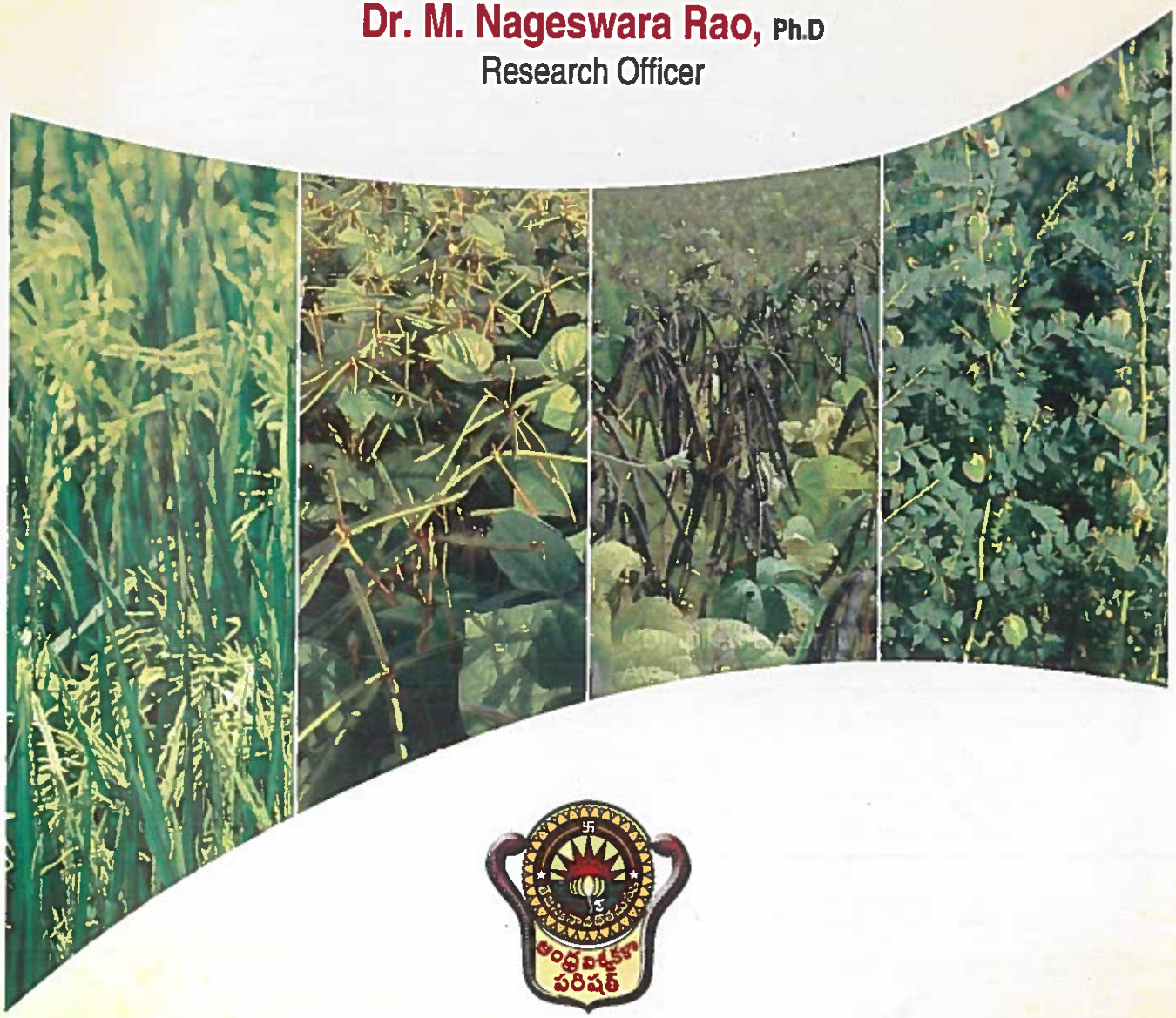
Agro-Economic Research Centre, Andhra University, Research Study Report No. 144

IMPACT OF NATIONAL FOOD SECURITY MISSION (NFSM) ON INPUT USE, PRODUCTION, YIELD AND INCOME IN ANDHRA PRADESH

Dr. M. Nageswara Rao, Ph.D
Research Officer



Study Sponsored by Ministry of Agriculture,
Co-operation and Farmers Welfare. Government of India
Agro-Economic Research Centre
Andhra University, Visakhapatnam
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PREFACE

The present study entitled "Impact of National Food Security Mission (NFSM) on Input use, Production, Productivity and Income in Andhra Pradesh" was undertaken at the instance of the Ministry of Agriculture, Government of India, Krishi Bhavan, New Delhi. The study has been coordinated by the Agricultural Development and Rural Transformation Centre (ADRTC) institute of Social and Economic Change (ISEC), Bangalore, Karnataka.

The NFSM scheme was launched in 2007-08 by the Ministry of Agriculture, Government of India for five years to increase production and productivity of rice, wheat and pulses on a sustainable basis, so as to ensure food security in India. NFSM scheme was launched in Andhra Pradesh covering 11 districts under rice crop (2007) and the key objective was increasing production of rice through increase in area and yield.

The study has considered both secondary and primary data in Andhra Pradesh state (united). The primary data collected from 300 NFSM beneficiaries and 100 non-beneficiary respondents of Nellore and Vizianagaram districts. The study found that the NFSM scheme by extending input subsidy and supplying farm technological implements to the beneficiary farmers helped them in enhancing farm productivity and in reaping more profits besides it stored confidence in respondents. The household survey was conducted in the agriculture year 2013-14.

The report analyses the impact of NFSM on input use production, productivity and income under rice crop in the state. On the basis of findings, relevant policy implications have been made. I hope this report will be useful for those who are interested to consider to make policy formulations (NFSM scheme) in Andhra Pradesh. I thankful to Dr. M. Nageswara Rao and his research team for putting in a lot of effort to complete the report.

We are grateful to the Commissioner of Agriculture and the officials of Directorate of Agriculture, Government of Andhra Pradesh, Hyderabad. I am also thankful to Joint Director of Agriculture and staff members of selected districts of Nellore and Vizianagaram. The field staff has helped us for the selection of sample villages and beneficiaries and also extended cooperation to conduct the field survey.

. I am grateful to Dr. M. Nageswars Rao, Research Officer who prepared the draft report of study, I am also thankful to Dr. K. Rambabu, Senior Research Investigator assisted in drafting of the report. I wish to express my thanks to members of the project team namely Dr. K.V. Giri Babu, Senior Research Investigator and Sri B. Krishna, Research Fellow for collection of data, data entry and tabulation and Smt. P. Malathi, Senior Assistant for neat word processing.

Prof. T. KOTESWARA RAO
HONORARY DIRECTOR

PROJECT TEAM

Project Leader	**:**	**Prof. T. Koteswara Rao**
Drafting of the Report	**:**	**Dr. M. Nageswara Rao**
Data Processing and Statistical Analysis	**:**	**Dr. K.V. Giri Babu** **Sri B. Krishna**
Computerization	**:**	**Smt. P. Malathi**

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IMPACT OF NATIONAL FOOD SECURITY MISSION (NFSM) ON INPUT USE, PRODUCTION, YIELD AND INCOME IN ANDHRA PRADESH

Introduction:

Andhra Pradesh is a leading state in food grain production. Rice is the principal crop extensively cultivated in all districts of the state (both Kharif and Rabi). The government of Andhra Pradesh ensured food security by initiating steps to accelerate agricultural growth. It was focussed on increasing cultivable area, production and productivity of food grains. The productivity of food grains went up from 3,011 kg per hectare to 3,323 kg per hectare. So the food grain production went up from 137.28 lakh tonnes to 190.74 lakh tonnes during the period 2003-04 to 2007-08. National Food Security Mission (NFSM) was launched in Andhra Pradesh in 2007-08 covering 11 districts under rice crop and the objective of the scheme was to increase the production of rice through increase in area and productivity. The area under rice crop covered 11 districts under NFSM scheme and it increased from 2105.47 thousand hectares to 2475.09 thousand hectares between 2007-08 to 2010-11. Further the rice crop area has slightly declined to 2079.69 thousand hectares in 2011-12 to 1798.29 hectares in 2012-13. Apart from rice crop the NFSM scheme implemented under pulse crops covered 14 districts in the state during the year 2007-08 and 2008-09. Further the scheme was extended to total 22 districts in the state.

Objectives of the Study:

1. To analyse the trends in area, production, productivity of rice in NFSM districts in Andhra Pradesh.
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.
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.

Methodology:

The study covered two NFSM districts viz. Nellore and Vizianagaram of Andhra Pradesh state. Nellore is the highest and Vizianagaram is the lowest rice producing districts selected for study in the state. From each district two mandals were selected and one mandal was selected from nearby district headquarters and the other was selected at distance of 15 to 20 kilometres from the district headquarters. 75 beneficiaries (NFSM-Rice) and 25 non-beneficiaries were selected purposefully from

each mandal totalling to a sample size of 200 households in each NFSM district. Altogether 400 households were selected for the study (300 beneficiaries and 100 non-beneficiaries). The beneficiary lists were obtained from mandal level Agriculture Officers. The households were selected with the help of agricultural officers who have obtained benefits of various components under NFSM scheme at village level.

Findings from Secondary Data:

Estimated the trends in area and fertilizer consumption for the last Three Five Year Plans (9th, 10th and 11th) in the state. The state Net Sown Area was increased from 97.29 lakh ha. to 112.88 lakh ha between 2003-03 to 2010-11 and the trend of average AGR was also found to be positive i.e., 1.69, 4.14 and 0.97 percent in 9th, 10th and 11th five year plan periods. The same trend has been observed in Net Irrigated Area to Net Sown Area annual AGR 0.36, 0.49 and 1.67 per cent during the above plan periods in the state respectively. The use of fertilizer consumption Kg/ha increased 88.83kg to 278.41 kg/ha from the year 1998-99 to 2010-11. The state area, production and yield average AGR found to be 3.04, 9.42 and 4.99 percent in 9th FYP and 9.57, 12.47 and 3.05 percent in 10th FYP respectively, whereas in 11th FYP 3.21, 1.36 and -1.45 per cent. The wheat crop area grown in Medak, Nizamabad and Adilabad districts only and meagre area grown under the above districts in the state. In the case of pulse crop average AGR of area, production and yield reported to be highest 5.40, 24.18 and 18.13 percent in 9th FYP than 10th and 11th FYP respectively.

With regard to NFSM districts Paddy crop area, production and yield average AGR found to be significant in 9th and 10th FYP whereas in 11th FYP average AGR reported to be negative in production -0.51 and yield -1.83 percent. In the case of Non-NFSM districts except yield growth rate in 11th FYP area, production and yield found to be positive under rice crop during 9th, 10th and 11th FYP. With respect to pulse crop all 22 districts average AGR of area, production and yield found to be negative during 10th and 11th FYP in the state.

It is observed that in the 11th FYP, the highest outlay of funds and expenditure incurred in the year 2009-10 under NFSM scheme. The average AGR of outlay and expenditure was 40.43 and 70.82 percent in the state and the percentage of achievement reported to be 30.39 percent in the state. It shows that the NFSM scheme has been implemented successfully.

The study has analysed the financial targets and achievements with respect to component categories of the NFSM programme. It comes out that higher funds were allocated and spent on seed distribution, whereas very meagre funds were allocated and spent on resource conversation techniques and tools during 11th FYP.

Lastly the percentage change of NFSM expenditure has no significant impact was found between the variables. Moreover the correlation co-efficient between percentage change in NFSM

expenditure to change in area and production was also reported negative impact under Paddy, Wheat and Pulse crops in the state.

Findings from Field Survey Data:

400 Households were selected from two sample districts of Nellore and Vizianagaram in the state. 300 Households were NFSM beneficiary and 100 Households were Non-NFSM beneficiary Households were selected. The average size of the sample Household is 4.13 and 4.40 for beneficiary and non-beneficiary respectively. The average percentage of members engaged in farming in both beneficiary and non-beneficiary farm family is 46.85 and 42.95 per cent. It was found that male and female ratio 86:13 and 87:12 from beneficiary and non-beneficiary category. The study found that 33 percent illiterates from both beneficiaries and non-beneficiaries. Around 42 to 45 percent members obtained primary, middle level and matriculation. Above matriculation got nearly 21 percent from both NFSM and non-NFSM-beneficiary family members respectively. According to caste category from both NFSM and Non-NFSM Households reported 47.33 and 53.00 percent are from OBC category followed by 39 and 34 percent from OC category, 12.33 and 10.00 percent from SC category and 1.33 and 3.00 percent from ST category respectively.

There is a higher annual family income from all sources is Rs.9,813 from non-beneficiary family due to more agriculture and salaried/pensioners income. There are 67.79 percent and 64.93 percent of operated area occupied by marginal and small farmers followed by nearly 22 percent of area under medium farmer's category from beneficiary and non-beneficiary farmers respectively.

Total owned land 1187.82 and 421.66 acres and Net Operated Area per Households stood at 4.33 and 5.21 acres in both NFSM and Non-NFSM farmers. Leased-in land found to be 120.50 (0.40%) acres and 100.60 (1.01%) from beneficiary and non-beneficiary farmers. Leased-out land area was not reported. Further cropping and irrigation intensity is slightly higher in NFSM sample beneficiary than non-beneficiary farmers respectively.

Canal irrigation is the major source of irrigation. There are two types of tenancy, firstly leasing-in land area found to be 120.50 acres and 56.40 percent of area under fixed rent in cash, followed by fixed rent in kind was 23.33 percent and share cropping was 20.87 percent area under NFSM farmers. In the case of Non-NFSM sample farmers reported that 46.50 percent area under fixed rent in cash followed by 33.50 per cent fixed rent in kind and 20.00 percent of area found under share cropping. Whereas leasing out land was not reported. On the other hand per acre mode of payment in cash or kind in-terms of value of rupees in cash or kind in quintal found to be very fewer differences between NFSM and Non-NFSM beneficiaries.

Net return per Household from NFSM beneficiaries (farm business income) accounts for Rs.58,843 and per acre net return was Rs.13,586. Moreover per Household total annual income from all sources stood at Rs.94,155 and non-farm income per Household was Rs.35,312. In the case of Non-NFSM average annual income per Household from farm business income was Rs. 65,793 and non-farm income was Rs.35,740. So the total income per Household was Rs. 1,01,533. On the other hand per acre productivity, gross return, cost of cultivation and net return of Paddy crop under NFSM beneficiaries were estimated and presented at 22.24 Qtls/acre, Rs.30465/acre Rs.19,200/acre and Rs.11,264/acre whereas Non-NFSM farmers per acre Paddy productivity, gross return, cost of cultivation and net returns were reported at 22.01 Qtls/acre, Rs.29,984/acre, Rs.20,264/acre, Rs.9,720/acre respectively. Therefore NFSM beneficiaries per acre productivity, gross returns and net returns per acre reported to be higher than Non-NFSM farmer productivity and returns, due to little impact of NFSM scheme benefits.

Total value of all farm assets per Household was at Rs.47,268 in NFSM beneficiaries and Rs.54,570 in Non-NFSM category. In terms of credit, commercial banks occupied first position in disbursing loans to both NFSM and Non-NFSM beneficiaries. The outstanding amount stood at Rs.34,623 per Household under NFSM category. Whereas 73 percent of Non-NFSM households availed credit from commercial banks and per Household outstanding loan amount was Rs.48,830. Primary Agriculture Cooperative Societies (PACs) is another important agriculture credit financial institution which accounts for 16.33 percent NFSM beneficiary the outstanding loan per Household was at 6452. Whereas 7 percent of Households taken loan from PACs and per Household outstanding loan amount under non-NFSM was Rs.2,870. Moreover informal credit was availed to the tune of 20 per cent by each Household from both NFSM and Non-NFSM category. The outstanding amount per Household was Rs.29,524 and Rs.34,670 from both beneficiary and non-beneficiary category from private money lenders. Maximum amount has been borrowed for productive purposes and the amount was Rs.77,662 and Rs.94,643 from both NFSM and Non-NFSM beneficiaries per Household.

In the course of primary survey, it was found that 100 percent sample farmers got NFSM guide lines such as aims, objectives and benefits through awareness programmes and trainings which were organized at village and mandal level by the Department of Agriculture. Moreover beneficiary farmers are also received information from Krishi Vignana Kendra and farmers/friends. It was found that 100 percent of Households received 50percent of subsidy from the HYV/Hybrid rice seed and other inputs. Micro nutrients received in 57 percent of Households, followed by incentives for lime acid soils 35 percent Household, plant protection chemicals 14.33 Households, knap scak sprayers 7.00 percent Households and 5.33 percent Households got 50 percent subsidy from pump sets, INM and IPM under NFSM scheme. It was found that per household average total benefit availed from various components under NFSM paddy crop was Rs.1,866. The annual usage of farm equipment like

pump sets were used 13.07 days covering 6.87 acres per beneficiary household and knap sack sprayers (manual and power operated) were used 2.41 days and benefited per beneficiary household was 5.18 acres.

During field survey, it was observed that the NFSM beneficiaries obtained various benefits by utilized various farm equipment being provided by the NFSM scheme. Majority beneficiary households expressed their opinion that the NFSM farm equipment has helped a lot to increase the productivity under rice crop. Pump sets and sprayers are provided benefits for good plant growth responded by 35.00 percent and 25 percent of beneficiary households respectively. As a part of NFSM scheme, the benefits were provided inputs like HYV/Hybrid seed, INM, IPM Micro nutrients and other farm equipment. As a result of which the paddy productivity was increased upto 10 percent.

Per acre paddy total cost of cultivation was found at Rs.19,202 and Rs. 20,264 in both NFSM and non-beneficiary farmer. Of all input costs, hired labour cost was higher in both NFSM and Non-NFSM beneficiaries and the total cost per quintal Paddy production was found to be Rs.863 and Rs.921 both NFSM and Non-NFSM sample farmers. On the other hand paddy crop in Rabi season cost of cultivation per quintal found to be lower, that is Rs.713 for NFSM beneficiary and Rs.804 non-beneficiary farmer. The cost of cultivation per acre and cost per quintal paddy produce found to be higher in kharif than rabi season, whereas under rabi season paddy crop net income per acre was found be more than kharif crop. According to field survey the farmers of both beneficiaries expressed their produce to sale private channels like local market, merchants and intermediaries.

