this chapter an attempt has been made to analyse the participation decision, constraints and suggestions for the improvement of NFSM scheme**.**

5.1: Factors influencing participation of farmers in NFSM

In order to identify the factors influencing participation of farmers in NFSM, the logistic regression model was used by taking relevant independent variables as shown in Table-5.1.

Table 5.1

Factors influencing participation in NFSM

(Dependent variable: 1 for NFSM beneficiaries; otherwise : 0)

Independent variables	Coefficient(S.E)	P-Value
Age (Years)	-0.093 (0.045)	0.038 *
Education		
Till secondary	-22.372 (0.000127)	0.999
Higher secondary	-21.562 (0.000127)	0.999
Operational holdings (acres)	-0.698 (0.260)	0.007*
Family size	3.533 (0.586)	0.000*
Caste		
SC/ST	-0.720 (8.254)	0.931
OBC	0.665 (0.912)	0.466
Others	0.662 (0.908)	0.454
Income from farming	0.000(0.0000)	0.000 *
Ratio of irrigated to the total operational area	-2.317 (1.908)	0.225
Credit availed (per acre)	0.000	0.435
Farm asset value (Rs.)	0.000(0.000)	0.311
Constant	13.893 (.000127))	0.999
-2Likelihood ratio test statistic	**56.455**	
Cox & Snell R^2	**0.626**	
Nagelkerke R^2	**0.927**	

Note: * indicates significant at 5% probability level

From the Table-5.1, it is seen that the independent variables *viz.* age (years), operational holdings, family size and income from farming had significant effect on the farmers' participation in the NFSM programme. The other independent variables *viz.* education, caste, ratio of irrigated to the total operational area, credit availed (per acre) and farm asset value did not show any significant impact, may be because of some

exogenous factors which were not considered for the present analysis. Likelihood ratio test statistic stood at 56.455, Cox & Snell R^2 stood at 0.626 and Nagelkerke R^2 stood at 0.927 which indicate the efficiency of the data set on the final outcome.

5.2: Constraints faced in availing the NFSM benefits

People of Assam living in rural areas face many problems in their day to day life. The Central and State Government have taken various steps for upliftment of the economic conditions of the rural people through various programmes conducted at different point of time. But most of the rural people are not aware about these programmes.

The NFSM is a flagship programme of the Government of India and is being implemented by the respective state Governments. Here, an attempt has been made to analyse the constraints faced by the rural farmers and also the implementing agencies.

5.2.1 Financial constraints

So far as financial issues are concerned, there was no constraint either at state or district level. For each activity under NFSM, sufficient fund was made available as per target. However, non- release of fund on time at the district level was identified as a great problem by the sample households.

5.2.2 Administrative constraints

Major constraints in implementation of NFSM were of administrative nature, some of which are enumerated below.

5.2.2.1 Insufficient manpower

Insufficient manpower was reported to be one of the major constraints associated with NFSM and other agriculture based programmes. At state level, Joint Director, Agriculture is having additional responsibility of NFSM and at district level respective Deputy Director, Agriculture is additionally responsible for NFSM scheme. With the continued expansion of physical and financial outlay against various schemes, the Department itself is the facing problem of acute shortage of staff.

5.2.2.2 Complex procedure

To avail the benefit of any component of the scheme, a farmer has to pass through a set of complex procedure with lot of paper works, and many of the illiterate

farmers were not in a position to complete the existing procedure. As a result, only the informative and educated farmers could avail the benefits of the scheme.

5.2.2.3 Political interference

On many occasions, local leaders exerted pressure on the field staff to give benefits of minikits, pesticides and other components to them or to their peer group. It led to create problems for the Departmental staff with regard to adherence to the operational guidelines and dissatisfaction among other farmers towards the mission.

5.2.2.4 Lack of coordination

According to the of NFSM guidelines, apart from the Department of Agriculture, various other departments and agencies are involved in implementation of various components. But the other associated agencies considered that it was the responsibility of DoA only. Thus, lack of coordination between DoA and other agencies has led to failure of many of the planned activities with respect to timeliness and fulfilment of activity specific objectives.

5.2.2.5 Monitoring

Monitoring of field activities was found inadequate in the sense that it was not at par with the normative requirements. Proper monitoring of activities was not possible due to lack of regular field visits by the field functionaries or supervisory staff.

5.2.3 Technical constraints

5.2.3.1 Inefficiency of technical staff

Procedural layout for monitoring of NFSM at all three tiers *viz.* district, state and national was excellent and if adopted in letter and spint, no one need to ask for any report at any point of time for any area. But, the staffs who are implementing the Mission at district level and given the responsibility of uploading the relevant data on website were not well trained and well equipped for the job. Online data entry by the Technical Assistant was reported to be very tedious because of two reasons, first, they were not well trained for the job and second, they did not find time for it as they were already overloaded with routine work.

5.2.3.2 Demonstrations

In each selected village, very limited number of demonstrations (only 2 or 3) were taken up which did not generate adequate effect to allow percolation of proven

technology in the village. Because, if somehow, a demonstration fails for any reason the farmers have to wait for one more season/year for a similar demo again.

5.2.4 Farmers' Field School (F.F.S) related constraints

Farmer's interest

In addition to NFSM, there are a number of agriculture based schemes like RKVY, ISOPAM etc. which are in operation in the state for years. All these schemes have the provision of FFS. In villages, most of the farmers did not wish to attend these FFS due to several reasons like repetition of same lectures under different schemes, lack of innovativeness in lectures which can generate interest to target audience and also, non-availability of subject experts. Apart from it, target fixed per block for organizing FFS were not in accordance with the availability of scientists/technical experts. In most of FFS, agriculture supervisors who delivered the lectures were not at all competent as reported by the respondent farmers.