The logistic regression equation was applied to identify the factors influencing the participation of NFSM beneficiary farmers. From the above analysis reveals that the independent variables like operational holdings (acres), family size, income from farming and credit availed (per acre) and farm asset value (in Rs.) are statistically significant at 1 percent probability level, and other variables age (in years), education dummy 1, education dummy 2, education dummy 3, caste dummy 1, caste dummy 2, caste dummy 3, ratio of irrigated to total operated area are turned out to be not statistically significant even at 10 percent probability level and the education dummy 3 is omitted by STATA package due to co-linearity problem.

In the course of field survey the study found three major constraints expressed by majority of beneficiaries 1) capacity building/technical advice is poor expressed by 43 percent of beneficiaries 2) Wide time gap between the purchase of inputs and receiving input subsidy amount and 3) initial payment for purchasing subsidy inputs is also major constrains under NFSM scheme. Some of the NFSM beneficiaries expressed their anguish about the unnecessary procedural delay for obtaining subsidies like asking land and related documents under the scheme. Most of the beneficiary farmers insisted on institutional credit facility and demanded inclusion of the same in the NFSM scheme for rice crop so as to get better access for loans easily.

NFSM beneficiaries made some suggestions for improvement of the scheme: 42 percent of beneficiaries had suggested to improve timely distribution of inputs, 27 percent beneficiaries stated that extend the benefits of farm machinery subsidy and supply of farm machinery to more number of beneficiary farmers and 25 percent beneficiaries reported that enhancement of minimum support price for rice through NFSM scheme. Irrigation support by digging bore wells on subsidy basis (11 percent), extension of marketing facilities (11.67 percent) and compulsory crop insurance (18.67 percent) are some of the major suggestions given by NFSM beneficiaries for better improvement of NFSM scheme under rice crop. With regard to non-beneficiary farmers about 35 percent expressed that there should be crop and farmer insurance incorporated in to the scheme.

The study found that there are some reasons for non-participation in the NFSM scheme by non-beneficiary farmers. Out of 100 non-beneficiaries 65 percent of non-beneficiaries reported that lack of knowledge about NFSM scheme besides participating in some other schemes like RKVY, NHM and ATMA etc. 28 percent of non-beneficiaries replied that inadequate supply of inputs and mostly the selection of beneficiaries based on ruling party in the state.

To conclude some suggestions have been made by non-NFSM beneficiary farmers for the effective implementation of NFSM scheme. 70 percent of non-beneficiary farmers opined that more number of awareness programmes needed to know the benefits from this scheme. 42 percent of the beneficiaries suggested extending agriculture extension services, whereas 35 percent beneficiaries who are marginal and small farmers insisted on the free supply of inputs.

POLICY IMPLICATIONS

- The NFSM scheme should ensure that timely supply of inputs in sufficient quantities to beneficiary farmers.

- More number of distributors under NFSM scheme should be provided, so that the beneficiary farmers can select the farm implement.

- Needy farmers should be provided inputs at more subsidy than present subsidy through NFSM scheme.

- Extend the institutional credit facility at low interest rate can protect the rural farmer from non-institutional credit. Therefore it should be incorporated in NFSM scheme.

- Conduct various awareness programmes include training programmes and agricultural extension programmes at village and mandal level. Canvas through electronic and print media in local language should be done.

- The NFSM scheme should extend skilled as well as farm experts are important for proper guidance to educate exclusively marginal and small farmers for utilizing inputs and modern technology.

- To extend the farm machinery like sanction of bore wells (solar) and supply of oil engines by NFSM scheme to wanted farmers can help to increase the productivity.

- The NFSM scheme should initiate to extend the market yards and storage facilities at mandal level in order to reduce private traders.

- Insurance for crop and farmer be made mandatory under the scheme as it helps in reducing farmers' suicides.

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CHAPTER – I

INTRODUCTION

1.1 Introduction:

Agriculture sector is enormously important for 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. Agriculture income considered as a primary source of income, while it provides raw material for a large member of industries (Government of India 2012-13). The experience of last three decades that the growth rate of food grain 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 growth rate of food grains decreased from 3.21 per cent to 1.04 per cent during the same time period. This is clearly reflected in the decelerated agricultural growth from 3.5 per cent during the period in 1980-81 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. (Devand Sharma 2010, Kumar 2013 and GOI 2012-13). Further the 'U'-Turn in agricultural production occurred mainly due to launching of several agriculture development schemes such as Rashtriya Krishi Vikas Yojana (RKVY), National Food Security Mission (NFSM), National Horticultural Mission (NHM) and various sub schemes (GOI 2010-13 Kumar).

1.2 NFSM in India:

The Government of India had launched National Food Security Mission (NFSM) in 2007. It is a Central Scheme for five years to increase production and productivity of Rice, Wheat and Pulses on a sustainable basis, so as to ensure food security of the country. The aim is to bridge the yield gap in respect of these crops through dissemination of improved technology and farm management practices at the beginning of 11th Five Year Plan. This is a crop development scheme aims at restoring soil health and achieving additional production, and extend improved technologies i.e. HYV seed, micro nutrients', soil amendment, integrated pest Management, Farm machinery and resource conservation technologies along with capacity building of farmers. The major interventions covered under NFSM scheme includes cluster demonstration of rice, wheat and pulses, distribution of improved varieties/hybrid seeds, need based plant and soil management resource conservation techniques/energy management, efficient water/application tools, cropping system based training and local initiatives award for best preforming districts.

The mission adopted two fold strategies to bridge the gap between demand and supply. First strategy was to expand area and the second was to bridge the productivity gap between potential and existing yield of food crops. Expansion of area approach was mainly confined to pulses and wheat and the rice crop was mainly targeted for productivity enhancement. The chief measures adopted to augment the productivity included 1. Acceleration of Quality Seed Production 2. Emphasising INM and IPM 3. Promotion of New Production Technologies 4. Supply of adequate and timely inputs 5. Popularising improved Farm implements 6. Restoring Soil Community and 7. Introduction of Pilot Projects like community Generator and Blue Bull, besides there was a key objective to generating employment opportunities.

As stated above, NFSM scheme aimed to escalate production of rice, wheat and pulses, the main target was to enhance farm productivity. So that the farming community retains its confidence in farming activity. During XI plan, NFSM rice was implemented in 144 districts of 16 states. NFSM-wheat was implemented in 142 districts of 9 states and NFSM pulse production Programme (A3P) was implemented in 468 districts of 16 states in the country. With these strategy and goals, NFSM scheme was implemented in 561 districts in 27 states in the country (GOI 2013). Along with the NFSM, RKVY and ATMA programmes were also launched during the same period. In addition there were several other state and centrally sponsored programmes running parallel with the NFSM programme. Aided by all the above efforts of the Central and State governments, rice production during the end of 11th Five Year Plan increased by 12.1 million tonnes, wheat production by 19.1 Million tonnes and pulses production by 3 million tonnes as compared the production during the base year of 2006-07. A total amount of Rs.4500 crores have been spent under NFSM during the 11th Five Year Plan (GOI 2014).

1.3. Salient Features:

1. According to NFSM report total financial implications of NFSM were to be Rs.4,882.48 crore during XI Plan (2007-12). Beneficiary farmers will contribute 50 per cent cost of activities/works to be taken up. The implementation of NFSM would result in increase in production of rice by 10 million tonnes, wheat by 8 million tonnes and pulses by 2 million tonnes by 2011-12. Restoring soil fertility and productivity at the individual for creating employment opportunities and enhancing for economy i.e. farm profits to restore confidence amongst the farmers.

2. Promotion and extension of improved technologies, i.e., seed, integrated nutrient Management including micro-nutrients, soil amendments, IPM and resource conservation technologies along with capacity building of farmers.

3. Flow of fund would be closely monitored to ensure that interventions reach the target beneficiaries on time.

4. The proposed interventions would be integrated with the district plan and fixed targets for each identified district.

5. Constant monitoring and concurrent evaluation for assessing the impact of the interventions for a result oriented approach by the implementing agencies.

Subsidies are also given for farm instruments, technologies such as rotovators, sprinkler sets, sprayers and other farm implements.

Production of breeder seeds is done under ICAR while certification and pulses are implemented by state and district agencies. For rice, all these are done by state government agencies at central and state level. The Mission is being continued during 12th plan with new targets of additional production. In the 12th plan, NFSM aims at raising grain production by 25 million tonnes, comprising of 10 million tonnes of rice, 8 million tonnes of wheat, 4 million tonnes of pulses and NFSM proposes to cover 3 million tonnes of coarse cereals and fodder crops by the end of 12th Five Year Plan period (2012-17). 12th plan aims to cover all the states of India with focus to productive areas to bridge the yield gap for additional production, while stability in high production areas would be achieved and the promotion of conservation agriculture practices.

The NFSM during 12th Five Year Plan will have five components 1. NFSM-Rice 2. NFSM – Wheat 3. NFSM-Pulses 4. NFSM – Coarse Cereals 5. NFSM – Commercial Crops. Central Government allocated over Rs.1800 crore to states under National Food security Mission (NFSM) in 2012 to raise food grains output by 25 million tonnes in the 12th Five Year Plan period. The Mission was extended beyond expected output during XIth Five Year Plan. With the objectives 1) Increasing production of rice, wheat, pulses and coarse cereals through area expansion and productivity enhancement in a sustainable manner in the identified districts of the country. 2)Restoring soil fertility and productivity at the individual farm level, and 3) Enhancing farm level economy (i.e Farm Profits) to restore confidence amongst the farmers. Uttar Pradesh got the maximum amount at Rs276.9 crores followed by Madhya Pradesh Rs.226.87 crores in India.

1.4. Review of Literature:

1. Government of India in its agricultural annual report (2010-11) stated that through new farm practices under NFSM nearly 50 per cent of rice districts (70 out of 143), 33 per cent of wheat districts (41 out of 138) and around 50 per cent of pulses crop districts (74 out of 159) have recorded more than 10 to 20 per cent increases in productivity compared to the base year of 2006-07.

2. NABARD consultancy services (NY) conducted a concurrent evaluation of NFSM by comparing NFSM and Non-NFSM districts in Rajasthan considering current year and 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 pulse 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 were generally higher.

3. Agricultural Finance Corporation Limited (AFCL) 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 recoded yield gain about two times and five times more than the non-NFSM districts during 2007-09 and 2008-09 respectively. The productivity of Wheat in non- NFSM districts had better yield gain 3.91 percent 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 2003-09 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 pulse 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 the corresponding figure of 6.99 per cent in non-NFSM districts.

4. Deepak Shah (2012) conducted a study about the impact of NFSM programme on pulses crops cultivation in the state of Maharashtra. According to him the net profit margins in the cultivation of pulses crops in NFSM districts were substantially high in 2008-09 as against 2006-07 and 2007-08 due to rise in yield levels, higher prices on offer for pulses, adoption of improved varieties of seeds in pulses crops cultivation, area under improved varieties, higher adoption of recommended practices such as sowing, seed and

other practices including application of organic manure, chemical fertilizers etc., assistance received under NFSM pulse programme.

5. Ravi Shankar Pardhu, Meena, Ashutosh Shrivasthava (2014) carried out to assess the impact of National Food Security Mission (NFSM) on paddy productivity in Bhandara district was classified as pre NFSM period (2006-07) and post NFSM period (2010-11) with a view to examine change in paddy production with implication of NFSM in the study area. A random sample of 50 paddy growers comprised 35 from small and 15 from medium farms. The primary data (2010-11) area, production of paddy (pre and post NFSM) and assistance during NFSM were collected with the help of pre tested schedule by interviewing the respondents. Under Pre NFSM, there were 98.79 ha. area within the production of 2699.04 quintals and post NFSM it increased upto 143.34 ha. and 5381.22 quintals respectively. Productivity of paddy cultivation was also found to be increased from 10.72 to 19.31 Q/ha. Due to implementation of NFSM, the area, production and productivity have been increased. So the NFSM programme would be beneficial to the sample farmers and about 90 percent farmers received improved varieties of seeds of paddy crop, 92 percent receiving training and assistance on IPM equally 88 percent received assistance from INM and only 66 percent received the various equipment's.

6. Ravi Shankar Pardhu, Ashutosh Shrivastava (2016) published the impact of National food Security Mission on paddy production in Bhandara district of Maharashtra. The district ranks first in paddy production. It shows that NFSM programme was significant impact on improving economic viability and profitability of paddy production in the study area. Promotion and adoption of those technologies will boost up income generation and better standard of living of farmers. This can help to avoid crop failures and service to humanity by reducing number of suicidal events by farmers in the concern region.

7. National Consultant, S.M. Kolhapur inspected Arjun Naik Thanda in Zaheerabad of Medak district in Telangana state. He enquired about the implementation of NFSM programme and the problems being faced by the farmers. How the Farmers improved seed technology and other modern biotechnology can help to increase productivity? Deccan Development Society (DDC) women farmers from Thanda explained their practice is deep rooted in traditional organic farming principles, where they use their own seeds and manures and are able to fetch good yields; cash support for the same from the government will be helpful they said.

1.5 Role of NFSM in Andhra Pradesh:

Andhra Pradesh state is identified as the bejewelled rice bowl of India. Agriculture plays a crucial role in the economy of Andhra Pradesh state and contributed 20.37 percent of state domestic product during 2010-11. A Large segment of population is dependent on agriculture sector for employment and income. Rice is a major food crop and staple food followed by Jowar, Bajra, Maize, Ragi and pulses. So agriculture is bedrock of the state's economy. The state comprising three regions and 14 districts of Rayalaseema and Telangana from a part of southern plateau and hill zone with 9 coastal districts from part of East-coast plain and hill zone. The state has the second largest coastal line (974 km) among all the littoral states in India. The state is endowed with two major rivers, the Godavari and the Krishna. Andhra Pradesh is a leading state in food grains production. Rice is the principal crop extensively cultivated in all districts of the state both kharif and rabi seasons. Food grain cropped area claimed 54.12 percent of total GCA. Among cereal crops Paddy is a major cereal crop and the area covered 30.75 percent of total GCA and largest grown area attained 77.16 percent of total cereal crops in the state followed by maize 5.81 percent. The other cereal cops of Jowar, Bajra and Ragi attained a small extent of area of total cropped area in the state. Further Bengal gram, Redgram and Black gram are important pulse crops covering 4.49, 3.78 and 3.01 percent area of GCA in the state respectively. So the total food grain crops area reported predominant position in the cropping pattern of GCA. The government of Andhra Pradesh will not compromise on food security situation, which it was monitoring meticulously on a day to day basis.

The government of Andhra Pradesh ensured food security by initiating steps to accelerate agricultural growth. It was focused on increasing cultivable area production and productivity of food grains. The productivity of food grains went up from 3,011 kg per hectare to 3,323 kg per hectare. So the food grain production went up from 137.28 lakh tonnes to 190.74 lakh tonnes in the period 2003-04 to 2007-08. The total rice crop production also itself increased from 89.53 lakh tonnes to 130.76 lakh tonnes during the same period. The extent of cropped area of food grains went up from 68.07 lakh hectares to 73.59 lakh hectares during the period 2003-04 to 2007-08.

At state level, the monitoring is undertaken by state Food security Mission Executive Committee (SFSMEC) under the chairmanship of chief Secretary. At district level, the monitoring is taken by District Food Security Mission Executive Committee (DFSMEC) under the chairmanship of district collector. National Food Security Mission (NFSM) was launched in Andhra Pradesh in 2007-08 covering 11 districts under rice crop in the state. The

objective of the scheme was increasing production of rice through increase in area and productivity. The area under rice crop covered 11 districts under NFSM scheme is shown in Table – 1.1

Table – 1.1
District Wise Area under NFSM – Rice in Andhra Pradesh

S.No	District	AREA (000 ha)								
		2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
1	Adilabad	51.99	78.00	2.00	90.55	11.00	67.68	--	--	--
2	Guntur	306.92	332.00	318.00	329.47	292.00	182.58	--	--	--
3	Khammam	175.96	195.00	80.14	218.25	165.00	152.84	--	--	--
4	Krishna	354.91	395.00	380.66	355.34	272.03	264.21	--	--	--
5	Mahabubnagar	147.96	144.00	156.94	196.70	172.07	129.87	--	--	--
6	Medak	92.98	124.00	81.81	144.56	137.03	108.49	--	--	--
7	Nalgonda	310.92	362.00	165.29	405.32	327.76	204.07	--	--	--
8	Nellore	234.94	257.00	113.53	270.86	254.57	251.37	--	--	--
9	Srikakulam	202.95	206.00	295.52	212.95	210.42	208.70	--	--	--
10	Visakhapatnam	98.98	102.00	108.52	117.55	112.12	102.78	--	--	--
11	Vizianagaram	126.97	131.00	175.31	133.54	124.57	125.70	--	--	--
12	Total	2105.47	2326.00	1878.61	2475.09	2079.69	1798.29	--	--	--

Source: Various issues of Statistical Abstracts in Andhra Pradesh, Directorate of Economics and Statistics, Government of Andhra Pradesh, Hyderabad

The Table 1.1 reveals that the total area under rice crop increased from 2105.47 thousand hectares to 2475.09 thousand hectares between 2007-08 to 2010-11. Further the rice cropped area has been declined 2079.69 thousand hectares in the year 2011-12 and 1798.29 thousand hectares in 2012-13 of selected districts under NFSM scheme due to transformation of land from food grain crops to commercial and horticultural crops in the state.

Apart from Rice crop, the NFSM scheme also covered pulse crop in the same year where the area under pulses crop have been fluctuating every year but productivity is comparatively lower than other food grain crops. Most of the farmers used to cultivate pulse crops under rabi season after harvesting of rice crop (Kharif). The scheme covers 14 districts in the state during the year 2007-08 and 2008-09. Further the NFSM scheme covered total 22 districts under pulse crop in the state of Andhra Pradesh during the years 2009-10, 2010-11, 2011-12 and 2012-13 (Table 1.2).

Table 1.2

District Wise Area under NFSM – Pulses in Andhra Pradesh

S.No	District	AREA (000 ha)								
		2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
1	Adilabad	91.91	94.11	84.77	86.00	63.10	33.90	--	--	--
2	Ananthapur	113.89	109.12	118.26	162.00	124.69	94.24	--	--	--
3	Cuddapah	82.93	83.09	93.15	100.00	109.79	123.74	--	--	--
4	East Godavari	116.89	79.09	64.89	58.00	65.30	50.34	--	--	--
5	Guntur	149.86	76.09	115.13	125.00	102.42	94.53	--	--	--
6	Khammam	56.95	44.05	42.91	45.00	27.20	21.90	--	--	--
7	Krishna	143.86	110.12	133.96	155.00	192.21	177.85	--	--	--
8	Kurnool	289.73	259.29	295.14	316.00	266.05	229.56	--	--	--
9	Mahabubnagar	130.88	125.14	160.13	175.00	167.30	42.53	--	--	--
10	Nalgonda	87.92	75.09	60.70	84.00	73.12	46.84	--	--	--
11	Nizamabad	73.93	65.07	64.89	63.00	47.31	53.50	--	--	--
12	Prakasam	231.78	178.20	167.45	209.00	169.33	147.44	--	--	--
13	Srikakulam	96.91	81.09	85.82	73.00	76.10	83.83	--	--	--
14	Warangal	54.95	47.05	61.75	55.00	40.17	26.89	--	--	--
15	Medak	--	--	156.99	138.00	112.72	74.47	--	--	--
16	Nellore	--	--	45.00	56.00	58.45	45.21	--	--	--
17	Visakhapatnam	--	--	9.42	16.00	21.06	21.12	--	--	--
18	Vizianagaram	--	--	40.82	42.00	42.22	40.23	--	--	--
19	Chittoor	--	--	8.37	14.00	19.95	11.10	--	--	--
20	Karimnagar	--	--	24.07	22.00	30.18	18.62	--	--	--
21	Rangareddy	--	--	63.84	69.00	57.01	17.38	--	--	--
22	West godavari	--	--	34.54	11.00	64.21	14.77	--	--	--
	Total	1722.37	1426.61	1932.00	2074.00	1929.89	1469.98	--	--	--

Source: Various issues of Statistical Abstracts in Andhra Pradesh, Directorate of Economics and Statistics, Government of Andhra Pradesh , Hyderabad

1.6 Main Objectives of the Study:

The NFSM is extended to 12th Five Year Plan due to its success in achieving the integrated 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. Given the above broad objectives, the study intends to achieve the following specific objectives listed below:

1. To analyse the trends in area, production, productivity of rice in the NFSM districts in Andhra Pradesh.
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.
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.

1.7 Methodology:

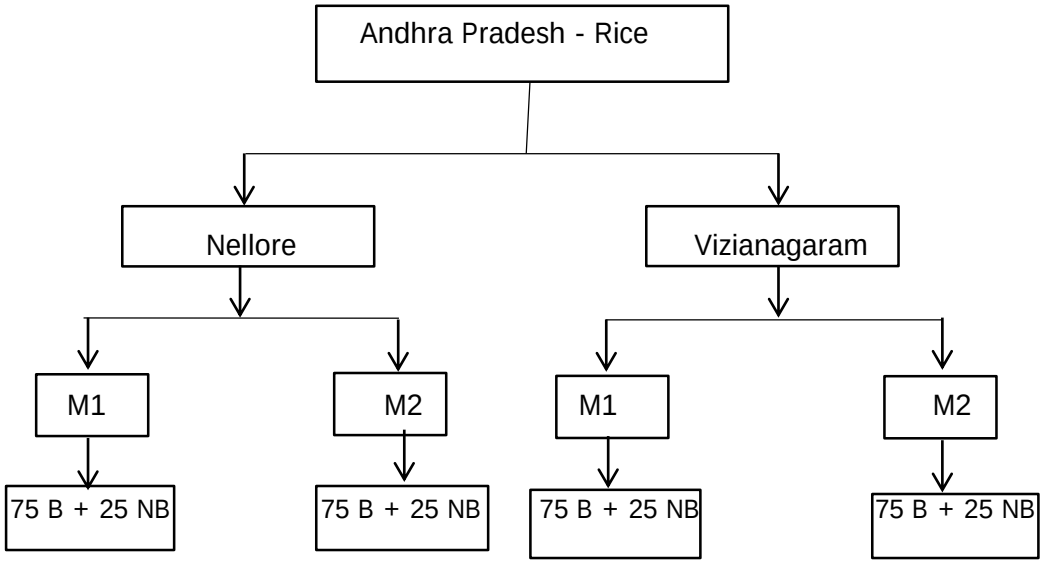
The present study is conducted in the state of Andhra Pradesh for rice. For the selection of beneficiary and non-beneficiary of NFSM (rice) a multi-stage sampling design was used (Flow chart – 1) The study covers two NFSM (Rice) districts viz. Nellore and Vizianagaram of Andhra Pradesh state according to highest and lowest production of rice among the NFSM districts as per methodology of the study. From each district two mandals were selected, at the second stage, drawing one mandal from nearby district headquarters and the second at a long distance of 15 to 20 kilometres from the district headquarters, subsequently at the third stage 75 beneficiaries (NFSM-Rice) and 25 non-beneficiaries were selected purposefully from each mandal totalling to a sample size of 200 households in each NFSM district. Altogether 400 households were selected for the study (300 beneficiary and100 non-beneficiaries). For the selection of beneficiary households in each mandal, the beneficiary lists were collected from the Mandal Agriculture Offices. After obtaining the beneficiary list, the households were selected who have obtained benefits of various components under NFSM programme.

For the selection of non-beneficiary households also the same sample villages as that of beneficiary households has been taken for the study. Different sizes of land holding viz. marginal, small, medium and large farmers were taken. For meeting the objectives, households' 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 cultivation of paddy crop, irrigation details, yield returns, reasons for adoption/non-adoption of NFSM interventions, constrains faced for availing the benefits, suggestions for improvement etc., were collected from the sample beneficiary and non-beneficiary farmers using a pre-tested questionnaire prepared by the coordinating centre, ISEC, Bangalore. The household data was collected mainly pertaining to the agricultural year 2013-14.

The primary household data were collected mainly pertaining to the agricultural year 2013-14.

Flow chart – 1

Multi-stage Sampling Method for the Study



In the case of secondary data with regard to cropped area, production and yield of rice, wheat and pulses for 9th, 10th and 11th Five Year Plans are used and the Average annual growth rates were estimated through the secondary data. The secondary data collected from various issues of statistical abstracts, Economic Surveys, District hand Books of Andhra Pradesh, published by Directorate of Economics and Statistics, Government of Andhra Pradesh. Directorate of Agriculture, Government of Andhra Pradesh, Hyderabad and Web site of NFSM Andhra Pradesh was also used.

Data Analysis: The year change in irrigated area, fertilizer use as well as growth in area, production and productivity of crops covered under NFSM scheme during 11th Five Year plan was estimated as mentioned below:

$$\text{Year of change (YYC)} = (CYV - PYV)/PYV \times 100$$

Where CYV = Current year value

PYV = Previous year value

Plan wise Average Annual Growth Rate was (AAGR) estimated by taking average of year to year change.

The AAGR revealed average change of year to year. The relation between percentage change in NIA to NSA, irrigation intensity, cropping intensity and percentage change in fertilizer consumption in Andhra Pradesh. The crops of rice, wheat and pulses

area, production and yield of the state, district wise both NFSM and non-NFSM AAGR were also estimated during 9th, 10th and 11th five year plan periods. The relation between percentage change in NFSM expenditure irrigated area, fertilizer consumption and production of Paddy, wheat and pulses were presented by estimating correlation co-efficient. Logit regression equation has been used to analyse the factors influencing the participation of farmers in NFSM scheme generalized linear model was used. The binary dependent variable was used as 1 for NFSM beneficiaries; 0 for non-beneficiary. The independent variables were for analysis such as age in years, education dummy 1 assumes the value of 1, if the level of education of the farmer is upto primary/till secondary, else 0; similarly, education dummy 2 assumes the value of 1, if the level of education of the farmer higher secondary, else 0. Education dummy 3 assumes the value of education of the farmer degree/ diploma, else 0. Operational holdings in acres, family size, in the case of caste categories, similar dummy variables have been introduced. In particular, the caste dummy 1 assumes the value 1, if the respondent farmer belongs to the SC/ST category, caste dummy 2 assumes the value 1, if the respondent farmer belongs to OBC category, the caste dummy 3 assumes the value of 1, if the respondent farmer belongs to OC category, farm income, ratio of NIA to NSA, credit availed per acre and farm asset value have been considered.

1.8 Structure of the Report:

The entire study report has been divided into six chapters. The first chapter constitute introduction, NFSM in India and salient features, objectives, review of literature, NFSM in Andhra Pradesh and objectives of the study, methodology and plan of the study. Chapter II represents time series analysis of impact of NFSM on food grain production in the state. Chapter III deals with the socio-economic profile of the sample farmers, cropping pattern and production structure of this study based on available information has been included. The findings from the primary data are discussed in Chapter IV. In chapter V factors influencing participation of farmers in NFSM, constrains and suggestions for improvement of NFSM are presented. Concluding remarks and policy suggestions are discussed in the VIth chapter.

1.9 Summary of the Chapter:

The Government of India, Ministry of Agriculture had launched the National Food Security Mission (NFSM) since 2007 in some selected areas of the country. The scheme covers crops like wheat, rice and pulses. The mission adopted two fold strategies to bridge the gap between demand and supply. The chief measures were adopted to augment rice

productivity including the supply of HYV/hybrid rice seed, emphasising INM and IPM promotion of new production technologies, supply of adequate and timely inputs, farm implements and restoring soil health by soil testing. These inputs are supplied at subsidized prices to the beneficiary farmers of rice crop under NFSM scheme.

The National Food Security Mission (NFSM) aimed to escalate production of rice, wheat and pulses, the main target was to enhance farm productivity. So that the farming community retains its confidence in farming activity. With these strategy and goals, NFSM scheme was implemented in 561 districts in 27 states in the country along with NFSM, RKVY programmes, there were several other state and centrally sponsored schemes also organized along with NFSM programme. Aided by all the above efforts of the state and central governments, rice production during the end of 11th Five Year Plan increased by 12.1 million tonnes. Wheat production by 19.1 million tonnes and pulse production by 3 million tonnes as compared the production during the base year 2006-07.

The Mission is still being continued during 12 FYP with new targets of additional production. In the 12th FYP, NFSM aims at raising grain production by 25 million tonnes, comprising 10 million tonnes of rice, 8 million tonnes of wheat, 4 million tonnes of pulses and the scheme covers 3 million tonnes of coarse cereals and fodder crops by the end of the 12th FYP (2012- to 2017).

Agriculture plays a crucial role in the state economy; major chunk of population depends on agriculture for income and employment. It is found that the Rice is a staple food crop followed by Jowar, bajra, maize and ragi and pulses. Rice is the principal crop extensively cultivated which claims 54.12 percent to total GCA. Paddy is a major cereal crop and covering 30.75 percent to GCA and largest grown area attained 77.16 percent of total cereal crops area in the state followed by maize 5.81 percent. Moreover Bengal gram, Redgram and Black gram are important pulse crops covering 4.49, 3.78 and 3.01 percent of GCA in the state respectively. Therefore food grain crops area reported predominant position in the cropping pattern of GCA in Andhra Pradesh state.

The government of Andhra Pradesh ensured food security by initiating steps to accelerate agricultural growth. The status of food grains productivity went up from 3011kg/ha to 3323 kg/ha and the production also went up from 137.28 lakh tonnes to 190.74 lakh tonnes in the period 2003-04 to 2007-08 respectively. The total production of

rice alone increased from 89.53 lakh tonnes to 130.76 lakh tonnes during the same period. The extent of cropped area of food grains went up from 68.07 lakh hectares to 73.59 lakh hectares during the period 2003-04 to 2007-08.

National Food Security Mission (NFSM) was launched in 2007-08 covering 11 districts under rice crop in the state. The objective of the scheme was to increase the production of rice through increase in area and productivity. The area under rice crop increased from 2105.47 thousand hectares to 2475.09 thousand hectares during 2007-08 to 2010-11. Further the rice crop grown area have declined to 2079.69 and 1798.29 lakh hectares in the year 2011-12 and 2012-13 of NFSM selected districts in the state due to transformation of cultivable area from food grain crops to commercial crops and horticultural crops, low level of rainfall besides power crisis in the state. In the case of pulse crops, the NFSM scheme covered 14 districts in the state during 2007-08 and 2008-09. Further, in the year 2009-10 the scheme was implemented 22 districts and the pulse crops area declined from 2074.00 lakh ha to 1469.98 lakh hectares between the year 2010-11 to 2012-13. Most of the farmers cultivated pulse crops under rabi season. So the pulse crops mostly cultivated under dry lands and depend on rain fall and this is not a principal crop in the state of Andhra Pradesh.

The primary household data were collected mainly pertaining to the agricultural year 2013-14.

CHAPTER – II

IMPACT OF NFSM ON FOOD GRAIN PRODUCTION IN THE STATE: A TIME SERIES ANALYSIS

2.1 Trend in Area and Fertilizer Use – Andhra Pradesh:

In this chapter, an attempt has been made to analyse the impact of NFSM on Paddy and Pulse crops based on secondary data in Andhra Pradesh state (United Andhra Pradesh).

The state is an agrarian character and it is considered as one of the most progressive state with respect to agricultural development, maintaining high level of crop production compared to rest of the states in India. Agricultural sector plays a vital role in the state economy and largest provider of employment. Agriculture is the main source of income and rapid agriculture growth is essential to achieve food security. Out of 76.50 lakh hectares of total cropped area 39.63 lakh hectares (51.53%) grown under food grain production recorded at 117.75 lakh tonnes. An optimistic trend was observed in food grain production.

RICE: Rice is the major principal crop extensively cultivated in all the districts of the state both Kharif and Rabi seasons. Andhra Pradesh stands seventh position in area and fourth position in terms of production of rice crop in India. The area under rice crop was 23.9 lakh hectares and the production of rice was 84.56 lakh tonnes and the productivity was 3522 kg/hectares during 2014-15 in the state.

PULSES: A Pulse crop includes Redgram, Bengal gram, Green gram, Black gram, Horse Gram, Cow gram and other pulses. The area under pulse crops accounted for about 13.55 per cent of total cropped area and the total pulse crop production was 9.49 lakh tonnes in the state during 2014-15. The share of pulses production increased slightly from 6.3 per cent to 6.7 per cent over a period of 20 years in the state (1992-93 – 2011-12). Among pulse crops, area and production with respect to Bengal gram crop has been increased. The Government of Andhra Pradesh has been encouraging production and productivity of food grain crops by introducing several developmental schemes in agricultural sector over a period of 20 years particularly after green revolution in the state.

Therefore Rice and Pulse crop production contributed about 77 per cent of total food grains in the state and the food grains production has also shown considerable increase in the state.

Table - 2.1
Trend in Area and Fertilizer Use – Andhra Pradesh

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	39.45	51.58	99.33	39.71	130.76	122.164	93.00
1998-99	45.38	60.92	110.74	40.98	134.23	123.034	88.83
1999-00	43.84	57.46	107.04	40.96	131.06	121.660	104.72
2000-01	45.28	59.16	112.20	40.35	130.66	120.719	98.04
2001-02	42.38	55.49	105.24	40.27	130.93	121.210	74.17
9th Plan Avg. AGR*	2.13	2.29	1.69	0.36	0.05	-0.19	-2.62
2002-03	36.14	45.36	97.29	37.14	125.53	118.801	87.10
2003-04	36.34	47.81	102.14	35.58	131.56	121.068	93.95
2004-05	38.81	49.87	104.32	37.20	128.50	120.004	112.60
2005-06	43.92	59.96	108.39	40.52	136.52	123.282	114.43
2006-07	44.53	60.61	102.38	43.49	136.10	125.126	130.04
10th Plan Avg. AGR	4.79	7.22	4.14	0.49	2.26	0.57	8.47
2007-08	46.44	62.85	108.43	42.83	135.33	125.123	148.05
2008-09	48.20	67.41	109.58	43.99	139.84	126.207	136.05
2009-10	42.14	57.64	100.85	41.79	136.77	124.548	243.74
2010-11	50.34	71.53	112.88	44.59	142.10	128.561	278.41
2011-12	50.90	67.85	111.61	45.61	133.29	123.285	245.41
11th Plan Avg. AGR	2.94	2.93	0.97	1.67	-0.29	-0.33	-10.79

Source:1) Various issues of statistical abstracts of Andhra Pradesh**,** Directorate of Economics and Statistics, Government of Andhra Pradesh, Hyderabad
2) Various issues of Seasonal crop reports, Directorate of Economics and Statistics, Government of Andhra Pradesh, Hyderabad

Table 2.1 trends in area and fertilizer use in Andhra Pradesh are shown in the above table during 1997-98 to 2011-12. During the 9th plan period average AGR in net irrigated area was estimated at 2.13 per cent. Whereas during 10th and 11th plan period the average AGR found to be at 4.79 and 2.94 per cent respectively. Likewise the gross irrigated area average AGR during the 9th plan period was 2.29 per cent and 7.22 per cent and 2.93 per cent during 10th and 11th plan periods. Net sown area average AGR was highest 4.14 per cent in the 10th plan period but in 9th and 11th period the average AGR in Net Sown Area reported to be 1.69 and 0.97 per cent respectively. So the average AGR reported increasing trend from 9th and 10th plan and declined 11th Five Year Plan period in the state. Percentage of Net Irrigated Area to Net Sown Area average AGR was found to be 0.36 per cent during 9th plan period followed by 0.49 and 1.67 per cent during 10th and 11th plan periods. The average AGR of irrigation intensity was highest 2.26 per cent in 10th Five plan period comparatively 9th and 11th plan periods. During the 10th plan period fertilizer consumption varied from 87.10 Kgs per hectare (2002-03) to 130.04 Kg per hectare (2006-

07). During 10th plan period fertilizer consumption has been increasing every year and the average AGR reported highest 8.47 per cent respectively. Whereas 9th and 11th plan periods the use of fertilizer consumption average AGR negatively reported -2.62 and -10.79 percent respectively in the state.

Therefore Table 2.1 indicates that the average AGR of Net Irrigated Area to Net Sown Area has been increased during the 9th, 10th 11th plan periods, moreover cropping and `irrigation intensity average AGR had slightly declined during 11th plan period. Moreover fertilizer consumption average AGR also declined -10.79 percent in the same plan period. Therefore percentage of NIA to NSA average AGR reported to be highest 1.67 percent in 11th plan period due to Jala Yagnam (importance of irrigation projects) and impact of NFSM scheme in the state.