Table 5.2 depicts the constraints faced by the farmers in availing the NFSM benefits. It is seen from the Table that out of the total beneficiaries, only 50 per cent beneficiary responded in the affirmative on the issue of disseminating NFSM information to the sample households. 100 per cent beneficiary farmers reported that the eligibility

Table 5.2
Constraints faced in availing the NFSM benefits (only Beneficiary)

% of beneficiaries faced problem/s while availing the scheme			
Sl. No	Constraints	Yes (%)	Remarks
1	Information about NFSM reaches comprehensively to the households	50	
2	Eligibility or criteria for availing the subsidy is provided to the households	100	
3	Procedure for the subsidy quite easy (if no provide details in remarks)	100	
4	Only few documents are required for availing the subsidy (if no provide details in remarks)	100	
5	Subsidy paid after purchase while initial payment remains the biggest problem	50	
6	Institutional financing facility available under the programme	0	
7	Capacity building/technical advice is provided under the programme	100	
8	Long time gap between the purchase and receiving the subsidy amount	0	
9	Biased towards large land owners	0	
10	Poor quality of materials/machinery are supplied	0	
11	Others	NA	

criteria for availing the subsidy was provided to the households, the procedure for availing the subsidy was quite easy and only few documents were required for availing the subsidy and as such , these were not at all a problem for them. Again, of the total beneficiary 50 per cent responded that the subsidy was paid only after purchase, while initial payment remained the biggest problem .Getting training exposure or technical advice was also not considered as a constraint by the sample farmers. As pointed out by the respondents, there was no institutional financing facility available under the programme. Further, there was no long time gap between the purchase and the receipt of subsidy amount and the programme was not biased towards large land owners. They also reported that no poor qualities of materials/machinery were supplied to the farmers under the programme.

5.3: Suggestions for Improvement of the NFSM Scheme

For improvement of the NFSM scheme, some suggestions have been put forwarded based on the precise observations and findings of the present investigation.

Table 5.3
Suggestions for improvement of the NFSM scheme (only Beneficiary)

Sl. No.	Suggestions	% of the Beneficiaries farmers
1	Assured irrigation is a must for second crop (Summer Paddy)	24.42
2	Exhibition cum Training Programme is needed to make the farmers knowledgeable	12.00
3	Exposure visit to encourage the farmers	3.42
4	Extensive training is needed for IPM programme.	9.33
5	Selection should be unbiased	9.33
6	Soil testing is needed	3.83
7	Third party intervention should be stopped.	7.58
8	Time lag in implementation of the programme needed due attention.	10.75
9	Timely intervention and proper prescription for any kind of attack of pest & diseases on standing crops	4.08
10	Timely supply of inputs	15.25

Table-5.3 summarises the suggestions for improvement of the NFSM scheme as enumerated by the sample beneficiary.

Assured irrigation

For the development of agricultural sector, availability of irrigation facility is one of the most important factors especially for summer paddy. Of the total beneficiaries 24.42 per cent beneficiary suggested for assured irrigation.

Exhibition cum Training Programme is needed to make the farmers knowledgeable

Most of the farmers in rural areas are illiterate. They are not aware of the schemes launched and implemented by the Government Departments. So, focussed awareness campaign & comprehensive trainings are very necessary to make the farmers informative and proactive. Out of the total beneficiaries, 12 per cent beneficiaries suggested for launching of extensive training programme.

Exposure visit to encourage the farmers

Out of the total beneficiaries, only 3.42 per cent beneficiary farmers suggested for exposure visit. During survey work, it was emerged as an important issue in order to encourage the farmers. If undertaken in right perspective, the farmers would be able to know about the different level of adoption of modern agricultural technology in different places.

Training on IPM

Out of the total beneficiaries, 9.33 per cent beneficiary farmers suggested for extensive training on IPM programme. It is because of the fact that most of the farmers did not know how to protect their crops from pest infestation. So, it is necessary to train them up to meet the challenges.

Selection should be unbiased

It was observed that in some places, some of the needy farmers were deprived of various developmental schemes implemented by Government Departments. So, 9.33 per cent farmers suggested for unbiased selection of beneficiary households.

Soil testing

There are different types of soils in Assam. All types of soils are not suitable for all the crops. So, it is necessary to test the soil beforehand for better crop production. Of the total beneficiaries, 3.83 per cent beneficiaries suggested for soil testing for better crop productivity.

Third party intervention should be stopped

It was observed that in some cases, implementing authorities could not implement the schemes according to their choices and approved Guidelines. There was always third party intervention, political or otherwise. So, 7.58 per cent farmers suggested that third party intervention should be stopped to the extent possible.

Time lag in implementation of the programme need due attention

Generally, developmental schemes are launched in the country with a definite set of milestones. These milestones are to be met as per the schedule to reap the actual benefits. But, most often, it does not happen, and time lag in course of implementation becomes very common. Of the total beneficiaries, 10.75 per cent beneficiaries suggested for due attention towards time lag in course of implementation of the NFSM programme.

Timely intervention and proper prescription for any kind of attack of pests and diseases

Of the total beneficiaries, 4.08 per cent beneficiaries suggested for timely intervention and proper prescription for any kind of attack of pests and diseases on standing crops. Pests and diseases may cause devastating effect, if adequate care is not taken on time.

Timely supply of inputs

It was observed that, the agricultural inputs were not reached the farmers on time. So, it is necessary to arrange for timely supply of inputs for better crop production. Out of the total beneficiaries, 15.25 per cent beneficiaries insisted on timely supply of inputs.

During the course of investigation, the opinion of the non-beneficiary farmers was also recorded and they put forwarded some suggestions for improvement of the scheme which are indicated in Table 5.4 below.

Of the total non- beneficiaries sample households, 14.75 per cent farmers suggested for assured irrigation and 12 per cent suggested for extensive training on IPM programme. Nearly, 15.75 per cent farmers emphasised upon improved marketing facilities and 14.50 per cent recommended for proper use of fertilizers and

Table 5.4

Suggestions for improvement of the NFSM scheme (Non-Beneficiary)

Sl. No.	Suggestions	% of the Non-beneficiaries
1	Assured irrigation	14.75
2	Extensive training is needed for IPM programme.	12.00
3	Marketing needs attention	15.75
4	Proper doses of fertilizer and micronutrients be applied	14.50
5	Soil testing is needed	22.00
6	Timely supply of inputs	21.00

micronutrients. Further, 22.00 per cent of the non-beneficiary sample farmers underlined the importance of soil testing and 21.00 per cent farmers insisted on timely supply of inputs.

5.4: Reasons for Non-participation in the NFSM

Though NFSM was implemented since 2007 in 13 districts of Assam, some farmers did not participate in the programme. When interacted, they put forwarded some reasons for non-participation in the NFSM, which are presented in Table-5.5. Of the total non-beneficiary farmers, 4.00 per cent opined that due to biased selection of farmers they were excluded from the programme. Another 33.33 per cent expressed that due to lack of awareness, they could not participate in the programme. Some farmers (28.33 per cent) were not interested in any government scheme. 10.67 per cent farmers opined that due to their resource limitations, they were excluded from the programme. As many as 23.67 per cent sample non-beneficiary household informed that they were benefited under other programme like RKVY. That may be the reason why they were excluded from the NFSM programme.

Table 5.5

Reasons for non-participation in the NFSM (only non-beneficiary)

Sl. No.	**Reasons**	% of the Non-beneficiaries
1	Due to biased selection of farmers (in some place) they are excluded from the programme.	4.00
2	Lack of awareness about NFSM scheme	33.33
3	Not interested in any government Agril. scheme	28.33
4	On account of limited recourses non-beneficiaries are excluded from this programme.	10.67
5	Some non-beneficiaries are also covered by other programme under RKVY. That is why they were excluded from the programme.	23.67

Source : Field Survey data.

5.5 Suggestions for inclusion of Non-Beneficiary household for availing the benefits under NFSM

The non-beneficiary farmers, in their turn also put forwarded some suggestions for inclusion under NFSM scheme, which are presented in Table-5.6.

Of the total non-beneficiary farmers, 15.75 per cent opined that biased ness in selection of beneficiaries should be stopped in the general interest of the scheme. Due to multiple responses, this percentage (15.75) was higher than that of the reason shown in Table-5.5. They had further suggested that the inputs should be supplied free of cost (23.25 per cent). Nearly 1.75 per cent farmers desired that the benefits should reach the farmers' field on time.

Table 5.6
Suggestions for inclusion of non- beneficiary for availing benefits under NFSM (only non-beneficiary)

Sl. No.	Suggestions	% of the Non-beneficiaries
1	Biased in selection of beneficiaries should be stopped.	15.75
2	100% Free supply of inputs	23.25
3	Benefits should reach farmers' field timely	1.75
4	Fund allocation **(**NFSM Budget**)** should be increased.	9.25
5	Motivation of farmers is essential	25.00
6	Strengthening the agricultural extension services	25.00

Source : Field Survey data.

Fund allocation (NFSM budget) should be increased to rope in more farmers under the mission (9.25 per cent).

Out of the total non-beneficiary farmers, 25.00 per cent were of the view that motivation of farmers is a must to bring in changes in the field. In the rural area some farmers were not interested in adoption of new farm technology. They are still using traditional method of cultivation.

Strengthening of agricultural extension services was yet another major issue to be addressed as perceived by the non-beneficiary sample farmers (25.00 per cent). Frequent training programme and demonstration is required among the rural farmers. It is observed that training programme and demonstrations on new farm technology were very limited.

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Chapter VI

Concluding Remarks and Policy Suggestions

6.1 Background

The National Food Security Mission was launched in 2007-08 by the Ministry of Agriculture, Government of India, with the purpose of enhancing the production of rice, wheat and pulses by 10, 8 and 2 million tonnes respectively by the end of the Eleventh Plan (2011-12). The major objective of this scheme is to increase production and productivity of wheat, rice and pulses on a sustainable basis so as to ensure food security of the country.

The interventions under the NFSM to achieve the main objective of increasing production of rice, wheat and pulses have been so formulated that it amalgamates the proven technological components covering seeds of improved variety, soil ameliorants, plant nutrients, farm machines/implements and plant protection measures. The Mission initially covered a total of 312 districts of 17 states. Over the Plan period, a number of other Districts and States were included under the three crops envisaged in the scheme, *viz*. rice, wheat and pulses and since 2010-11, the Mission covers a total of 480 districts of 18 states which comprises of 142 districts of rice in 14 states, 142 districts of wheat in 9 states and 468 districts of pulses in 16 states. According to the requirements of different crops, component-wise separate interventions as well as budgets are advanced by the Mission.

NFSM comprised of three components during the XI Plan

(iv) National Food Security Mission – Rice (NFSM-Rice)

(v) National Food Security Mission – Wheat (NFSM-Wheat)

(vi) National Food Security Mission – Pulses (NFSM-Pulses)

The total financial implication for the NFSM was Rs. 4882.48 crores during the Plan period (2007-08 – 2011-12).

As per operational guidelines of National Food Security Mission during the 12th Five Year Plan, NFSM is covering five components (i) NFSM- Rice; (ii) NFSM-Wheat; (iii) NFSM-Pulses, (iv) NFSM- Coarse cereals and (v) NFSM-Commercial Crops.

The Mission is being continued in the 12th Five Year Plan as well, with new targets of additional production of 25 million tons of food grains comprising of 10 million

tons rice, 8 million tons of wheat, 4 million tons of pulses and 3 million tons of coarse cereals by the end of 12th Five Year Plan. Based on past experience and feedback received from the States, major changes have been made in approach, norms of financial assistance and programme implementation strategy which are reflected in the revised operational guidelines.

Accordingly, like other States in India, NFSM-rice was also launched in Assam in 2007-08 covering 13 districts of the state. The objectives of the scheme are- i) Increasing production of rice through increase in area and productivity ii) Restoring soil fertility and productivity at individual farm level iii) Enhancing farm level economy to restore confidence among the farmers and iv) Creation of employment opportunities.