2.2 Area, Production and Yield of Paddy, Wheat and Pulse Crops in the State:

Table 2.2 presented the plan wise area, production and yield trends of paddy crop in the state of Andhra Pradesh during 1997-98 to 2011-12 (9th, 10th and 11th plan). During the 9th plan the average Annual Growth Rate (AGR) of paddy crop area over the first four years 3.04 per cent followed by 9.57 per cent in 10th plan period and 3.21 per cent in 11th plan period. During the 10th plan period paddy crop grown areas under rice crop have been increasing significantly year after year from 28.22 lakh ha. to 39.82 lakh hectares where as in the 11th plan period the area cultivated under paddy crop frequently changing over the plan period and the highest area reported to be 47.51 lakh ha in 2010-11 (11th plan period). Likewise, paddy crop production also reported highest 144,19,313 tonnes during the same year 2010-11. Whereas in the case of productivity the average AGR reported to be highest 4.99 per cent in the 9th plan, whereas 3.05 and -1.45 per cent in 10th and 11th plan periods. In 10th plan period 1st three years paddy yield per hectare increased later it slightly declined. Whereas in 11th plan period the paddy yield per hectare have been slightly changing over the years and the yield per hectare shown declining trend up to 2010-11, and the average AGR of yield under rice crop during 11th plan was -1.45 per cent in the state (2007-08 to 2011-12).

Therefore it is evident from the table rice crop area, production and productivity average AGR have been changing over the three five year plan period. Whereas the yield average AGR reported negative -1.45 percent in 11th FYP in the state. Due to various reasons such as frequent changes in cropping pattern, natural calamities, power crises and declared crop holidays under rice crop in some parts of the Godavari districts in the state.

Table - 2.2

Trend in Area, Production and Yield of Paddy and Wheat- Andhra Pradesh

Year	Paddy			Wheat		
	Area (lakh ha)	Production (Tonnes)	Productivity (Qtls/ha)	Area (lakh ha)	Production (Tonnes)	Productivity (Qtls/ha)
1997-98	35.00	8510007	24.71	0.11	5990	5.37
1998-99	43.17	11878065	28.12	0.11	6437	5.6
1999-00	40.14	10637915	27.1	0.14	9056	6.7
2000-01	42.43	12458014	29.36	0.14	8121	5.96
2001-02	38.25	11389791	29.78	0.14	9486	6.87
9th Plan Avg. AGR	**3.04**	**9.42**	**4.99**	**5.77**	**13.66**	**7.04**
2002-03	28.22	7326786	25.97	0.11	14898	9.2
2003-04	29.75	8952802	30.11	0.12	6741	5.65
2004-05	30.86	9601045	31.11	0.09	4605	5.02
2005-06	39.82	11703624	29.39	0.11	8891	8
2006-07	39.78	11872130	29.84	0.10	8796	8.78
10th Plan Avg. AGR	**9.57**	**12.47**	**3.05**	**3.96**	**1.93**	**-0.03**
2007-08	39.84	13323800	33.44	0.08	7854	9.48
2008-09	43.87	14241133	32.46	0.14	15421	11.27
2009-10	34.41	10838267	31.5	0.10	10319	10.45
2010-11	47.51	14419313	30.35	0.10	13143	13.03
2011-12	40.96	12891792	31.48	0.08	10914	13.22
11th Plan Avg. AGR	**3.21**	**1.36**	**-1.45**	**5.35**	**18.42**	**9.44**

Source:1) Various issues of statistical abstracts of Andhra Pradesh**,** Directorate of Economics and Statistics, Government of Andhra Pradesh, Hyderabad

2) Various issues of Seasonal crop reports, Directorate of Economics and Statistics, Government of Andhra Pradesh, Hyderabad

Further the area under wheat crop reported very meagre comparatively rice crop in Andhra Pradesh during the 9th, 10th and 11th plan periods. Likewise in the 10th plan period the area, production and yield have been changing over the plan period. In the case of 11th plan period same trend was found under wheat crop too. The wheat crop average AGR of area, production and productivity was 5.35, 18.42 and 9.44 per cent respectively in the 11th plan period. The wheat crop grown area covered few districts in the state.

Table 2.3 presented the trends in area, production and yield of pulse crops. The average AGR of area, production and productivity was 5.40, 24.18 and 18.13 per cent respectively. Over the 9th plan period both production and productivity increased every year except 2000-2001. Whereas in the 10th Five year Plan the average AGR of pulses area, production and yield was -0.82, 7.93 and 9.09 per cent respectively. In the case of 11th plan period, average AGR of pulse grown area, production and productivity reported to be -1.56, -7.47 and -5.53 per cent respectively in the state.

Table - 2.3
Trend in Area, Production and Yield of Pulses- Andhra Pradesh

Year	Pulses		
	Area (lakh ha.)	Production (Tonnes)	Yield (Qtls/ha)
1997-98	15.65	515960	3.29
1998-99	15.87	826589	5.2
1999-00	16.47	800694	4.86
2000-01	19.03	1053468	5.53
2001-02	19.19	1138722	5.93
9th Plan Avg. AGR	**5.40**	**24.18**	**18.13**
2002-03	21.00	1063648	5.06
2003-04	21.85	1239061	5.67
2004-05	18.04	1017030	5.63
2005-06	17.82	1374649	7.71
2006-07	19.84	1346944	6.79
10th Plan Avg. AGR	**-0.82**	**7.93**	**9.09**
2007-08	21.13	1696611	8.02
2008-09	17.71	1449946	8.18
2009-10	19.33	1431422	7.4
2010-11	21.31	1440221	6.75
2011-12	19.30	1228959	6.36
11th Plan Avg. AGR	**-1.56**	**-7.47**	**-5.53**

Source:1)Various issues of statistical abstracts of Andhra Pradesh, Directorate of Economics and Statistics, Government of Andhra Pradesh, Hyderabad
2) Various issues of Seasonal crop reports, Directorate of Economics and Statistics, Government of Andhra Pradesh, Hyderabad

2.3 District wise growth of Paddy and Pulses crops and Impact of NFSM:

Table 2.4 presented district wise average Annual Growth Rate (AGR) of paddy crop area, production and yield under NFSM and non-NFSM districts in Andhra Pradesh state. It is seen from the table that during 9th five year plan average AGR of paddy crop area among districts reported to be highest 29.44 per cent in Adilabad district. The districts of Srikakulam, Vizianagaram, Visakhapatnam, Krishna and Nellore made a negative average AGR than other NFSM districts. Total 11 NFSM districts average AGR in area, production, yield reported to be positive in 9th and 10th five plan periods. Where as in 11th plan period

indicated that the average AGR of paddy crop area reported positive but in production and productivity found to be negative. Further the state of Non-NFSM districts total average AGR of area, production and yield reported positive during 9th and 10th plan. In the case of 11th FYP period non-NFSM districts growth rate of area, production and productivity reported to be 4.95 per cent, 3.61 per cent and -1.49 per cent respectively in the state. The study found the Paddy crop yield average AGR negative in total NFSM and non-NFSM districts in the state during 11th FYP.

Table - 2.4
Average AGR in Area, Production and Yield of Paddy in NFSM and Non-NFSM districts in Andhra Pradesh

S.No.	Districts	9th FYP			10th FYP			11th FYP		
		Area (%)	Production (%)	Yield (%)	Area (%)	Production (%)	Yield (%)	Area (%)	Production (%)	Yield (%)
NFSM Districts										
1	Srikakulam	-0.42	10.67	10.86	8.02	26.04	12.63	1.45	6.51	8.37
2	Vizianagaram	-4.01	6.95	10.86	7.50	44.24	27.30	0.72	-4.03	-6.28
3	Visakhapatnam	-0.53	20.13	18.19	11.88	39.31	20.54	9.26	21.67	-1.29
4	Krishna	-1.75	0.16	1.75	10.39	8.98	-2.41	-5.36	-5.62	1.19
5	Guntur	0.71	5.75	4.97	13.93	14.13	-2.34	-0.76	3.11	5.84
6	Nellore	-1.87	2.76	3.95	4.75	75.66	51.70	2.24	4.95	2.74
7	Medak	14.10	32.84	11.47	12.94	27.56	9.33	17.32	23.09	0.69
8	Mahabubnagar	13.95	26.89	8.44	3.22	9.59	5.18	4.66	0.76	-4.56
9	Nalgonda	4.72	13.23	4.09	25.70	32.57	6.62	5.28	3.24	-1.82
10	Khammam	4.37	17.92	9.92	15.83	34.78	13.19	12.72	12.07	-4.69
11	Adilabad	29.44	85.54	25.01	11.72	50.97	18.82	20.69	36.79	4.62
	Sub Total	1.51	7.37	5.02	9.10	13.75	3.79	2.06	-0.51	-1.83
Non-NFSM Districts										
12	East Godavari	1.45	10.00	8.69	8.02	11.58	1.95	-2.20	-4.40	-1.17
13	West Godavari	-1.33	3.55	4.77	7.40	9.79	1.90	-1.82	-2.81	-0.40
14	Prakasam	2.68	14.88	10.01	28.51	45.32	11.44	-0.46	-1.32	0.33
15	Kurnool	70.43	68.40	0.52	21.61	35.26	12.48	0.58	-0.05	1.01
16	Anantapur	7.95	17.35	8.36	0.41	7.39	9.84	3.17	-16.43	-23.78
17	Cuddapah	7.04	25.26	13.52	11.10	20.87	10.89	-2.82	1.88	9.19
18	Chittoor	-2.06	5.10	5.38	7.32	14.89	4.64	-0.02	2.00	2.56
19	Ranga Reddy	7.32	10.85	3.88	3.49	12.94	8.18	11.81	10.70	-1.35
20	Nizamabad	14.03	32.83	11.32	20.29	55.43	25.07	28.22	34.86	1.83
21	Warangal	38.81	57.96	8.20	15.22	29.24	8.73	19.16	26.96	-2.30
22	Karim Nagar	12.04	17.85	3.26	47.85	82.75	7.29	23.13	27.29	-1.36
	Sub Total:	8.09	14.73	5.57	10.46	14.81	4.60	4.95	3.61	-1.49
	Grand Total:	4.68	11.13	5.49	9.56	28.55	-10.34	3.22	1.17	-1.68

Source: 1) Various issues of statistical abstracts of Andhra Pradesh**,** Directorate of Economics and Statistics, Government of Andhra Pradesh, Hyderabad
2) Various issues of Seasonal crop reports, Directorate of Economics and Statistics, Government of Andhra Pradesh, Hyderabad

Pulses:

Table 2.5 shows the district wise average AGR in area, production and productivity of pulses in Andhra Pradesh state during the 9th, 10th and 11th Five year plan periods. It is

seen from the table that during 9th plan period AGR in area among 22 districts record growth rate has presented 43.77 per cent in Nellore district. Some of the districts average AGR in area found to be negative. Further average AGR in production reported positively except the districts of Nizamabad and Khammam -2.81 per cent and -1.69 per cent and the Prakasam district reported to be highest 107.97 percent respectively in the state. During 9th plan period the total average AGR in area, production and productivity of pulses were 5.40 per cent, 24.19 per cent and 18.09 per cent. In the case of 10th plan period out in the state average AGR in area positively reported only 12 and the total average AGR of 22

Table - 2.5

Average AGR in Area, Production and Yield of Pulses in NFSM districts in Andhra Pradesh

Districts	9th FYP			10th FYP			11th FYP		
	Area (%)	Production	Yield (%)	Area (%)	Production	Yield (%)	Area (%)	Production	Yield (%)
NFSM Districts									
Srikakulam	3.81	6.03	1.77	10.2	31.57	14.0	-5.30	-0.97	4.86
Vizianagaram	-3.03	9.12	9.11	6.75	41.74	26.4	-6.19	-1.04	5.67
Visakhapatnam	-0.71	14.84	15.0	-1.74	28.80	6.68	1.91	2.73	2.24
East Godavari	1.58	2.78	1.52	1.64	47.78	32.6	-11.95	5.40	17.38
West Godavari	-0.52	22.42	24.7	-6.65	17.02	8.36	157.4	145.65	-1.12
Krishna	3.45	16.71	13.9	-6.43	27.77	15.0	9.70	25.88	14.29
Guntur	2.74	14.16	15.2	-6.67	-15.40	13.2	-2.13	13.03	32.61
Prakasam	21.0	107.97	67.7	-4.21	3.71	26.0	-4.75	-15.88	-9.01
Nellor	43.7	69.68	17.2	4.70	2.86	29.5	7.86	13.46	8.03
Kurnool	18.8	58.03	31.3	10.3	-29.50	5.54	-1.33	-18.73	-
Anantapur	10.0	57.89	38.1	6.56	-97.20	43.5	4.49	-11.15	-
Cuddapah	29.7	99.20	54.7	6.24	-21.00	21.7	7.41	10.97	2.67
Chittoor	-3.07	4.04	5.71	0.07	-2.33	5.35	9.90	17.44	6.35
Rangareddy	3.15	43.71	39.0	-4.25	-18.22	6.80	-1.24	-16.99	-
Nizamabad	2.05	-2.81	-2.81	5.85	-11.31	-4.45	-9.95	1.64	13.13
Medak	7.86	56.68	48.0	-1.36	9.65	12.8	-4.10	1.01	7.18
Mahabubnagar	15.6	33.35	12.9	-1.54	-50.36	24.6	7.15	-10.91	-
Nalgonda	-2.90	39.85	53.9	5.42	36.54	11.7	-2.13	1.47	-4.35
Warangal	7.94	64.16	39.4	-0.22	7.30	16.4	-4.73	-5.35	4.90
Khammam	-5.74	-1.69	3.52	0.67	14.44	12.7	-14.41	-11.63	3.90
Karimnagar	-5.61	17.56	24.5	0.84	-15.62	21.3	-2.71	-4.53	-1.59
Adilabad	0.36	34.57	35.2	-0.74	6.69	19.7	-7.98	-12.20	-4.97
Total:	5.40	24.19	18.0	-0.82	-9.65	9.05	-1.49	-9.32	-7.81

Source: 1) Various issues of statistical abstracts of Andhra Pradesh**,** Directorate of Economics and Statistics, Government of Andhra Pradesh, Hyderabad

2) Various issues of Seasonal crop reports, Directorate of Economics and Statistics, Government of Andhra Pradesh Hyderabad

districts in area and production found to be negative -0.82 per cent and -9.65 per cent but the yield positively reported 9.05 percent in 10th plan period. During 11th plan period average AGR in area under pulse crops reported highest 157.40 percent in West Godavari district but the state total 22 districts average AGR was negatively reported (-1.68 percent). Whereas the total production and yield average AGR also reported negative -9.32 percent and -7.81 respectively in the state.

2.4 Financial Progress under NFSM in the 11th & 12th FYP, classification of out lay and expenditure in Andhra Pradesh.

It is observed from Table 2.6 the financial progress under NFSM districts during 11th plan period found that initial stage amount released was Rs.4,129.83 lakhs in 2007-08, which was increased to Rs.10,111.974 lakhs in the year 2011-12 under NFSM scheme in the state of Andhra Pradesh. The average AGR of the released amount to be 40.43 percent in 11th plan. The total expenditure during the same plan increased from Rs.2,356.43 lakhs to Rs.1,00,36,807 lakhs from the period 2007-08 to 2011-12 and the percentage of achievement was 99.26. During 11th Five Year Plan period the average AGR of expenditure reported to be 70.82 per cent. The achievement of average AGR at the end of the 11th Five Year Plan was estimated to be around 30.39 per cent. This expenditure indicates a positive signs of expenditure during 11th plan. During 12th plan the released amount was Rs.23,272.20 lakhs in 2012-13 lakhs and expenditure was Rs.20,812.48 lakh, and the percentage of achievement was 89.43. The year 2013-14 released amount and expenditure was Rs.34,173.89 and Rs.26,678.55 lakh respectively and the percentage of achievement was 78.07 percent.

Therefore the NFSM financial targets and achievements have been increasing year after year. So it may conclude that the fund allocation and also successful implementation of NFSM of scheme of Rice, Wheat and pulse crops in the state.

Table - 2.6
Financial Progress under NFSM in Andhra Pradesh

Year	Amount Released (Rs. in lakhs)	Achievement (Expenditure) (Rs. in lakhs)	Percentage of Achievement
2007-08	4129.83	2356.43	57.06
2008-09	10602.63	8281.55	78.11
2009-10	14494.11	12791.67	88.25
2010-11	13674.18	10775.24	78.80
2011-12	10111.97	10036.80	99.26
11th Plan Avg. AGR	**40.43**	**70.82**	30.39
2012-13	23272.20	20812.48	89.43
2013-14	34173.89	26678.55	78.07

Source: www.nfsm.gov.in

Table - 2.7

Category wise interventions outlay and expenditure for the 11th FYP in Andhra Pradesh (2007-08 to 2011-12)

	Outlay (Rs. in lakhs)					Expenditure (Rs. in lakhs)					% of Achievement				
Category wise interventions	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2007-08**	**2008-09**	**2009-10**	**2010-11**	**2011-12**
Eg: Demonstrations for improved technologies	500	327.68	1576.38	4484.32	2644.90	440.63	379.50	819.32	2110.28	3303.07	88.13	115.81	51.97	47.95	124.88
Local Initiatives	706.50	1777.78	874.20	10.38	139.58	377.50	1469.66	874.20	10.38	139.58	53.43	82.67	97.13	910.37	100.00
Miscellaneous	133.33	152.70	295.23	303.23	311.23	22.86	87.70	183.96	216.73	193.34	17.15	57.44	62.31	71.47	62.12
Seed Distribution (seeds)	1547.50	4937.09	14633.22	9627.11	7436.61	1063.75	3970.82	12344.70	9797.46	6899.00	68.74	80.43	84.36	101.77	92.78
Plant and soil protection management	207.50	831.46	1465.00	1850.00	918.00	207.50	501.84	1032.53	845.24	549.25	100.00	60.36	70.48	45.69	59.83
Soil Nutrients	825.00	787.00	2079.00	2026.18	1685.00	231.44	291.77	2729.46	2024.8	572.38	28.05	37.07	131.29	99.93	33.97
Resource conservation techniques/tools (mechanization)	210.00	1788.92	4524.68	4997.08	4117.26	12.75	1580.26	4523.46	4704.09	2117.97	6.07	88.34	99.97	94.14	51.44
Grand Total	4129.8	10602.63	25447.71	23298.30	17252.6	2356.43	8281.55	22507.64	19708.98	13774.59	57.06	78.11	88.36	84.63	79.04

Source:www.nfsm.gov.in

It is observed from the Table 2.7 discussed about the financial out lays, expenditure and the percentage of achievements with respect to the component categories of the programme. The category wise interventions outlay and expenditure reported to be the highest for seed distribution than other categories under NFSM scheme during the 11th Five Year Plan in the state. The out lay of funds sanctioned for seed distribution Rs.1,547 lakhs, 4937 lakhs, 14633 lakhs, 9627.11 and 7436.6 lakhs. Whereas the expenditure reported to be Rs.1063.75 lakhs, 3970.82 lakhs, 12344.7 lakhs, Rs.9797.46 lakhs and Rs. 6899.99 lakhs in the year 2007-08, 2008-09, 2009-10, 2010-11 and 2011-12 respectively under NFSM scheme in the state. On the other hand the lowest out lay of funds were incurred among category wise intervention in 2007-08 reported to be Rs.210 lakhs (resource conservation techniques/tools), followed by Rs.152.70 lakhs and Rs.295.23 lakhs (miscellaneous) in the year 2008-09 and 2009-10. Again the lowest expenditure was incurred Rs.10.08 lakhs and Rs.139.58 lakhs (local initiatives) in the years 2010-11 and 2011-12 respectively. On the other hand lowest expenditure was incurred on category wise intervention reported to be Rs.12.75 lakhs (Resource conservation techniques), Rs.87.70 lakhs (miscellaneous) Rs.183.96 (miscellaneous) Rs.216.73 (miscellaneous) and Rs.193.34 lakhs (local initiatives) in the year 2007-08, 2008-09, 2009-10, 2010-11 and 2011-12 respectively during the 11th Five Year Plan in the state under NFSM scheme.