Agriculture in Assam has been playing a very important role in state's economy. The percentage of area under different crops constituted 53.04 per cent of the total geographical area in the year 2010-11. Rice being the staple food of Assam, the area under paddy cultivation is high. The paddy cultivation during the year 2012-13 occupied 88.50 per cent of the net cropped area and 59.80 per cent of the gross cropped area in the state as against 90.60 per cent and 61.20 per cent of the net cropped area and the gross cropped area respectively, during the year 2011-12. The dominant crop, paddy is cultivated in three different season's *viz.* winter season (*Sali),* summer season (*Boro*) and autumn season (*Ahu*). As per final estimates, the average area covered under normal paddy cultivation during the year 2012-13 was 24.88 lakh hectares (about 92.40 per cent of the total area under food grains in the state). The area coverage under pulses in 2012-13 was 1.42 lakh hectares as against 1.26 lakh hectares in 2010-11.

In Assam, National Food Security Mission (NFSM) pulses was launched in 2010-11 targeting the districts where area under pulses is more but productivity is comparatively lower. The scheme covers 10 districts of the state. Accelerated pulses production programme, popularly known as A3p is a sub-scheme of NFSM (pulses).

The objectives of the scheme are –i) Increasing area coverage and productivity of pulses to increase production. ii) Popularising pulses cultivation through demonstration programmes. iii) Enhancing farm income of pulses cultivators through increase in productivity.

6.2 Main objectives and Scope of the study:

Keeping in view of the importance of the subject, the objectives of the present study has been framed as under-

1. To analyse the trends in area, production, productivity of rice and pulses in the NFSM and non NFSM districts in Assam;
2. To analyse the socio-economic profile of NFSM *vis-a-vis* Non-NFSM beneficiary farmers of rice;
3. To assess the impact of NFSM on input use, production and income among the beneficiary farmers of rice;
4. To identify factors influencing the adoption of major interventions (improved technologies) under NFSM and
5. To identify the constraints hindering the performance of the programme

The NFSM is extended to 12th Five Year Plan due to its success in achieving the targeted goal of production enhancement. It is essential to evaluate and measure the extent to which the programme and approach has stood up to the expectations. The study would enlighten the policy makers to incorporate necessary corrective measures to make the programme more effective and successful during the 12th Five Year Plan.

6.3 Data and Methodology

The study is undertaken in the state of Assam for rice. For the selection of beneficiary and non-beneficiary of NFSM (rice), a multi-stage sampling design was used. The study covers two districts *viz.* Nagaon and Tinsukia of the state according to highest and lowest production of rice among the NFSM districts as per methodology of the study. From each district, two blocks were selected, drawing one block from the nearby district headquarters and the second at a distance of 15-20 kilometre from the district headquarters. Subsequently, 75 beneficiaries and 25 non-beneficiaries were selected from each block totalling to a sample size of 200 households. Altogether, 400 households were selected for the study. For the selection of beneficiary households in each block, the beneficiary lists were collected from the District Agriculture Office. After obtaining the beneficiary list, the households were selected in such a way that all the major components were covered under the scheme. The non beneficiary households were selected in the peripheral areas in such a way that a similar cropping pattern and baseline characteristics are represented by the non beneficiary households as well. For meeting the

objectives, primary household data were considered. The primary data relating to general information about the sample farmers, socio-economic profiles, cropping pattern, details on various inputs used in paddy cultivation, irrigation details, yield returns, reasons for adoption/non-adoption of NFSM interventions, constraints faced for availing the benefits, suggestions for improvement, etc. were collected from the sample beneficiary and non beneficiary farmers using a questionnaire prepared by the Coordinating Centre, ISEC, Bangalore. The primary household data were collected mainly pertaining to the agricultural year 2013-14.

Most of the secondary data and required information, at the national and state levels, on cropped area, irrigated area, yields were collected from the various issues of Economic Survey and Statistical Handbook of Assam published by the Directorate of Economics and Statistics, Government of Assam. Financial progress, target and achievement of NFSM, category wise interventions, outlay and expenditure for the 11th five year plan in Assam etc. were collected from the State Nodal Officer, NFSM, Assam.

To find out the factors influencing the participation of farmers in NFSM, the logistic Linear Regression Model was applied by taking binary dependent variables 1 for NFSM beneficiary and 0 for non- beneficiary.

6.4 Findings from Secondary Data

Accordingly, based on secondary level data, an analysis was carried out for state and district level to see the changes in area, production & productivity during the project implementation period. Followings are the results of the investigation-

1. During 9th plan period average AGR in net irrigated area was estimated at -0.16 per cent while average AGR in 10th plan period was 6.00 per cent and in 11th plan period, average AGR in net irrigated area was found at 13.59 per cent. The average AGR in gross irrigated area was highest (4.30 per cent) during 11th plan period followed by 1.77 per cent during 9th plan period and 1.14 per cent during 10th plan period. The average AGR in net sown area was highest (0.42 per cent) during 11th plan period followed by -0.15 per cent during 10th plan period and -0.02 per cent during 9th plan period. The average AGR in percentage of net irrigated area to net sown area was also highest during 11th plan period (13.12 per cent) followed by 6.09 per cent during 10th plan period and -0.13 per cent

during 9th plan period. The Average AGR in irrigation intensity was highest (11.74 per cent) during 11th plan period followed by 7.99 per cent during 10th plan period and -0.42 per cent during 9th plan period.

2. Average AGR in cropping intensity was highest (1.90 per cent) during 11th plan period followed by 0.35 per cent during 9th plan period and -0.96 per cent during 10th plan period. Fertiliser consumption varied from 25.73 kg/ha of NSA to 55.14 kg/ha and the average AGR stood at 22.95 per cent during 9th plan period. During 10th plan period fertiliser consumption varied from 60. 26 kg/ha of NSA to 73.98 kg/ha and the average AGR was reported at 11.50 per cent. In the next plan, the fertiliser consumption was 81.48 kg/ha for the year 2007-08 and it was increased to98.58 kg/ha in the year 2011-12. The average AGR stood at 6.01 per cent of NSA for the entire plan period. After launching of the NFSM in 2007, irrigation intensity, cropping intensity and fertiliser consumption in Assam had increased. So, it may be concluded that impact of NFSM on food grains production was positive.
3. Average AGR of paddy area was 0.16 per cent during 9th plan period, -2.82 per cent in 10th plan period and 2.90 per cent in 11th plan period. It is seen that average AGR was increasing after launching of NFSM in 2007. Likewise, production of paddy was also increased during 11th plan period and average AGR stood at 10.37 per cent. In case of productivity, it showed an increasing trend. The average AGR of productivity during 9th plan period was 2.32 per cent followed by -2.45 per cent during 10th plan period and 7.10 per cent in 11th plan period. It is evident from the Table that NFSM has positive impact on food grains production.
4. The AGR of NFSM pulses area was 12.70 per cent in 2011-12 and 2.87 per cent in 2012-13. The AGR of production was higher (11.78 per cent) in 2011-12 and 8.13 per cent in 2012-13. In 2011-12, productivity showed a negative AGR (-0. 88 per cent) and it was 5.17 per cent in 2012-13. The AGR of Non-NFSM pulses showed negative AGR in area, production and productivity in 2011-12. The AGR of Non-NFSM pulses in respect of area, production and yield during 2012-13 were 13.49 per cent, 28.01 per cent and 12.76 per cent respectively.

5. After launching of NFSM paddy (in 2007-08) and NFSM-pulses (in 2010-11), the area, production and yield of paddy and pulses started increasing in the state. In case of growth of paddy and pulses, it was seen that the AGR of production and productivity of Non-NFSM paddy and Non-NFSM pulses were in higher side. It may be due to the delay in input supply especially, seed in NFSM areas and implementation of other developmental in Non NFSM districts. Besides a biotic factor can also be equally responsible for the difference.
6. The targeted amount under NFSM-Rice was Rs.5914.84 lakh in 2010-11 which was the highest amount targeted during 11th plan period and achievement percentage was 99.61. The average AGR on amount targeted was Rs.3414.28 lakh during the 11th plan period and achievement was Rs. 3175.40 lakh and the achievement percentage stood at 93.00. In 2012-13 the targeted amount was Rs.8373.73 lakh and achievement was Rs. 2666.33 lakh and the percentage of achievement was 31.84. In 2013-14, amount released, amount targeted and achievement were Rs.5449.55 lakh, Rs.17517.03 lakh and Rs. 5314.55 lakh respectively and the percentage of achievement was 30.34. During 11th plan period, the average AGR on amount released amount targeted and achievement were Rs. 950.23 lakh, Rs. 889.46 lakh and Rs. 950.23 lakh respectively and the percentage of achievement stood at 106.83 . In 2012-13, the amount released, amount targeted and achievement were Rs.420.53 lakh, Rs.1385.20 lakh and Rs. 420.53 lakh respectively and the percentage of achievement stood at 30.36. In 2013-14, the amount released, amount targeted and achievement were Rs.4061.04 lakh, Rs.7226.808 lakh and Rs. 3942.76 lakh respectively and the percentage of achievement stood at 54.56.
7. The average AGR of amount released, amount targeted and achievement for total NFSM (Rice & Pulse) were Rs. 4125.63 lakh, Rs.4303.74 lakh and Rs. 3555.49 lakh respectively and the percentage of achievement stood at 82.61.
8. The district wise outlay and expenditure on NFSM-rice during 11th five year plan period in the state reveals that out of 13 NFSM-rice districts, allocation was highest (128.49 lakh) in Nagaon district and lowest (12. 90 lakh) in Tinsukia district. The total outlay and expenditure was 909.95 lakh in 2007-08. In 2008-

09, also the outlay was highest (131.65 lakh) in Nagaon district and lowest (69.035 lakh) in Tinsukia district. Total outlay and expenditure was 1223.09 lakh in 2008-09. In 2009-10, outlay was highest (78.38 lakh) in Darrang district and lowest (35.64 lakh) in Tinsukia district and the total outlay and expenditure was 773.12 lakh. Again in 2010-11 and 2011-12, the district of Nagaon recorded the highest outlay (105.585 lakh and 50.29 lakh respectively.) Expenditure was also 100 per cent in respective years. As a whole during 11th plan period outlay and expenditure was 100 per cent.

9. The district wise outlay and expenditure on NFSM-Pulses during 11th five year plan period in the state indicates that out of 10 NFSM-Pulses districts, allocation was highest (17.166 lakh) in Dhubri district and lowest (9.764 lakh) in Bongaigaon district in the year of launching. The total outlay and expenditure was 141.578 lakh in the year. In 2011-12, Outlay was highest (21.374 lakh) in Barpeta district and lowest (11.98 lakh) in Bongaigaon district. Total outlay and expenditure was recorded at150.24 lakh in 2011-12.

6.5 Findings from Field Survey Data

Further analysis of primary level data garnered from the study area yielded the following major findings.

a) The total number of household surveyed was 400, of which 300 were beneficiary households and 100 non-beneficiary households. The average family size was found at 6 person per household for both beneficiary and non-beneficiary sample households. The average number of household members engaged in farming was found at 43.58 per cent and 41.78 per cent respectively in NFSM and non-NFSM farm families. The percentage of male respondents was found to be 99.67 per cent and 100 per cent in NFSM and non-NFSM sample households, respectively. The percentage of adult male above 15 years of age was 38.14 per cent in NFSM and 38.11 per cent in non-NFSM farm families. The percentage of adult female above 15 years of age was 32.33 per cent and 30.07 per cent in NFSM and non-NFSM, respectively. Again, the percentage of population below 15 years of age was 29.53 per cent and 31.82 per cent in NFSM and non-NFSM, respectively.

b) Of the total family members, 11.33 per cent were illiterate, 23 per cent had education up to primary level, 38 per cent had education up to middle standard, 19 per cent read up to matriculation, 7 per cent passed higher-secondary and only 1.67 per cent are graduate .There were no post graduate degree holders in the sample households.

c) Of the total households, only 0.67 per cent was SC population, 1.33 per cent ST population, 47.67 per cent OBC population and 50.33 per cent belonged to general category population in NFSM households. On the other hand, of the total households only 2.00 per cent were ST population, 50.00 per cent OBC and 48 per cent general population in non-NFSM households. There was no SC population in non-NFSM households.