Further the table shows that the percentage of achievement over the years 100 percent achieved in plant and soil protection management in the year 2007-08, 115.81 and 124.88 percent achieved in improved technologies (2008-09 and 2011-12) 131.29 percent in soil nutrients (2009-10), 101.77 percent achieved in seed distribution in the state under NFSM scheme.

2.5 Correlation between percent change in NFSM expenditure and percentage change in irrigated area, Fertilizer consumption. Area and production of Paddy, Wheat and Pulses in Andhra Pradesh:

Correlation means relation between two variables. The relation between percentage change in NFSM expenditure relating to irrigation/fertilizer in Andhra Pradesh during the period of 2007-08 to 2010-11 presented in Table 2.8. It revealed that due to 251.44 percentage change in NFSM expenditure related to 3.79 percentage change in irrigated area and -8.11 percent change in fertilizer consumption in the year 2007-08. Further there was -12.57 and 8.66 percent change in net irrigated area and fertilizer consumption respectively due to 54.46 percent change in total NFSM expenditure during 2008-09. During 2009-10

financial year -15.76 percent change in NFSM expenditure relating to 19.46 and 64.88 percent changed in net irrigated area and fertilizer consumption respectively. Where as in 2010-11 financial year -6.85 percent change in NFSM expenditure relating to 1.11 and 14.22 percent change in net irrigated area and consumption of fertilizer. Thus, on the overall, there was a negative significant correlation between total NFSM expenditure and net irrigated area (-0.18 percent) and fertilizer consumption (-0.71 percent) in the state.

Table - 2.8
Correlation between percent change in NFSM Expenditure and Irrigation / Fertilizer in Andhra Pradesh

Year	% Change Total NFSM Expenditure	% Change of Net Irrigated Area	% Change of Fertilizer
Change over 2007-08	251.44	3.79	-8.11
Change over 2008-09	54.46	-12.57	8.66
Change over 2009-10	-15.76	19.46	64.88
Change over 2010-11	-6.85	1.11	14.22
Correlation Coefficient		-0.18	-0.71

Source: www.nfsm.gov.in

In the case of correlation between NFSM expenditure relating to change in area and production of rice, wheat and pulses (Table 2.9). It is seen from the table the change in NFSM expenditure related to change in area and production positively related under rice

Table 2.9
Correlation between NFSM Expenditure and Area and Production of Paddy, Wheat and Pulses in Andhra Pradesh

Year	% Change Total NFSM Expenditure	% Change of Paddy Area Lakh Ha	% Change paddy Production '000 Tonnes	% Change Total NFSM Expenditure	% Change of Wheat Area Lakh Ha	% Change wheat Production '000 Tonnes	% Change Total NFSM Expenditure	% Change of Pulses Area Lakh Ha	% Change pulses Production '000 Tonnes
	PADDY			**WHEAT**			**PULSES**		
Change over 2007-08	251.44	1.94	6.88	65.30	96.35	65.30	-16.16	-14.54	-16.16
Change over 2008-09	54.46	-9.18	-23.89	-27.87	-33.08	-27.87	9.11	-1.28	9.11
Change over 2009-10	-15.76	15.54	33.04	2.16	27.37	2.16	10.23	0.61	10.23
Change over 2010-11	-6.85	-5.19	-10.59	-18.20	-16.96	-18.20	-9.42	-14.67	-9.42
Correlation Coefficient		-0.11	-0.04	-0.65	-0.49	0.86	0.78	-0.11	-0.04

Source: www.nfsm.gov.in

crop for the financial year of 2007-08. With respect of NFSM expenditure (11th plan) the percentage change in area and production negatively correlated with change in expenditure under paddy crop. Further Table 2.10 reveals that the change in NFSM expenditure while change in production of wheat was positively correlated in the 11th plan. Moreover in the case of pulses the correlation between NFSM expenditure related to percentage change in area and production reveals negative correlation -0.11 and -0.04 percent with change in 0.78 percent of total NFSM expenditure in the state (11th plan).

2.6 Summary of the Chapter:

1. For the last three Five Year Plans (9th, 10th and 11th) estimated the trends in area and use of fertilizer consumption. The estimations found that Net sown area has increased from 97.29 lakh ha.in 2002-03 to 112.88 lakh ha. in the year 2010-11 and the average AGR also reported to be positive trend 1.69. 4.14 and 0.97 percent in the Five year Plan periods (9th, 10th and 11th). The percentage of NIA to NSA average AGR in the state was found to be positive 0.36, 0.49 and 1.67 percent in 9th,10th and 11th plan periods. Irrigation intensity has also increased the average AGR was 0.05 percent to 2.26 percent from 9th to 10th FYP. Whereas in 11th FYP average AGR of irrigation intensity was declined -0.29 percent. The cropping intensity of state average AGR has increased 0.57 percent in the 10th FYP only. Moreover the use of fertilizer consumption average AGR per hectare found to be highest 8.47 percent during 10th FYP in the state.

2. It is found that the trend average AGR of area, production and productivity under paddy crop have been increased during 9th and 10th plan periods. Whereas under 11th plan average AGR of paddy crop productivity found to be negative -1.45 percent in the state. The average AGR trend under wheat crop shown positive growth in area production and productivity of all three five year plan periods (9th,10th and 11th plans) except the yield average AGR was slightly declined at 0.03. Whereas average AGR of pulse crop area production and productivity reported to be highest during 9th FYP comparatively 10th and 11th plan periods. Whereas in the 10th FYP area growth rate has negatively reported -0.82 percent. The 11th plan average AGR of area, production, productivity found to be negative trend under pulse crop in the state.

In the case of NFSM districts Average AGR in area, production and yield of paddy crop during 9th FYP found to be 1.51 percent, 7.37 percent and 5.02 percent respectively. During 10th plan period, the average AGR in area, production and yield trend also positive 9.10 percent, 13.75 percent and 3.79 percent. But in 11th FYP average AGR in terms of

area has shown only positive trend 2.06 percent and the production and yield reported to be negative -0.51 percent and -1.83 percent whereas non-NFSM districts during 9th plan were 8.09 percent. 14.73 percent and 5.57 percent and 10th FYP period the AGR in area, production and yield found to be 10.46 percent, 14.81 percent and 4.60 percent. The 11th plan FYP average AGR in area and production were 4.95 percent and 3.61 percent but yield average AGR was negative -1.49 percent respectively. So it may conclude that the total yield annual AGR reported, negative in both total NFSM and non-NFSM districts due to natural calamities and power crisis in the state.

In the case of pulse crops area, production and yield average AGR among three Five year plans 9th plan period growth rate reported to be positive in area 5.40 percent production 24.19 percent and yield 18.09 percent respectively. Whereas 10th and 11th FYP average AGR found to be negative under NFSM districts in the state.

During the 11th plan period highest funds were released and the expenditure has been increased. So the percentage of achievement was registered 99.26 percent in the year 2011-12. The average AGR of expenditure reported to be 70.82 percent. In the case of component wise financial outlay, expenditure and its percentage of achievement during the 11th plan period under NFSM scheme has been discussed. Large scale funds were allocated for seed distribution. Whereas the least funds were spent as well as the percentage of achievement was also low for resource conservation techniques/tools followed by miscellaneous.

Lastly correlation co-efficient between percentage change of total NFSM expenditure to percentage change in irrigated area and use of fertilizer consumption indicated that no significant impact was shown between the variables, Whereas the correlation coefficient between percentage change in NFSM expenditure to change in area and production were also reported negative impact on paddy, wheat and pulse crops in the state. Therefore it may conclude that there was no significant impact of percentage change in NFSM expenditure relating to change in area, production of paddy and pulse crops in NFSM districts of the state. So it may conclude that no significant change has been reported due to frequently occurred natural calamities, crop diversification from food grain crops to commercial crops, horticultural crops and power crisis are the reasons. In addition to this crop holiday has been declared by some of the pockets of Godavari districts due to the farmers are not able to meet the cost of cultivation (paddy) during the 11th Five Year Plan in the state.

CHAPTER – III

HOUSEHOLD CHARACTERISTICS, CROPPING PATTERN AND PRODUCTION STRUCTURE

3.1 Introduction:

In this chapter an attempt is made to analyse the socio-economic profile of the NFSM and Non-NFSM sample households based on primary level data, including details about size of family, gender and education, caste status, occupational income from agriculture and other sources, size of landholdings and Net Operated Area of operational holdings of the sample households. Details of characteristics of operational holdings, irrigation sources structure of tenancy, cropping pattern, costs and returns of rice crop per acre of the sample households have been discussed. Further value of farm assets holding by the sample households and available sources and purpose of credit also analysed both NFSM and Non-NFSM beneficiaries.

3.1.1 Demographic Profile:

Demographic pattern is one of the important indicators for development of farming community. Labour is primary source for agriculture. Hence education is a most significant factor for optimum utilization of natural resources like land utilization, cropping pattern and use of machinery. So the demography factor influences the farm production and enhancing economic and social conditions among the farming communities.

The Socio Economic profile of the sample Households is presented in Table 3.1. The total number of sample is 400. Among the districts in Andhra Pradesh, Vizianagaram and Nellore districts were selected for the study. The NFSM beneficiary farmers were 300 while the non-beneficiary farmers were 100 only. The average size of sample Household was 4.13 and 4.40 from both NFSM beneficiary and non-beneficiary Households. In the course of Households survey the percentage of male respondents were 86.33 and 87.00 per cent respectively from NFSM beneficiary and non-beneficiary households. While the percentage of female respondents were reported at 13.67 and 12.00 per cent reported from both NFSM and Non-NFSM sample Households. With respect to age group above 15 years male population found at 37.80 and 38.86 percent in both NFSM and Non-NFSM families. The percentage of adult female above 15 years of age was reported to be 37 to 39 percent respectively. Whereas the percentage of population below 15 years of age (children) was 23.18 and 23.41 per cent from NFSM and non-NFSM beneficiary HH respectively.

3.1.2 Educational Status:

Education is one of the important factors to determine the quality of the family members. The level of education standards plays an important role in decision making to productive activities in agriculture, implementation of modern technology and marketing abilities etc., Out of 300 NFSM sample Households members reported to be highest at 33.33 per cent were illiterates, 17.67 per cent educated upto primary level, 19.00 per cent studied

Table - 3.1

Socio-Economic Profile of the Sample Households (% of Household)

Characteristics			NFSM	Non-NFSM
Total households surveyed: numbers			300	100
Household size: numbers			4.13	4.40
% of HH members engaged in farming			46.85	42.95
Gender of the Respondent (%)		Male	86.33	87.00
		Female	13.67	12.00
Age group of the members (%)		Adult Males (>15 yrs)	37.80	38.86
		Adult Females (>15 yrs)	39.01	37.96
		Children (<15 yrs)	23.18	23.41
Education status of the family members (%)		Illiterate	33.33	33.00
		Primary	17.67	21.00
		Middle	19.00	19.00
		Matriculation/secondary	8.00	6.00
		Higher secondary	10.00	8.00
		Degree/Diploma	10.00	12.00
		Above Degree	2.00	1.00
Caste of households (%)		SC	12.33	10.00
		ST	1.33	3.00
		OBC	47.33	53.00
		General	39.00	34.00
Occupation income (Rs./annum/HH)		Only agriculture	58843	65793
		Own business	2080	1310
		Salaried/pensioners	19920	21950
		Wage earners	8512	8640
		Others*	4800	3840
		Average annual income from all sources	72057	81870
Net operated area	% of area	Marginal (0.1 to 2.5 ac)	38.82	29.54
		Small (2.51 to 5 ac)	28.97	35.39
		Medium (5.1 to 10 ac)	21.85	22.21
		Large (10.1 and above)	10.35	12.66
	% of holdings	Marginal (0.1 to 2.5 ac)	46.00	43.50
		Small (2.51 to 5 ac)	38.33	35.50
		Medium (5.1 to 10 ac)	20.00	12.50
		Large (10.1 and above)	6.67	8.50
	Average	Total (acres)	4.34	5.21

Source: Household survey data

upto middle standard, 8 per cent upto secondary level, 10 per cent of population had higher secondary and degree/diploma as well each and 2 per cent members studied upto post graduate level in NFSM sample Household s. Whereas literacy levels of Non-NFSM sample Households found that 33 per cent of population were illiterates, 21 per cent of population studied upto primary level, 19 per cent studied upto middle standard; 6 and 8 per cent of Households population studied upto matriculation and higher secondary level and the rest 10 per cent and one per cent of population holds degree and postgraduate level respectively from non-NFSM sample Households. The study covered all caste category of Households in both NFSM and non-NFSM sample farmers. Of the total NFSM sample Households 12.33 per cent HH covering S.C. population, 1.3 per cent ST category, 47.33 per cent from OBC and 39.00 per cent from general category population. On the other hand Non-NFSM category sample Households 10 per cent of sample Households from SC, 3 per cent from ST, 53 per cent from OBC and 34 per cent from general category Households were selected for the Households survey.

3.1.3 Annual Income of the Sample Households:

The total annual income per NFSM households from agriculture was found to be Rs.58,843, besides Rs.2,080 from own business, Rs.19,920 from salaried people and old-age pensions, Rs.8,512 from wage earners and Rs.4,800 from other sources. Therefore per Household average annual income from all sources were found to be Rs.72,057. On the other hand Non-NFSM households income from agriculture was found to be Rs.65,793, Rs.1,310 from own business, Rs.21,950 from salaries/pensions, 8640 from wage earners and Rs.3,840 from other sources of income. The average annual income from Non-NFSM category per HH from all sources stood at Rs. 81,870.

3.2. Characteristics of Operational Holding:

Agriculture plays a vital role in Andhra Pradesh economy, around 63 per cent of working population depends on agriculture for their livelihoods Table 3.2 presented the characteristics of operational holdings of sample Households in the study area. It is seen from the table that the total own land was 1187.82 acres in NFSM and 421.66 acres of NFSM and Non-NFSM households and per Households stood at 3.96 acre and 4.21 acres respectively. Likewise per household own cultivated land was 3.93 acres and 4.20 acres and leased-in-land was 0.40 acres and 1.01 acres reported by NFSM and Non-NFSM category of farmers. Whereas leased-out land was found to be zero from both NFSM and Non-NFSM categories respectively. Per household Net Operated Area (NCA) and Gross

Cropped Area (GCA) found to be 4.33 acres and 5.21 acres and 6.62 acres, 7.99 acres of NFSM and Non-NFSM category farmers. In the case of Irrigation per Household Gross Irrigated Area and Net Irrigated Area was 4.75 acres, 5.64 acres in NFSM beneficiaries and 3.51 acres and 4.10 acres from Non-beneficiaries. So, the Non-NFSM beneficiaries per household irrigated area reported higher than beneficiary farmers. Further, the cropping and irrigation intensity found to be higher under Non-NFSM farmers than NFSM category farmers.

Table - 3.2
Characteristics of operational holdings of sample Households (acres per Household)

Land details	NFSM	Non-NFSM
1. Total owned land	3.96	4.21
2. Un-cultivated land/Fallow land	0.03	0.01
3. Cultivated land (Own)	3.93	4.20
4. Leased-in land	0.40	1.01
5. Leased-out land	0.00	0.00
6. Net Operated Area(3+4)	4.33	5.21
7. Gross Cropped Area	6.62	7.99
8. Gross Irrigated Area	4.75	5.64
9. Net Irrigated Area	3.51	4.10
10. Cropping Intensity (%)	152.80	153.37
11. Irrigation Intensity (%)	135.42	137.54

*Cropping Intensity= (Gross Cropped Area/Net Cropped Area)*100
**Irrigation Intensity= (Gross Irrigated Area/Net Irrigated Area)*100
Source: Household survey data

3.3 Sources of Irrigation and Structure of Tenancy:

Irrigation helps to stabilising the farmer's output and yield level. It also plays a protective role during drought conditions. Irrigation is an important in the context of increasing income and employment, which is positively and closely related to output. Without irrigation facility farming is very difficult.

Table 3.3 shows the distribution of area by sources of irrigation. (Percentage to total area). The total area under NFSM beneficiaries are found to be 1299.32 acres. Out of which the highest irrigated area of NFSM farmers reported to be 350.29 acres (26.83%) from canal irrigation followed by tanks 334.78 acres (25.64%), canal+tube well (Electric/diesel) 233.62 acres (17.89%) and only tube well (electricity/diesel) was 134.73 acres (10.32%). The rainfed area reported to be 245.90 acres (18.95%) under NFSM sample farmers. Whereas the total area under Non-NFSM farmers was at 521.26 acres. Out of the total area 123.15 acres (23.68%) area irrigated by canal followed by tanks and

other 118.90 acres (22.81%), 91.02 acres (17.27%) canal+tubewell (electric/diesel) and 78.76 acres (15.11%) only tube well (electric/diesel). The rainfed area was 110.15 acres (21.13%) reported under Non-NFSM households. Further the table shows that the NFSM sample farmers total irrigated and rainfed area per Households stood at 3.51 acres and 0.82 acres whereas Non-NFSM per Households irrigated and rainfed area were reported to be 4.11 acres and 1.09 acres respectively.

Table - 3.3

Distribution of Area by Source of Irrigation (% to the total area)

Land details	NFSM	Non-NFSM
1. Only Canal	350.29 (26.83)	123.15 (23.68)
2. Only Tube well (Electric/diesel)	134.73 (10.32)	78.76 (15.11)
3. Canal+ Tube well (Electric/diesel)	233.62 (17.89)	90.02 (17.27)
4. Tank and others (Open well)	334.78 (25.64)	118.90 (22.81)
5. Rainfed Area	245.90 (18.95)	110.15 (21.13)
6. Total irrigated area per hh (acres)	3.51 (80.68)	4.1 (78.87)
7. Total rainfed area per hh (acres)	0.82 (18.95)	1.09 (21.13)

*Figures in the parenthesis indicates percentage to the total

Source: Household survey data

Table 3.4 depicted the nature of tenancy in the study area. It can be seen that there are two types of leasing-in and leasing-out terms. Among the terms of leasing in NFSM sample Households expressed, 56.40 per cent of area fixed rent in cash, followed by 23.23 per cent of area fixed rent in kind and 20.37 per cent of area share cropping, as against leasing out land was not there. In the case of Non-NFSM sample farmers cropped area, there was 20 per cent reported share cropping and 46.50 per cent rent in cash, remaining 33.50 per cent under fixed rent in kind. In fact, the value of fixed rent per acre of Rice produce in cash and fixed rent in kind quintal per acre found to be very meagre difference between NFSM and Non-NFSM beneficiaries. So the NFSM programmes have not been effected farming community who had leased in land of both NFSM and Non-NFSM farmers in our study districts.

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	20.37	0.00	20.00	0.00
Fixed rent in cash	56.40 (8050.60)	0.00	46.50 (8180.20)	0.00
Fixed rent in kind	23.23 (7.30)	0.00	33.50 (7.40)	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	0.00

Note: In case of fixed rent total value of cash (Rs/acre) kind/(Qtl/acre) paid / received for leasing-in in the parenthesis.
Source: Household survey data

3.4 Cropping Pattern and per acre costs and Returns:

Table 3.5 presented the cropping pattern of sample households. It is seen from the table that percentage of area under different crops to the total gross cropped area. The table shows that the total gross cropped area (1299.32 acres).Out of total gross cropped area Paddy crop was covered by 96.32 per cent under NFSM beneficiaries. With respect to pulses cultivation Gram cropped area was covered by 1.55 per cent. Under oil seeds crop cultivation, Groundnut and sunflower covered at 0.22 and 0.15 percent respectively. Fruits and Vegetables covered 1.73 per cent and 0.04 per cent of the Gross cropped Area under NFSM sample HH. Under Non-NFSM farmers per Household, out of the total Gross Cropped area (521.26 acres) Paddy crop was covered the highest percentage at 99.12 per cent of area and fruit crops covered at 0.88 per cent of GCA under Non-NFSM sample Households.

Table 3.6 (a) presented income from agricultural and non-agricultural household from NFSM and Non-NFSM beneficiaries. The value of output (main and by product) per Household was Rs.1,31,944 and value of output per acre was Rs.30,465 in NFSM farmers. Per Households cost of production was Rs.73,101 and per acre cost of production was 16878. Whereas net return per Household (farm business income) was Rs. 58,843 and per acre net return was Rs.13,586. The non-farm income per Household reported to be Rs.35,312. So total income from both agricultural and non-agricultural source NFSM farmers per Household was Rs.94,155. In the case of Non-NFSM farmers, value of output (main+by product) per Household was Rs.1,56,299 and per acre value of output was Rs.29,985. Per Household cost of production was Rs.90,505 and per acre cost of production was Rs.17363. Net returns per Household (farm business income) was Rs.65,793 and per

acre net return was Rs.12,622. Non-NFSM farmer per Household Non-Farm income estimated at Rs.35,740 and per Household total income from all sources stood at Rs.1,01,533.

Table - 3.5
Cropping pattern of Sample Households (% of Gross Cropped Area)

Name of the Crop	NFSM	Non-NFSM
Cereals		
Paddy	96.32	99.12
Wheat		
Maize		
Jowar		
Bajra		
Ragi		
Minor Cereals		
Pulses		
Tur		
Gram	1.55	
Other pulses		
Oilseeds		
Groundnut	0.22	
Sunflower	0.15	
Soyabean		
Rape & Mustard		
Other Oilseeds		
Others		
Cotton		
Jute & Mesta		
Sugarcane		
Fruits(Mango)	1.73	0.88
Vegetables	0.04	
Flowers		
Spices		
Plantation		
Fodder		
Forest species		
Others		

Source: Household survey data

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)	131944	30465	156299	29985
Cost of production	73101	16878	90505.5	17363
Net returns (Farm business income)	58843	13586	65793	12622
Non-farm income	35312		35740	
Total income	94155		101533	

Source: Household survey data

It is seen from the Table 3.6 (a) presented NFSM and Non-NFSM farmer per Household and per acre cost of production revealed that the NFSM beneficiary Households cost of production value was lower than per Household Non-NFSM farmer, due to impact of implementation of NFSM scheme RKVY and other schemes like HYV seed, Fertilizers, chemicals and farm mechanization equipment's (mini tractors, rotavators, drum seeder, seed drills, sprayers and pump sets etc.). Therefore NFSM beneficiary per Household and per acre cost of cultivation were reported to be lower comparatively Non-NFSM per Household and per acre cost of cultivation. On the other hand NFSM beneficiary per Household net return from farm business income is lower than Non-NFSM farms due to net operated area per Household is higher under Non-NFSM farm category. So it may conclude that the impact of NFSM scheme on crop production was positive. Table 3.6 (b) presented the estimations of crop wise per acre costs and returns among sample Households. NFSM beneficiary per acre yield, gross return, cost of cultivation and net return under paddy crop were at 22.24 Qtls per acre, Rs.30,465 per acre, Rs.19,200/acre, and Rs.11,264/acre respectively. While the Non-NFSM farmers Paddy crop per acre yield gross returns, cost of cultivation and net returns were at 22.01 Qtls/per acre, Rs.29,984/acre, Rs.20,264/acre and Rs.9.720/acre. Rice is a major cereal crop and NFSM beneficiaries per acre yield, gross returns and net returns were higher than Non-NFSM farmers. It may conclude that the impact of NFSM scheme providing benefits and subsidies to NFSM beneficiaries. Therefore all these subsidy inputs leads to reduce the cost of cultivation when compare to Non-NFSM beneficiaries.

The sample Households per acre productivity of gram stood at 2.75 Qtls/per acre in NFSM and 2.62 Qt/per acre in Non-NFSM farms. The NFSM Gross return and net return per

acre was also revealed higher than that of Non-NFSM farms. The NFSM beneficiaries were availing all the benefits being supplied by the department of agriculture in the state. Hence per acre cost of cultivation has been declined under NFSM farmers. Therefore all these benefits causes lead to increase per acre yield, net and gross returns of NFSM farms than Non-NFSM farms of the sample farmers.

With respect to per acre productivity of oilseeds such as groundnut was 2.70 Qtls/per acre in NFSM sample Households and 2.60 Qtls/per acre in Non-NFSM beneficiary Households and the gross returns per acre stood at Rs.10,700 in NFSM and Rs.9,880 in Non-NFSM. Per acre cost of cultivation stood at Rs.6,187 in NFSM and Rs.6282 in Non-NFSM farms. Net return per acre was Rs.4,513 in NFSM per Household and 3,590 in Non-NFSM per Household. The per acre net return is higher in NFSM beneficiaries due to seed, fertilizer and agriculture farm implements like supply of pump sets, sprayers etc. All these subsidy inputs cause to reduce the cost of cultivation and increase in net returns than Non-NFSM farms per Household under groundnut crop. In the case of per acre sunflower crop productivity, gross return cost of cultivation and net return of NFSM farms were 2.55 Qtl/pre are, Rs.10,455/acre, Rs.5,095/acre, and Rs.5,360/acre respectively. On the other hand per acre productivity, gross return, cost of cultivation and Net return of Non-NFSM beneficiary under Sunflower crop were 2.62, Qtls/per acre, Rs.10,742/acre, Rs.5,239/acre and Rs.5,503/acre. Therefore, the higher productivity was reported under NFSM than Non-NFSM farms of the sample Households.

Further the table presented per acre productivity of fruits stood at 32.98 Qtls in NFSM and 31.59 Qtls in Non-NFSM category. The net returns stood at Rs.39,302 per acre in NFSM and Rs.34,997 in Non-NFSM farms. In the case of vegetables, per acre productivity was found to be higher at 118.25 Qtls in NFSM and 112.96 Qtls in Non-NFSM farms including, net return stood at Rs. 56,760 in NFSM and Rs.44,055 per acre in Non-NFSM beneficiary. Per acre productivity and net returns stood at higher in NFSM beneficiaries than Non-NFSM beneficiaries due to supply of subsidy HYV seeds, fertilizer, pesticides and other farm equipment like sprinklers, sprayers, pump sets which reduces per acre costs and it leads to increase in productivity as well as net returns of NFSM beneficiaries compared to non-beneficiaries.

Table - 3.6 (b)
Crop wise per acre costs and returns among the sample Households

Name of the Crop	NFSM				Non-NFSM			
	Yield (Qtls/ acre)	Gross returns (Rs. / acre)	Cost of cultivation (Rs. / acre)	Net Returns (Rs. / acre)	Yield (Qtls/ acre)	Gross returns (Rs. / acre)	Cost of cultivation (Rs. / acre)	Net Returns (Rs. / acre)
Cereals								
Paddy	22.24	30465	19200	11264	22.01	29984	20264	9720
Wheat								
Jowar								
Bajra								
Maize								
Ragi								
Minor Cereals								
Pulses								
Tur								
Black Gram	2.75	16179	5240	10930	2.62	15196	6140	9056
Other pulses								
Oilseeds								
Groundnut	2.70	10700	6187	4513	2.60	9880	6282	3590
Sunflower	2.55	10455	5095	5360	2.62	10742	5239	5503
Soyabean								
Rape & Mustard								
Other Oilseeds								
Others								
Cotton								
Jute & Mesta								
Sugarcane								
Fruits	32.98	79152	39850	39302	31.59	76657	41680	34977
Vegetables	118.25	106425	49665	56760	112.96	96016	51961	44055
Flowers								
Spices								
Plantation								
Fodder								
Forest species								
Others								

Source: Household survey data

3.5 Assets Holdings:

Farm assets are the prime indicator for economic back ground of the farmer. In the case of house hold survey collected the farm assets holding of the household and value of the asset. So this information clearly indicates that how economically sound they are. So, it is need to analyse the assets holding per Household of the farm family. Table 3.7 shows the farm assets holding by sample households under land development, tillage and seed bed preparation equipment such as Tractor/mini tractor value occupied highest position (Rs.5,783 per Household) followed by Tiller (Rs. 633 per Household) ploughs (Rs.420 per Household) and cultivators (Rs. 210 per Household) in NFSM beneficiary per Household. In Non-NFSM sample Households there was only two equipment's namely Tractors and ploughs, and their value was estimated at Rs.4,000 per Household and Rs.640 per Household. Sowing and planting equipment in NFSM households were reported such as Seed Drill and Drum Seeder and their value was estimated at Rs.341 per HH and Rs.250 per Household. Whereas Non-NFSM Households have not undertaken any kind of sowing and planting. The plant protection equipment was reported only sprayers at Rs.4,489 per Household and at Rs.5,690 per Household of both NFSM and Non-NFSM farmers. With regard to harvesting and threshing equipment only Rs.90 per Household from NFSM farmers was reported. No equipment was reported to be used in harvesters, cutters and leveller blade under post-harvest management and residue management. With regard to harvesting and threshing for rice crop farmers used to lend the machinery for rental purpose at the time of post-harvest seasons under NFSM and Non-NFSM sample Households. Under water lift implements pump sets occupied first position at Rs.22,205 per Household in NFSM and Rs.33,550 per Household from Non-NFSM sample farmers. Sprinklers value was reported at Rs.5,000 per Household from NFSM farmers only. The value of other assets per Household stood at Rs. 7,847 in NFSM and Rs.8,690 in Non-NFSM farms. Total value of all the farm assets stood at Rs. 47,268 in both NFSM and Rs.54,570 in Non-NFSM farmers. Therefore, it may conclude that the economic condition of sample farmers per household under Non-NFSM farmers are better compared to NFSM farmers.

Table - 3.7
Farm assets holding by sample Households (Rs./ Household)

Equipment code	Implements	NFSM Household		Non-NFSM Households	
		No.	Value	No.	Value
Land development, tillage and seed bed					
1	Tractor/mini tractor	5	5783	2	4000
2	Rotavator				
3	Tiller	3	633		
4	Cultivators	4	210		
5	Ploughs		420		640
6	Harrow				
7	Others				
Sowing and Planting equipments (8 to 13)					
8	Seed drill	2	341		
9	Drum seeder		250		
10	Transplantor				
11	Furrow opener				
12	Seed cum fertilizer drill				
13	Others				
Plant protection equipments (14 & 15)					
14	Sprayers	178	4489	65	5690
15	Other Plant protection				
Harvesting and threshing equipments (16 to 20)					
16	Cutters				
17	Harvesters				
18	Thresher	2	90		
19	Laveller blade				
20	Others				
Equipments for residue management (21 to 23)					
21	Brush cutter				
22	crusher				
23	Others				
Post harvest and agro-processing machines (24 &					
24	Chopper				
25	Others				
Water lifting implements (26 to 28)					
26	Pumpset	105	22205	41	35550
27	Sprinkler	5	5000		
28	Others Farm House				
Others					
29	Others	250	7847	10	8690
Grand Total		638	47268	26	54570

Source: Household survey data

3.6 Sources and purpose of credit:

The farmers of developing countries like India agriculture credit appears to be an essential input. Mostly marginal and small farmers require more credit for the purpose of purchasing seeds, fertilizers, pesticides, make payments for labour etc., However their

savings are very meagre. So they have little chance to save the money. Therefore agricultural credit plays a prominent role in the improvement of agriculture output. It is an important component in modernization of agriculture. So it is necessary to analyse the economic condition and availability of credit of the farm families. Table 3.8 shows the details of source of credit by the sample households. The table clearly shows that the sample households availing credit from both the commercial banks and PACS. The amount of outstanding loan per HH was at Rs.34,628 and at Rs.6,452 respectively in NFSM category. In Non-NFSM category 73 per cent and 7 per cent of Households availed credit from the commercial banks and PACs subsequently the outstanding amount per Household was Rs.48,830 and 2,870. In NFSM sample HH only 19 per cent Households availed formal credit from local money lenders and outstanding amount was Rs.29,524 per Household. Whereas under Non-NFSM farmers only 20 per cent farmers availed credit from local money lenders and their outstanding credit was Rs.34,670 per Household.

Table 3.9 shows the details of purpose of credit by sample Households. The majority of sample Households had taken credit for both productive and non-productive uses. The maximum credit borrowed for the purpose of Agriculture and animal husbandry Rs.64,701 and Rs.12,944. So the total credit per Household stood at RS.77,662 for productive purposes. Whereas for un-productive purposes such as housing, marriage and educational purposes. NFSM farmers per Household borrowed credit at Rs.21,573 and Rs.8,629 respectively. On the other hand Non-NFSM farmers per HH credit reported under productive uses such as agriculture and animal husbandry purposes were at Rs. 87,171 and at Rs. 7,472 followed by non-productive uses per Household reported to be at Rs.17,434 and at Rs.12,453 respectively for social and other expenditure purposes.

Therefore it may conclude from the above discussion both beneficiary and non-beneficiary farmers borrowed money from productive purposes like agriculture as well as animal husbandry from institutional finance. Marginal and small farmers have scope to get subsidy loans from institutional finance which are the only source for obtaining loans by the farmers.

Table - 3.8
Details of source of credit by the sample Households

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)
1.Commercial Banks	65.00	34628	73.00	48830
2.PACS	16.33	6452	7.00	2870
3.Government Agency	0.00	0.00	0.00	0.00
Intermediaries/Informal				
4. Local Money Lenders	19.00	29524	20.00	34670

Source: Household survey data

Table - 3.9
Details of purpose of credit by the sample Households (Rs./Household)

Purposes	Purpose of credit	NFSM	Non-NFSM
		Rs. per Household	Rs. per Household
Productive uses	Agriculture	64701	87171
	Animal Husbandry	12944	7472
	Others		
	Total	77662	94643
Non-productive uses	Daily consumption		
	Social- Housing, Marriages	21573	17434
	Others -Education	8629	12453
	Total	30202	29887

Source: Household survey data

3.7 Summary of the Chapter:

400 households were selected from two sample districts of Nellore and Vizianagaram in the state. Out of 400 Households 300 NFSM beneficiary and 100 non-beneficiary Households. The ratio of members engaged in farming community reported from beneficiary and non-beneficiary Households were 46.85 and 42.95 respectively. It was found that male and female ratio 86:13 and 87:12 from NFSM and Non-NFSM beneficiary category. Above 15 years, male and female sample Households ratio reported between 37 to 39 percentages in both beneficiary and non-beneficiary Households. In respect of education status around 33 percent are illiterates and around 42 to 45 percent having primary, middle and matriculation from NFSM and Non-NFSM category family members respectively. Whereas matriculates recorded at 22 percent and 21 percent from both beneficiary and non-beneficiary families respectively and the total literacy rate found to be

66 percent from both NFSM and Non-NFSM households members. With respect to caste category both NFSM and Non-NFSM Household members found that highest members was 47.33 and 53 per cent from OBC category followed by 39 percent and 34 percent from OC category, 12.33 and 10.00 percent from SC category and 1.33 and 3 percent from ST category. The total agricultural annual income per Household was recorded at Rs.58,843 and Rs.65,793 and per Household average annual income from non-farm sources reported to be Rs.35,312 and Rs.35,740 from both NFSM and Non-NFSM farmers. Therefore from household survey annual average agriculture income revealed that more than 50 per cent of annual average of non-agricultural income per Household from beneficiary and non-beneficiary Households. The operated area covered both marginal and small farmers under NFSM and Non-NFSM category was reported at 67.79 percent and 64.93 percent and size of land holdings (84 percent) and (79 percent) were covered under marginal and small farmers in both NFSM and Non-NFSM sample farmers respectively.

The total owned land under NFSM and non-NFSM beneficiary farmers were reported at 1187.82 acres, and 421.66 acres respectively. Net operated area per Household stood at 4.33 acres and 5.21 acres in NFSM and Non-NFSM farmers. Leased in land was reported at 120.50 (0.40%) acre and 100.60 (1.01%) from beneficiary and non-beneficiary households. It was further revealed that cropping and irrigation intensity stood at 152.80 and 135.42 per cent in NFSM and 153.37 and 137.54 percent reported from Non-NFSM farms. Therefore it may conclude that the Non NFSM category per household cropping and irrigation intensity is slightly higher than that of NFSM category per Household.