d) The total annual income per household from agriculture was found at Rs 84,986, Rs 4,959 from business, Rs 12,444 from salaried job, Rs.2, 717 from wage earners and Rs 8,177 from other sources like fruits, vegetables, jute & Mesta, plantation crops and tea. The average annual income from all sources stood at Rs 1, 13,283 in NFSM households. In case of non-NFSM households income from agriculture was found at Rs 51,701, Rs 2,591 from business, Rs 9,198 from salaried job, Rs 3,315 from wage earners and Rs 4,796 from other sources. The average annual income from all sources stood at Rs 71,601.

e) The total owned land was 1,035.60 acres in NFSM and 288.70 acres in non-NFSM households and per household holding stood at 3.45 acres and 2.89 acres in NFSM and non-NFSM farms, respectively. Per household net operated area stood at 3.90 acres and cropping intensity stood at 139 per cent irrigation intensity 177 per cent in NFSM farms. In non-NFSM households, per household net operated area were recorded at 3.11 acres, cropping intensity was found at 132 per cent and irrigation intensity stood at 194 per cent.

f) Three major systems of irrigation, viz. canal irrigation, well irrigation and tank irrigation are generally adopted in Assam. However, of the total irrigated area, only 0.99 acre (0.08 per cent) was under canal irrigation, 512.47 acres (43.85 per cent) under tube well irrigation and 655.10 acres (56.06 per cent) were rainfed amongst the NFSM farms in the study area. Only tube well irrigation system was

seen in the non-NFSM sample area. Of the total area, 91.9 acres (29.52 per cent) were irrigated and 219.39 acres (70.48 per cent) were rain fed.

g) There were two types of leasing-in and leasing-out terms e.g. share cropping and fixed rent in cash. Amongst the NFSM sample farms, there were 13.25 per cent share cropping area and 83.77 per cent fixed rent area in leased-in land and 14.87 per cent share cropping and 85.13 per cent fixed rent area in leased-out land. In non- NFSM sample farms, there were 14.06 per cent share cropping area and 85.94 per cent fixed rent area in leased-in land and 80.00 per cent share cropping and 20.00 per cent fixed rent area in leased-out land.

h) Of the total gross cropped area (1,622.23 acres), cereal crop (paddy) covered 66.75 per cent under NFSM farms and in non-NFSM households; paddy covered 77.90 per cent of the total gross cropped area of 411.54 acres.

i) Among the NFSM farm households, the value of output (main and by product) per household was Rs 1,39,047 and per acre value of output was Rs 35,697. Per household cost of production was Rs 54,061 and per acre cost of production was Rs 13,879, net return per household (farm business income) was Rs 84,986 and per acre net return was Rs 21,818. Non-farm income per household stood at Rs 28,298 and per acre non farm income stood at Rs 7,265. Total per household income from all sources stood at Rs 1, 13,283 and per acre total income stood at Rs 29,082. In non-NFSM farms, the value of output (main and by product) per household was Rs 91,903 and per acre value of output was Rs 29,526. Per household cost of production was Rs 40,202 and per acre cost of production was Rs 12,916, net return per household (farm business income) was Rs 51,701 and per acre net return was Rs 16,610. Non-farm income per household stood at Rs 19,901 and per acre non farm income stood at Rs 6394. Total per household income from all sources stood at Rs 71,601 and per acre total income stood at Rs 23,004.

j) Of the total households, 16.33 per cent household availed credit from Commercial Banks and the amount of outstanding loan per household was Rs 36,208.16 in NFSM households. In non-NFSM sample farms, only 9.00 per cent household availed credit from Commercial Banks and the amount of outstanding

loan per household was Rs 13,888.89. There was also informal credit availed by the sample farmers. In case of NFSM 0.33 per cent household availed informal credit and outstanding amount was Rs 5,000 per household. All the sample households took credit for productive uses only. Agricultural credit stood at Rs 31,129.17 per household and other credit stood at Rs 2,80,000.00 per household and the overall credit per household stood at Rs 36,208.16. In non-NFSM households, there was only agricultural credit which stood at Rs 13, 888.89 per household.

k) Of the total households, 16.33 per cent household availed credit from Commercial Banks and the amount of outstanding loan per household was Rs 36,208.16 in case of NFSM farms. In non-NFSM sample farms, only 9.00 per cent household availed credit from Commercial Banks and the amount of outstanding loan per household was Rs 13,888.89. There was also informal credit availed by the sample farmers. In case of NFSM farms, 0.33 per cent household availed informal credit and the outstanding amount was Rs 5,000 per household. All the sample households took credit for productive purposes only. Agricultural credit stood at Rs 31,129.17 per household and other credit stood at Rs 1,42,500.00 per household and the overall credit per household stood at Rs 35,584.00. In non-NFSM households, there was only agricultural credit which stood at Rs 13, 888.89 per household.

l) All the beneficiary farmers had a reasonable level of knowledge about the NFSM scheme. 100 per cent sample farmers received information about the scheme from the State Agriculture Department. The total benefit received from various components of NFSM paddy was Rs.2, 350.59 per household. It was further, observed that the pump sets were used for 17.24 numbers of days (covering 5.02 acres per benefited household), knap sack sprayers (manual and power operated) were used for 3.94 numbers of days per benefited household (covering 2.48 acres per benefited household), while cono weeder were used for 4.45 number of days covering an area of 0.91 acres per benefited household.

m) It was found that in *kharif* paddy cultivation, per acre input costs against NFSM farmers was worked out at Rs.10,707.58 and for non-NFSM sample farmers, it

was estimated at Rs. 9,835.65**.** For NFSM sample, maximum costs was incurred against tractor and power tiller followed by bullock labour and harvesting and threshing while for non-NFSM sample, highest expenditure was incurred on bullock labour followed by harvesting and threshing and family labour. The total cost per quintal of paddy was found at Rs.840.73 for NFSM sample and Rs. 877.05 for non-NFSM sample farmers. In summer paddy cultivation, per acre cost was recorded at Rs.12931.32 for NFSM and Rs.11959.27 for non-NFSM sample farmers.