NFSM beneficiaries, irrigated area by all sources reported to be 80.68 percent and the largest area irrigated by canals 26.83 percent followed by tank irrigation 25.64 percent. On the other hand total area under Non-NFSM farmers was 521.26 acres. Out of which 78.87 percent area was covered by irrigation and 21.13 per cent of area under rain fed. The highest area irrigated was at 23.68 percent by canals under non-beneficiaries. Therefore canal irrigation is the major source of irrigation under both NFSM and Non-NFSM beneficiaries. About tenancy there are two types 1) lease-in land and Lease-out land. Lease in land area under NFSM and Non-NFSM beneficiaries area were reported to be 56.40 per cent and 46.50 percent (cash) on fixed rent on land. Leasing out land area was not reported by both NFSM and Non-NFSM beneficiaries. Further the study found that among cereal crops Paddy covered 96.32 per cent and 99.12 percent under both NFSM and Non-NFSM households. Very meagre area was covered under the crops like Pulses, oilseeds, fruits and vegetables in terms of total GCA of both beneficiaries and non-beneficiaries.

Net return per Household from NFSM beneficiaries (farm business income) was at Rs.58,843 and per acre net return was at Rs.13,586. Whereas per Household total annual income from all sources stood at Rs.94,155 and non-farm income per Household was at Rs.35312. In the case of Non-NFSM average annual income per Household from farm business income was at Rs. 65,793 and non-farm income was at Rs.35,740. So the total income per Household was Rs. 1,01,533. On the other hand per acre productivity, gross return, cost of cultivation and net return of Paddy crop under NFSM beneficiaries were estimated and presented at 22.24 Qtls/acre, Rs.30,465/acre Rs.19,200/acre and Rs.11,264/acre whereas Non-NFSM farmers per acre Paddy productivity, gross return, cost of cultivation and net returns were at 22.01 Qtls/acre, Rs.29,984/acre, Rs.20,264/acre, Rs.9,720/acre respectively. Therefore NFSM beneficiaries per acre productivity, gross returns and net returns per acre reported to be higher than that of Non-NFSM farmers productivity and returns, due to the impact of implementation of NFSM and other schemes in the state.

The total value of all farm assets per Household was at Rs.47,268 under NFSM beneficiaries and at Rs.54,570 per Household in Non-NFSM category. Majority of Households availed 65 percent credit from commercial banks which was higher and outstanding loan amount was at Rs.34,628 in NFSM Households. Whereas 73 percent of Non-NFSM households availed credit from commercial banks and per Household outstanding loan amount was Rs.48,830. PACS is another important agriculture credit financial institution, through which NFSM beneficiary Households borrowed loan to the tune of 16.33 percent and the outstanding loan per Household was Rs.6,452. Whereas only 7 percent Households had taken loans from PACs and per Household outstanding loan amount under non-NFSM was at Rs.2,870. Informal credit availed 20 per cent of Households each both NFSM and Non-NFSM category. The outstanding amount per Household was at Rs.29,524 and at Rs.34,670 from beneficiary and non-beneficiary category. The maximum amount has been borrowed for the productive purposes only and the amount was Rs.77,662 and Rs.94,643 from NFSM and Non-NFSM beneficiaries per Household.

CHAPTER – IV

NFSM INTERVENTIONS AND ITS IMPACT ON FARMING

4.1. Awareness of NFSM:

In this chapter an attempt is made to analyse the NFSM scheme interventions like various farm equipment and its impact on farming. Farmer's awareness is an important factor for proper implementation of agriculture development programmes like National Food Security Mission scheme (NFSM) and Rajeev Krushi Vignan Yojana (RKVY) etc.

The state has implemented the action plan as per norms of NFSM guide lines. The state has to ensure that the inputs of HYV/hybrid rice seed varieties are used under demonstrations and seed distribution includes promotion and extension of improved technologies i.e. seed, Integrated Nutrient Management (INM) Micro Nutrient Soil amendments, Integrated Pest Management (IPM), farm mechanization along with capacity building of the farmers. At district level, the NFSM scheme will be implemented through RKVY and ATMA. The state level agency will provide the required funds to the district level agencies for execution of the programmes.

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

Details of awareness	**Percentage**
% of beneficiaries aware about the NFSM	100.00
% of beneficiaries not aware about the NFSM	--
% of beneficiaries who did not reply	--

Source: Household survey

Table 4.1(a) shows the details of awareness of NFSM scheme among sample beneficiaries and results of the primary survey was presented. The household survey was conducted from sample districts of Nellore and Vizianagaram in the state of Andhra Pradesh. All 300 beneficiary farmers (100 per cent) were aware of the NFSM programme. During the primary survey it was found that local awareness meetings and training programmes at village and mandal level were organized by the Department of Agriculture. The selection of NFSM beneficiaries and the process of implementation at district level have been executed by agricultural officers, Panchayat members at village level were also involved and discussed in the process of selection of beneficiaries according to NFSM guidelines. Beneficiary farmers expressed their opinion that 100 percent information about NFSM scheme was received from the state Agriculture Department, whereas through Krishi Vignana Kendras by 16 percent and farmers/friends by 14 percent respectively (Table 4.1 (b)).

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

Sl. No.	Sources of Awareness	% of beneficiaries aware about
1	Newspaper	0.00
2	Agriculture Department	100.00
3	State Agricultural Universities	--
4	Krishi Vignana Kendra	16.00
5	Rythu Samparka Kendra	
6	Farmers/Friends	14.00
7	Input Suppliers	--
8	Agri. Exhibitions	--
9	ZP/TP/GP	0.00
10	Others	0.00
11	Total	130.00

Note: Total % exceeds 100 due to multiple responses by some of the farmers.
Source: Household survey

4.2 Costs and Subsidy Particulars of availed NFSM benefits:

Table 4.2 presented the results of primary survey details of NFSM scheme benefits received by sample beneficiary households from 2007-08 to 2013-14. It is seen from the table that item wise costs and subsidy inputs for NFSM sample beneficiary households informed that the 65 percent. Sample beneficiaries had availed 50 percent subsidy on certified rice seed and other 35 percent sample beneficiaries received HYV seed of rice. 57 per cent of Households got micro nutrients at 50 per cent subsidy followed by pump sets (5.33 percent Households), knapsack sprayers (7.00 percent Households), plant protection chemicals (14.33 percent Households) Integrated Nutrient Management (5.33 percent Households) and other equipment (10.67 per cent Households) availed the benefits at 50 percent of subsidy under NFSM scheme. All NFSM beneficiaries attended training and awareness programmes, which were conducted by the agriculture department.

4.3 Annual Usage of Farm Equipment and their Benefits:

Table 4.3 explains the annual utilization of farm equipment under NFSM beneficiary households. It was found that pump sets/oil engines were used by sample households for 13.07 number of days and area covered by 6.87 acres per annum. Similarly, knapsack sprayers (manual and power operated) were used for 2.41 numbers of days and area covered 5.18 acres per annum under NFSM beneficiary farmers. While tarpaulins were used for 20.03 number of days covering 6.44 acres area per beneficiary households.

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 a % of total cost
1	Production of seeds- Certified seed	65.00	450	50.00
2	Seed minikits of high yielding varieties/hybrid rice	35.00	900	50.00
3	Incentive for micro nutrients (in deficit soils)	57.00	414	50.00
4	Incentive for lime in acid soils	35.00	520	50.00
5	Machineries/Tools			
6	Cono weeder			
7	Zero till seed drills			
8	Multi-crop planters			
9	Seed drills			
10	Rotavators			
11	Pump sets	5.33	8800	50.00
12	Power weeder			
13	Knap Sack Sprayers (Manual and Power Operated)	7.00	1400	50.00
14	Sprinkler			
15	Plant protection chemicals	14.33	400	50.00
16	Integrated Nutrient Management	5.33	572	50.00
17	Integrated Pest Management	5.33	152	50.00
18	Training	100.00	N.A	100.00
19	Others	10.67	1289	50.00
	Total	31.63	1866	55.56

Source: Household survey

It was observed during the field survey that the NFSM beneficiaries derived different types of benefits by using various equipment's being distributed under NFSM scheme. Table 4.4 indicated that by using farm equipment under NFSM scheme 84.60 per cent and 45.00 per cent of beneficiary Households positively responded for the supply of pump sets and sprayers, which were helped them in timely agricultural operations and dry land agriculture under Paddy crop. Further 35 per cent of Households and 25.00 percent of Households reported positively for good plant growth due to supply of plant protections chemicals INM and IPM besides incentives for micro nutrients trainings and other awareness programmes.

Table - 4.3
Annual usage of farm equipment 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/oil engine	13.07	6.87	2435	1625
2	Knap sprayers	2.41	5.18	881.82	1490
3	Tarpaulin	20.03	6.44	894	970
	Total	12.78	6.37	1206	1593

*Use one manday=8 hrs for estimating No. of days used per implement per annum
Source: field survey data

Table - 4.4
Benefits derived from farm equipment's (% of benefitted HH)

Sl. No.	Benefit derived/Name of the implement	Pump sets	Sprayers
1	Solved labour shortage	34.00	20.00
2	Timely operations	84.60	45.00
3	Saved water	0.00	0.00
4	Weed control	0.00	0.00
5	Good plant growth	35.00	25.20
6	Reduced drudgery	0.00	0.00
7	Helped in transportation	0.00	0.00
8	Reduced cost of cultivation	0.00	12.30
9	Increased cropping intensity	88.10	62.50
10	Reduced post-harvest losses	0.00	0.00

Source: field survey data

Table 4.5 discusses the benefits obtained under NFSM scheme. The benefits availed under NFSM scheme such as farm inputs like Hybrid seed/HYV seed micro nutrients, incentives for lime in acid soils, pump sets, knap sack sprayers, sprinklers, plant protection chemicals, INM, IPM, trainings and etc. By availing all the inputs being provided by the government under NFSM scheme, the beneficiary farmers were able to derive high rice production. The study also estimated the impact of benefits availed under NFSM scheme on productivity, reduction of material cost, fall in water use, fall in labour cost, fall in production losses after intervention. Besides improvement of better quality production, improvement of soil health and improvement in human health details are presented in Table 4.5.

Table - 4.5
Impact of the benefit availed under NFSM

Sl. No.	Benefit derived/ Name of the implement	Impact	Certified Seed	Pump sets	Knap sack sprayers	Spra-yers	Micro nutrients	INM	IPM	Training	Other benefit
1	% increase in productivity	No change	2.33	9.52	0.00	37.50	41.72	0.00	44.90	0.00	56.25
		1 to 10%	53.33	88.10	95.92	62.50	58.28	73.33	55.10	100.00	43.75
		10 to 15%	35.33	4.76	4.08	0.00	0.00	26.67	0.00	0.00	0.00
		> 15%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	% fall in material cost	No change	24.00	100.00	100.00	100.0	31.29	0.00	48.39	88.10	100.00
		1 to 10%	57.06	0.00	0.00	0.00	68.71	66.67	52.61	11.90	0.00
		10 to 15%	18.94	0.00	0.00	0.00	0.00	33.33	0.00	0.00	0.00
		> 15%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	% fall in water use	No change	100.00	87.62	100.00	73.33	100.00	100.00	100.00	100.00	100.00
		1 to 10%	0.00	12.38	0.00	26.67	0.00	0.00	0.00	0.00	0.00
		10 to 15%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		> 15%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	% fall in labour cost	No change	100.00	100.00	88.39	87.62	100.00	100.00	73.33	66.67	41.94
		1 to 10%	0.00	0.00	11.62	12.38	0.00	0.00	26.67	33.33	58.36
		10 to 15%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		> 15%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	% reduction in losses after interventio	No change	58.09	100.00	100.00	100.0	26.67	48.39	88.10	44.90	100.00
		1 to 10%	41.91	0.00	0.00	0.00	73.33	51.61	11.90	55.10	73.33
		10 to 15%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		> 15%	0.00	0.00	19.05	0.00	0.00	6.67	0.00	21.58	41.94
6	% increase in price of the output because of better quality	No change	69.37	100.00	100.00	100.0	100.00	100.00	100.00	100.00	100.00
		1 to 10%	30.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		10 to 15%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		> 15%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	Improvement in soil health (% of HHs who have mentioned "yes")	No change	100.00	100.00	100.00	100.0	45.16	48.39	100.00	73.33	73.33
		1 to 10%	0.00	0.00	0.00	0.00	54.84	51.61	0.00	26.67	26.67
		10 to 15%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	0.00
		> 15%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	Improvement in human health (% of HHs who have mentioned	No change	97.62	100.00	100.00	100.0	100.00	100.00	100.00	100.00	100.00
		1 to 10%	2.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		10 to 15%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		> 15%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.81	0.00

Source: Household survey

Table 4.5 reveals that the intervention of NFSM scheme of the NFSM beneficiaries expressed the impact of each input or implement to percentage of benefits derived under Paddy crop. More than 50 percent farmers have expressed their opinion that the productivity of rice crop was increased by 10 percent under NFSM scheme and 53.33 percent of NFSM farmers reported that the productivity was increased by the supply of HYV/hybrid seeds including other farm implements like pump sets (88.10 percent), knap sack sprayers (95.9 percent), sprayers (62.50 percent), micro nutrients (58.28 per cent) INM and IPM 73.33 per cent and 55.10 percent of NFSM Households reported. More over 100 per cent of NFSM Households informed training programmes are benefitted for the improvement of rice productivity. In the case of fall in material cost upto 10 percent positively responded by 57 percent of beneficiaries for the supply of inputs like Hybrid/HYV seeds, followed by micro nutrients, INM and IPM are also influenced to reduce the material cost expressed by more than 60 percent of NFSM Households in the course of field survey.

Out of 300 NFSM beneficiaries, very few beneficiaries expressed positively regarding the impact of NFSM scheme benefits about the fall in water use and fall in labour cost. While the production losses reduced upto 10 percent opinion expressed by 73.33 percent for utilization of micro nutrients, INM 51.61 per cent, trainings 55.10 percent and HYV/Hybrid Rice seed supply 41.9 percent of HH expressed positively to fall in losses slightly under NFSM scheme. In the case of improvement in soil health increased upto 10 percent expressed positively by 54.84 percent and 51.61 percent of Households for utilization of micro nutrients and INM. Majority of the beneficiary farmers opined that there was no change or no impact was occurred in the case of increase in the price or better quality of output under NFSM scheme. None of the beneficiary farmer opined that there was no change or no impact in increasing human health from NFSM scheme under Rice crop.

Therefore the above interpretation indicates that there was some positive impact of NFSM scheme interventions on Rice crop production under NFSM scheme. So in the long run the impact of NFSM scheme was seen in the increase of rice productivity in addition to this scarcity of labour problem is reduced as a result of which the cost of cultivation decreases and enhancement of farm income. Further the table indicated that majority of beneficiaries opined that the pump sets, sprayers are helped in timely operations. In addition to some sample households responded that the supply of inputs like HYV/hybrid seed, nutrients and INM and IPM are helped to fall in material cost of the beneficiaries.

Table - 4.6
Per acre cost and return of paddy in Kharif 2013-14

Particulars	Unit	NFSM		Non-NFSM	
		Quantity	Value (Rs.)	Quantity	Value (Rs.)
Hired Labour	Man days	31.34	6936	27.66	6262
Family Labour	Man days	8.89	2200	10.65	1600
Bullocks	Pair/day		1100		1000
Tractor/Tiller	Hours	3	2400	3	2465
Seed	Kgs	26.78	450	37.4	950
FYM/Organic/ Bio-fertilizers	Tonnes	1	900	1	1200
Fertilizers	Kgs	110	1471	127	2600
Pesticides	Kg/lit	0.47	379	0.80	622
Irrigation charges	Rs.				
Harvesting & Threshing	Rs.	1	2714	1	2845
Bagging, Transportation & marketing cost	Rs.		650		720
Total cost	Rs.		19200		20264
Main product	Kgs	22.24	28557	22.01	28292
By-product	Kgs	2000	850		620
Gross Income	Rs.		29407		28912
Net Income	Rs.		10207		8648
Cost per quintal	Rs.		863		921

Source: Household survey

4.4 Per Acre Cost and Return of Paddy in Kharif and Rabi/Summer – 2013-14:

The study discussed per acre cost and returns of Paddy crop cultivated in Kharif season by both the NFSM beneficiary and non-beneficiary farmers to know the difference between costs and returns of various inputs during the reference year. The cost of cultivation estimated under paddy crop grown by the sample Households is one of the vital factor for determining the economic feasibility of cultivation. Unless the crop gives good returns to the farmer, he cannot be continued to the next agriculture year. Moreover farmer can use various inputs in production of different crops. Inputs are more instrumental for better agricultural productivity.

An attempt has been made to estimate the cost of cultivation for kharif paddy crop grown by the sample farmers. Households survey was conducted 300 Households from NFSM beneficiaries and 100 Households from Non-NFSM beneficiaries during the agriculture year (2013-14). The total production cost of paddy crop was covered by both paid out cost

and imputed costs. The paid out costs constituting hired human labour, input costs such as seed, fertilizer, pesticides, farm yard manure bullock/machine labour and other expenses. The imputed costs include home produced organic manure like cow dug and family labour etc.

Table 4.6 presented the cost and returns of Kharif season paddy crop per acre during (2013-14) on NFSM and Non-NFSM sample farmers. The table shows that per acre total input costs under NFSM beneficiaries were found to be Rs.19,200 as against Rs.20,264 per acre on Non-NFSM beneficiaries. Thus, the cost per acre was slightly higher on non-NFSM farms in compared to NFSM farms. Maximum costs were incurred on hired labour and costs of harvesting and threshing besides by tractor/triller, fertilizer and pesticides. While for non-NFSM beneficiaries per acre cost incurred on hired labour and family labour followed by tractor/triller, FYM/organic/bio fertilizers, fertilizers, seed, bullocks, pesticides, harvesting and threshing and transportation. Total paddy per acre cost, was higher 20,264 under non-NFSM farms than NFSM farms was Rs.19,200. Whereas per acre net income was higher on NFSM beneficiary (Rs.10,207) than Non-NFSM beneficiary (Rs.8,618).