n) During the study, it was tried to find out the amount of marketed surplus produced by the NFSM beneficiary and non-beneficiary farmers and the marketing channels, if any. It was found that, 71.33 per cent of the total NFSM sample farmers sold 75.49 per cent of the total marketed surplus in the local market and another 26.67 per cent sample farmers sold their surplus production to the village merchant. Similarly, 66.00 per cent of the total non-NFSM sample households marketed 72.64 per cent of the total marketed surplus in the local market and another 23.00 per cent farmers sold their surplus grain to the village merchant.

o) Logistic regression model was used by taking relevant independent variables to identify the factors influencing participation of farmers in NFSM. It is seen that the independent variables *viz.* age (years), operational holdings, family size and income from farming had significant effect on the farmers' participation in the NFSM programme. The other independent variables *viz*. education, caste, ratio of irrigated to the total operational area, credit availed (per acre) and farm asset value did not show any significant impact, may be because of some exogenous factors which were not considered for the present analysis. Likelihood ratio test statistic stood at 56.455, Cox & Snell R^2 stood at 0.626 and Nagelkerke R^2 stood at 0.927 which indicate the efficiency of the data set on the final outcome.

p) Out of the total beneficiaries, only 50 per cent beneficiary households responded in the affirmative on the issue of disseminating NFSM information to the sample households. 100 per cent beneficiary farmers reported that the information on eligibility criteria for availing the subsidy was provided to the households; also, the

procedure for availing the subsidy was quite easy and only few documents were required for availing the subsidy and as such , these were not at all a problem for them. Again, of the total beneficiary farmers, 50 per cent responded that the subsidy was paid to them only after purchase, while initial payment remained the biggest problem .Getting training exposure or technical advice was also not considered as a constraint by the sample farmers. As pointed out by the respondents, there was no institutional financing facility available under the programme. Further, there was no long time gap between the purchase and the receipt of subsidy amount and the programme was not biased towards large land owners. They also reported that no poor quality of materials/machinery was supplied to the farmers under the programme.

q) For improvement of the NFSM scheme, some suggestions have been put forwarded based on the precise observations and findings of the present investigation. Of the total beneficiaries, 24.42 per cent beneficiary farmers suggested for assured irrigation and 12 per cent beneficiaries suggested for launching of extensive training programme. Only 3.42 per cent beneficiary farmers pointed out for exposure visit and 9.33 per cent beneficiary farmers suggested for extensive training on IPM programme. Another 9.33 per cent farmers emphasized on unbiased selection of beneficiary households, 3.83 per cent beneficiaries suggested for soil testing for better crop productivity, 7.58 per cent farmers opined that third party intervention should be stopped to the extent possible. Nearly10.75 per cent beneficiaries drew attention towards time lag in course of implementation of the NFSM programme, 4.08 per cent beneficiaries suggested for timely intervention and proper prescription for any kind of attack of pests and diseases on standing crops and 15.25 per cent beneficiaries insisted on timely supply of inputs.

r) During the course of investigation, the opinion of the non-beneficiary farmers was also recorded and they put forwarded some suggestions for improvement of the scheme. Of the total non- beneficiaries sample households, 14.75 per cent farmers suggested for assured irrigation and 12 per cent suggested for extensive training on IPM programme. Nearly, 15.75 per cent farmers emphasised upon improved marketing facilities and 14.50 per cent recommended for proper use of fertilizers

and micronutrients. Further, 22.00 per cent of the non-beneficiary sample farmers underlined the importance of soil testing and 21.00 per cent farmers insisted on timely supply of inputs.

s) Though NFSM- rice was implemented since 2007 in 13 districts of Assam, some farmers did not participate in the programme. When interacted, they put forwarded some reasons for non-participation in the NFSM. Of the total non-beneficiary farmers, 4.00 per cent opined that due to biased selection of farmers they remained excluded from the benefits of the programme. Another 33.33 per cent sample farmers expressed that due to lack of awareness, they could not participate in the programme. Some farmers (28.33 per cent) were not interested in any Government scheme. About 10.67 per cent farmers opined that they were excluded from the programme due to their resource limitation. As many as 23.67 per cent sample non-beneficiary households informed that they were benefited under other development programme like Rastriya Krishi Vikas Yojana (RKVY).

t) The non-beneficiary farmers, in their turn also put forwarded some suggestions for inclusion under NFSM scheme. Of the total non-beneficiary farmers, 15.75 per cent opined that biased ness in selection of beneficiaries should be stopped in the general interest of the scheme and inputs should be supplied free of cost (23.25 per cent). Nearly 1.75 per cent farmers desired that the benefits should reach the farmers' field on time, fund allocation (NFSM budget) should be increased to rope in more farmers under the mission (9.25 per cent). Out of the total non-beneficiary farmers, 25.00 per cent were of the view that motivation of farmers is a must to bring in changes in the field. In the rural area some farmers were not interested in adoption of new farm technology. They are still using traditional method of cultivation. Strengthening of agricultural extension services was yet another major issue to be addressed as perceived by the non-beneficiary sample farmers (25.00 per cent). Frequent training programme and demonstration is required among the rural farmers. It is observed that training programme and demonstrations on new farm technology were very limited.

6.6 Policy Suggestions

Based on the findings of the study, the following suggestions are given for

policy implications.

1) There are possibilities of expansion of area under *rabi/summer* rice in the flood prone areas of the State during off-monsoon period if irrigation facilities are created in the potential areas. Introduction of HYV and hybrid seeds for *Boro* rice in these areas can definitely enhance the productivity.
2) More number of demonstration plots of NFSM rice are needed for the farmers to acquaint with the new technology.
3) Timely supply of seeds to avoid delay in sowing and thus loss in production should be ensured. For smooth service delivery, the entire responsibility should be entrusted to a separate wing of the State Agriculture Department to remove all the barriers in the distribution system
4) May be because of resource limitations, a large majority of farmers remained untouched under the NFSM programme and as a result, some amount of biasedness in selection of the farmers may creep in. Due care should therefore be taken to drive away any kind of dissatisfaction from among the non- participating farmers.
5) Keeping in view the utility of the farm implements in enhancing the production and productivity of rice, more efforts are required on the part of the implementing agencies to propagate their utility to the farming community to popularize the same
6) Ensuring timely availability of fertilizer and other nutrients is a critical component for enhancing productivity and as such, need more attention. A workable plan involving the manufacturers and suppliers is needed to ensure the supply of required inputs well ahead of time.
7) A balanced use of plant nutrients with respect to different agro-climatic regions of the State is a must for enhancing the crop productivity without any negative impact on the soil structure. In addition to chemical fertilizer the farmers may go for organic manure, biological nitrogen fixation and Integrated Nutrient Management from ecological point of view.
8) Transfer of hybrid rice technology from the research stations to the farmers' field is as important development of the new agricultural technology. Extension

agencies have to play a greater role in creating much needed awareness among farmers about the advantages of cultivating hybrid rice. In this regard, the State extension services need complete revamping. A new extension framework, which will cope with the new challenges and provide customized solutions to the farming community, is required to be put in place.

9) The frontline demonstrations, field days at strategic locations and FFS interventions of the Mission may be used more liberally for creating awareness about the advantages of taking up hybrid rice cultivation. Appropriate training programmes for farmers, farm women seed growers, seed production personals in the public and private seed agencies and extension functionaries of the State Department of Agriculture, should be well thought of to impart knowledge and necessary skills for hybrid rice cultivation.
10) Farmers should have easy access to credit at an affordable rate of interest, whenever necessary and.
11) The entire marketing system is required to be revamped so that each and every farmer can be an active player in the market for getting remunerative price for their produces.

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ANNEXURE

Coordinator's Comments on the Draft Report

The comments received on draft report from the Agricultural Development and Rural Transformation Centre, Institute for Social and Economic Change, Bangalore, Karnataka

Title of the draft report examined

Impact of National Food Security Mission (NFSM) on Input use, Production, Productivity and Income in Assam

1. **Date of receipt of the Draft report**: 4th June 2015
2. **Date of dispatch of the comments**: 26th June 2015
3. **Comments on the Objectives of the study**

   The objectives of the study have been fully addressed with additional information.

4. **Comments on the methodology**

   The common methodology proposed for collection of primary data and tabulation of results has been followed.

5. **Comments on analysis, organization, presentation etc.**

General remarks

- **Chapter I:** In this chapter, you may also include information for Assam state for the tables from 1.2 to 1.3.

  Action: Table-1.2 remains same because the interventions are almost same for Assam which was also incorporated in Chapter II. A line has been added in the text, accordingly. Done as per suggestion in case of Table- 1.3.

- **Chapter II:** The table formats and chapter outline is not followed (table formats attached). For instance: Table 2.1 was supposed to be on Trend in Area and Fertilizer use. Avoid repetition of tables. Please adhere to structure and table formats as per the guidelines given by us as it facilitates easy consolidation of state reports. The outline of chapter and table plan is enclosed.

  Action: It has been rearranged as per suggestion.

- Please include the table 2.1 on Trend in Area and Fertilizer Use in Assam

  Action: Done as per suggestion.

- Table 2.1 to Table 2.7: Please re-check the estimated AAGR values. The AAGR (average of year to year change) is estimated by using the formula: (current year-previous year)/previous year*100. Please consider the data of last year of previous plan

for estimation of year to year change for the first year of the plan for which the AAGR is estimated. For instance (hypothetical example), AAGR is estimated for NIA data of 10th plan is estimated as follows:

	Years	Net Irrigated Area in '000' ha	AGR
Value pertains to previous plan period	2001-02	6640	
	2002-03	6287	-5.31627
	2003-04	6753	7.41212
	2004-05	6794	0.607138
	2005-06	6729	-0.95673
10th Plan	2006-07	6893	2.437212
Average Annual Growth Rate(AAGR)			0.836696

Action: Re-checked as per suggestion.

- **Chapters III, IV and V:** (a) Decimals may be omitted while providing values in rupees; (b) In some tables absolute numbers are given. Instead of that, per cent to total sample would be better as followed by other states; (c) Wherever significant results are presented in these three chapters, discuss results with field experience gained during data collection and with existing literature relevant to results.

  Action: Done as per suggestion.

- Table 3.6a, per acre values are incorrect, as given the average area per household, per acre value should be per household value divided by per household area which does not match the correct values are given below, please make the corrections, see table below values in yellow highlighted:

Costs and returns particulars	**NFSM**		**Non-NFSM**	
	Rs. per household	Rs. per acre	Rs. per household	Rs. per acre
Value of output (main + by-product)	139,047	35697	91,903	29524
Cost of production	54,061	13879	40,202	12915
Net returns (Farm business income)	84,986	21818	51,701	16609
Non-farm income	28,298	7265	19,901	6393
Total income	113,283	29083	71,601	23002

Action: Corrected as per suggestion.

- Re-do the logistic regression by constructing dummies for education and caste. Use relevant variables for logistic regression analysis (not necessarily the variable given in the table templates sent by us)

  Action: Re -done as per suggestion.

- More discussion on summaries, conclusions and policy suggestions on each chapter would benefit in drafting consolidated report.

  Action: Done as per suggestion.

- There is ample scope for correction of errors, improvement of the grammar and language. Hence proofread the report carefully before submitting to us and to ministry.

  Action: Done as per suggestion.

  Specific remarks

- The specific comments / suggestions are provided in the draft report (word file) sent by you (attached). The file sent as a commented file. You may send a separate file after incorporating all comments.

  Action: Done as per suggestion.

6. Overall view on acceptability of report

The draft report can be accepted for consolidation and further submission to the ministry after it's been revised in accordance with the comments/suggestions. The soft copy of the revised report and excel data can be sent to us at the earliest as it helps in consolidating the state reports.

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