Table 4.7 explains about the per acre cost and returns of paddy crop (rabi season) for NFSM and Non-NFSM sample farmers. The table depicted various input costs. Among input costs hired labour and family labour costs are maximum followed by other inputs like tractor/trillar harvesting and threshing, use of fertilizers, bio-fertilizers seed, transportation and pesticide costs for both NFSM and Non-NFSM sample farmers. Per acre total cost of various inputs were reported higher in non-NFSM farms compared to NFSM farms. Whereas per acre gross income and net income were found to be higher in NFSM farms when compared to Non-NFSM sample Households. NFSM paddy farmers received various benefits of farm inputs and equipment supplied at subsidized price from the agricultural department under NFSM schemes. Therefore NFSM farmers per acre paddy crop costs are lower than Non-NFSM farmers. The estimations of paddy crop per acre gross income and net income under NFSM beneficiary were also found to be higher than Non-NFSM farmers. Therefore it may conclude that impact of NFSM scheme directly benefitted to the beneficiaries under Rice crop. So the supply of inputs under NFSM scheme reduced the material costs and increased the productivity as well under rice crop of the NFSM beneficiaries.

Table - 4.7
Per acre cost and return of paddy in Rabi/Summer 2013-14

Particulars	Unit	NFSM		Non-NFSM	
		Quantity	Value (Rs.)	Quantity	Value (Rs.)
Hired Labour	Mandays	30.26	7397	28.21	7055
Family Labour	Mandays	8.33	2126	5.97	1560
Bullocks	Pair/day				
Tractor/Tiller	Hours	3	1900	3	2158
Seed	Kgs	26.77	992	35.2	1300
FYM/Organic/ Bio-fertilizers	Tonnes	1	1200	1	1400
Fertilizers	Kgs	110	1701	127	1990
Pesticides	Kg/lit	0.47	413	0.84	659
Irrigation charges	Rs.				
Harvesting & Threshing	Rs.	1	1565	1	1585
Bagging, Transportation & marketing	Rs.		540		500
Total cost	Rs.		17854		18307
Main product	Kgs	26.72	34317	25.5	32597
By-product	Kgs	2000	1256		1692
Gross Income	Rs.		35573		34289
Net Income	Rs.		17719		15982
Cost per quintal	Rs.		713		804

Source: field survey data

The Table 4.8 clearly explains about the details of marketing channels and marketed surplus of paddy production. It is evident from the table that 34.60 percent beneficiary households and 29.60 percent non-beneficiary households had sold their output at local market. Whereas 32.30 percent and 22.30 percent of households from beneficiary and non-beneficiary farmers sold the paddy production for merchants moreover 15.60 percent and 17.40 percent of households from beneficiary and non-beneficiary sold the Paddy produce to intermediaries. All the above mentioned three channels are private. Whereas the government procurement was limited, only to 17.60 and 30.70 percent of Paddy production sold to the government by the NFSM and Non-NFSM beneficiary households reported in the house hold survey (2013-14).

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	34.60	33.45	29.60	28.40
3	Merchant	32.20	31.26	22.30	22.60
4	Co-operative				
5	Government	17.60	19.68	30.70	31.80
6	Intermediaries	15.60	15.61	17.40	17.20
7	Private company	--	--	--	--
8	Mills	--	--	--	--
9	Others	--	--	--	--

Source: Household survey data

Therefore the above analysis indicated that a majority of households sold their paddy produce to the private agencies. Only 17.60 and 30.70 per cent of production sold to the government agency by both beneficiary and non-beneficiaries. There was no permanent marketing channel for agricultural produce like paddy which was being bought by FCI, a Government of India enterprise. Majority of farmers depend on private traders for selling their surplus produce of Rice. While the majority of farmers borrowed loans from private traders. So these farmers sold their produce to the private traders.

4.5 Summary of the Chapter:

In the course of primary survey, it was found that 100 percent sample farmers got NFSM guide lines through awareness programmes and trainings which were organized at village and mandal level by the Department of Agriculture, Government of Andhra Pradesh. Apart from the department of agriculture beneficiary farmers received information from Krishi Vignana Kendra and farmers/friends as well. It was found that 100 percent of Households received 50 percent subsidy from HYV/Hybrid rice seed and other inputs. Micro nutrients received in 57 percent of Households, followed by other incentives like lime acid soils 35 percent Households plant protection chemicals 14.33 Households, knap scak sprayers 7.00 percent Households and 5.33 percent Households got 50 percent subsidy benefit from pump sets and INM and IPM under NFSM scheme. It was found that per household average total benefit availed from various components under NFSM paddy crop

was Rs.1,866. The annual usage of farm equipment like pump sets were used 13.07 days covering 6.87 acres per beneficiary household and knap sack sprayers (manual and power operated) were used 2.41 days and benefited per beneficiary household was 5.18 acres.

During field survey, it was observed that the NFSM beneficiaries obtained various benefits by utilizing various farm equipment's being provided by the NFSM scheme. Among all equipment's supplied by the NFSM scheme reported individually like sprayers and pump sets supported 84.60 percent and 45 per cent beneficiary households has performed their agricultural activity on time. Majority of beneficiary households expressed that the NFSM farm equipment would be useful slightly to increase the productivity under rice crop. Moreover pump sets and sprayers also provide benefit for good plant growth responded by 35.00 percent and 25 percent of beneficiary households respectively. The intervention of NFSM scheme like supplied subsidy inputs of HYV/Hybrid seed, INM, IPM, Micro nutrients and other farm equipment also provide the benefit upto 10 percent increase the paddy productivity responded by NFSM beneficiary farmers.

Per acre cost and return of paddy cultivation under NFSM beneficiary and non-beneficiary farmer was estimated for better comparison during the reference year. It was found that in Kharif season per acre paddy total cost of cultivation was 19,202 and 20,264 in both NFSM and non-beneficiary farmer. Among all input costs hired labour cost was higher in both NFSM and Non-NFSM beneficiaries and total cost per quintal Paddy production was found to be Rs.863 and Rs.921 both NFSM and non-NFSM sample farmers. On the other hand paddy crop in Rabi season the cost of cultivation per quintal found to be Rs.713 in NFSM beneficiary and Rs.804 for non-beneficiary farmer. The cost of cultivation per acre cost per quintal paddy produce found to be higher in kharif than rabi produce, whereas net income per acre under rabi season paddy crop found to be more than the kharif paddy crop.

In the course of field survey the study found that the marketing channels and marketed surplus of paddy output revealed that 82.40 per cent and 69.30 percent of households sold to private channels such as local market, merchants and intermediaries by both NFSM and non-NFSM beneficiaries. Whereas the marketed surplus output value found to be more 81.32 percent and 68.20 percent sold to private markets by NFSM and Non-NFSM beneficiaries. So the procurement of Paddy produce is limited by the State Government agencies reported by the sample farmers during the field survey.

CHAPTER – V

PARTICIPATION DECISION CONSTRAINTS AND SUGGESTIONS FOR IMPROVEMENT OF NFSM

INTRODUCTION:

This chapter revealed the important factors influencing the sample farmers under NFSM scheme, constrains being faced in availing NFSM benefits, suggestions for improvement of beneficiary and non-beneficiary farmers under NFSM scheme. The reasons for non-participation in the NFSM and also suggestions for inclusion of non-beneficiary for availing benefits under NFSM.

5.1 Factors influencing Participation of Farmers in NFSM:

Logistic Regression:

Regression analysis was used to conduct when the dependent variable is dichotomous (binary) like all regression analysis, the logistic regression is a predictive analysis, logistic regression is used to describe data and to explain the relationship between one dependent binary variable and one or more metric (interval and ratio scale) independent variables.

The likelihood ratio test statistics was estimated in the fitted logit regression equation/formula has been used to analyse the factors influencing the participation of farmers in NFSM. Table 5.1 shown the independent variables such as age in years, education dummy 1 assumes the value of 1, if the level of education of the farmer is upto primary /till secondary else 0, similarly education dummy 2 assumes the value of 1, if the level of the education of the farmer higher secondary, else 0. Education dummy 3 assumes the value of education of the farmer degree/diploma, else 0. Operational holdings in acres, family size, in the case castes, similar dummy variables have been introduced. In particular, the caste dummy 1 assumes the value 1, if the respondent farmer belongs to the SC/ST category caste dummy 2 assumes the value 1, if the respondent farmer belongs to OBC category, the caste dummy 3 assumes the value of 1, if the respondent farmer belongs to OC category, farm income, ratio of NIA to NSA, credit availed per acre and farm asset value have been considered as an independent variables to analyse the participation in NFSM (Y). All 400 respondents were participated in NFSM scheme in the study area and considered that as independent variables.

Out of the twelve independent variables, five independent variables are turned out to be statistically significant at one percent probability level. The livelihood ratio test statistics was estimated to be 110 in the fitted logistic regression equation which reveals that 100 out

of 400 respondents were likely to participate in NFSM in the study area with respect to select independent variables being taken into consideration.

The co-efficient of independent variables like operational holdings, family size, income from farming, credit availed (per acre) and farm asset value (Rs.) are turned out to be statistically significant at 1% probability level. The odds ratio of operational holding indicates that one percent change in operational landholding leads to there may be 41.1 percent likely to decrease of participation of respondents in NFSM.

The odds ratio of Family size (X_4) indicates that a one person increase in family size leads to there may be 2.2 times likely to participate in NFSM and Vice-versa.

Table - 5.1
Factors influencing participation in NSFM (Dependent variable: 1 for NFSM beneficiaries: otherwise)

Logit estimates Dependent Variable: Benefit Dummy			**Number of**	**400**	
			Lrchi2(12)	**215.32**	
			Prob>chi2	**0.0000**	
			Pseudo R2	**0.4847**	
			Log likelihood	**-114.4461**	
Independent Variables	Coefficient	Std. Err.	Z	P>|z|	Odd ratio
Age (in Years)	0.0130099	0.0154024	0.84	0.398	1.013095
Education dummy 1	0.2622077	0.4291348	0.61	0.541	1.299796
Education dummy 2	-0.2514553	0.7194068	-0.35	0.727	0.7776682
Education dummy 3	-0.5512641	0.6526759	-0.84	0.398	0.5762209
Operational Holdings	-0.8962934*	0.1329258	-6.74	0.000	0.4080795
Family Size	0.7845494*	0.2520337	3.11	0.002	2.191419
Caste dummy 1	0.2229309	0.5636774	0.40	0.692	1.249734
Caste dummy 2	0.635368	0.4246078	1.50	0.135	1.887717
Caste dummy 3					
Income from farming	0.000052*	0.0000664	7.83	0.000	1.000052
Ratio of Irrigated to total operational Area	-1.362314	2.004777	-0.68	0.497	0.2560676
Credit availed (per	0.0000227*	0.0000806	2.81	0.005	1.000023
Farm asset value (Rs.)	-0.000012*	0.0000258	-4.66	0.000	0.999988
Constant	-1.273382	2.299977	0.55	0.580	--

* Significance at 1% Level, ** Significance at 5% Level, *** Significance at 10% Level,
Source: Field Survey
Note: Use logistic Regression by taking relevant independent variables and try to get a better fit model.

With regard to odds ratio of farm income (X_7) indicates that one percent change in farm income leads to there may be cent percent likely to participate in NFSM. With regard to odds ratio of Farm Asset Value (X_{10}) indicates that a one percent change in the value of farm asset leads to there may be 99 percent likely to participate in NFSM.

The important variable credit availed per acre (X_9) is also tuned out to be statistically significant at 5% probability level, the odds ratio of this variable indicates that a one percent change in credit availed per acre leads to there may be 1.1 percent likely to participate in NFSM. The coefficient of variable caste OBC (X_6) is also statistically significant at 10% probability level. The odds ratio indicates that the respondent belongs to OBC leads to there may be 2.04 times likely to participate in NFSM.

5.2 Constrains faced in availing the NFSM benefits (only beneficiary):

Table 5.2 presented the constraints being faced by beneficiary farmer in availing benefits under NFSM scheme. It is seen that the total NFSM beneficiaries under rice crop has answered "YES" for getting information about NFSM scheme through training programmes. 100 percent of beneficiary farmers reported that the eligibility criteria for availing subsidy was provided to the households and the procedure for availing input subsidy was quite easy. These were not at all a problem for them. Whereas a few 11.67 percent of households expressed against only few documents required for availing the subsidy. Further out of 300 beneficiary farmers, 34.67 percent of beneficiary HH expressed that the initial payment is the biggest problem. It is because of this problem the subsidy that is being given to them getting delayed. All the respondents expressed that the availability of financing facility is a major constraint due to non-availability of institutional financing facility under NFSM scheme. 43 percent of beneficiaries expressed negatively for obtaining technical knowledge and it was one of the major constraints under NFSM scheme. 36.00 percent of beneficiaries reported that there was long time gap between the purchase and receiving the subsidy amount. It is said that 8.16 percent of beneficiaries viewed that there is a political interference in the selection of beneficiaries and sanction of farm equipment like mini tractors and pump sets. No farmer expressed his opinion of no poor quality material/machinery being supplied under NFSM scheme.

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

% of beneficiaries faced problems while availing the scheme			
Sl. No	**Constraints**	**Yes**	**Remarks**
1	Information about NFSM reaches comprehensively to	0.00	
2	Eligibility or criteria for availing the subsidy is	0.00	
3	Procedure for the subsidy quite easy (if no provide	0.00	
4	Only few documents are required for availing the	11.67	
5	Subsidy paid after purchase while initial payment	34.67	
6	Institutional financing facility available under the	74.00	
7	Capacity building/technical advice is provided under	43.00	
8	Long-time gap between the purchase and receiving the	36.00	
9	Biased towards large land owners	8.16	
10	Poor quality of materials/machinery are supplied	0.00	
11	Others	N.A	

Source: Household survey data

5.3 Suggestions for Improvement of the NFSM Scheme:

Table 5.3 presented the suggestions made by the NFSM beneficiary farmers for improvement of the NFSM scheme. In the course of field survey 41.67 percent of beneficiary farmers had suggested to improve timely distribution of inputs like fertilizers, seeds, pesticides and chemicals. Whereas 26.67 percentage of beneficiary farmers were of the opinion that more subsidy should be given to the farm equipment under the scheme. These two inputs would reduce the cost of cultivation and reduce the problem of scarcity of agriculture labour. 11 percent of beneficiary households had suggested for improvement of irrigation facility or support through sanction of bore well under the scheme. Whereas about 25 percent beneficiary households expressed that Minimum Support Price (MSP) should be increased by the government. 11.67 percent and 16 percent of beneficiaries informed that marketing facilities should be expanded and incorporate the institutional finance under the scheme. Under NFSM scheme Apart from all 18.67 percent beneficiaries suggested to extend compulsory crop insurance for agriculture. So these are the suggestions given by the NFSM farmers for the effective implementations of the NFSM scheme.

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

Sl. No.	Suggestions	% of the beneficiary Farmers
1	Timely distribution of Subsidy inputs	41.67
2	Extended the farm mechanisation subsidy	26.67
3	Digging bore wells on subsidy basis (irrigation support)	11.00
4	Enhancement of Minimum support price	25.00
5	Extended the marketing facilities	11.67
6	Enhancement of institutional finance	16.67
7	Compulsory Crop insurance	18.67

Source: Household survey data

Table 5.4 presented the suggestions for improvement of the NFSM scheme by non-beneficiary farmers. The table reveals that the majority of non-beneficiaries (35 percent) reported that the coverage of crop insurance is needful to reducing farmer's suicides. So it is a mandatory to include under NFSM scheme. 28.50 percent of non-beneficiaries suggested that the need full farmer should include the NFSM beneficiary list, irrespective of community and political interference. 26.25 percent of non-beneficiary farmers advised that extend the soil testing practices to all farmers at the village. 14.50 percent of non-beneficiary expressed the extension of awareness and technical advice such as about suggestions for requirements of inputs and use of proper doses of fertilizer, pesticides and chemicals. Further 21.00 percent of beneficiary farmers emphasized upon extension of marketing facilities at village level.

Table - 5.4
Suggestions for improvement of the NFSM scheme (Non-Beneficiary)

Sl. No.	Suggestions	% of the non-beneficiary farmers
1	Need for farmers should considered under NFSM scheme	28.50
2	Soil testing is needed	26.25
3	Awareness about usage of Fertilizers and Micro nutrients	14.50
4	Extend Marketing facilities	21.00
5	Coverage of crop and farmer insurance in the light of suicide farmers families across the state	35.00

Source: Household survey data

5.4 Reasons for Non-participation in the NFSM:

Table 5.5 indicated the reasons for non-participation in the NFSM scheme. In the course of field survey, non-beneficiaries were asked by the field investigators about the reasons for non-participation in NFSM scheme. Out of 100 non-beneficiaries majority of non-

beneficiaries (65 percent) replied that the main reason was lack of knowledge about the NFSM scheme and also participated in other schemes like ATMA, RKVY etc. 18 percent of non-beneficiaries expressed that the selection of beneficiaries are politically driven and the selection procedure was made by the ruling political party. 28 percent of non-beneficiaries replied that the scheme provides in adequate supply of inputs and not in time supply as well. Moreover supply of input under the NFSM scheme is not enough to meet his actual requirements under total paddy crop area besides farm technical equipment being supplied to limited beneficiaries by NFSM scheme. The above reasons were cited for not including beneficiaries under the scheme.

Table - 5.5
Reasons for non-participation in the NFSM (Only Non--beneficiary)

Sl. No.	Suggestions	% of the non-beneficiaries
1	Lack of knowledge about NFSM scheme	65.00
2	Inadequate supply o inputs	28.00
3	Selection made by relating political party	18.00
4	Some Non-beneficiaries are covered by other	28.33

Source: Household survey data

5.5 Suggestions for the inclusion of non-beneficiary for availing benefits under NFSM:

The non-beneficiary farmers made some major suggestions for inclusion under NFSM scheme presented in Table 5.6. Majority of non-beneficiary farmer (70 percent) opined that the governments should extend more importance on awareness campaigns as many non-beneficiary farmers did not know about the NFSM scheme and it benefits. 35 percent of non-beneficiary farmers opined that free supply of inputs are need to marginal and small farmers under NFSM scheme. 42 percent of non-beneficiary farmers suggested that strengthening of agriculture extension services. In rural areas majority of farmers are not aware about the adoption of new farm technology. Therefore, extend the training programmes to create awareness and demonstrations on new farm technology at field level under the NFSM scheme. All these programmes disseminate to all the farmers at village level. Finally 25 percent of non-beneficiary HH expressed that remove the political interference at the time of selection for the selection of beneficiaries for any government schemes like NFSM.

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

Sl. No.	Suggestions	% of the non-beneficiaries
1	Extended the awareness programmes	70.00
2	Free supply of inputs	35.00
3	Strengthen the Agriculture extension services	42.00
4	Restrict political interference for selection of	25.00

Source: Household survey data

5.6 Summary of the Chapter:

The logistic regression equation was applied to identify the factors influencing the participation of NFSM beneficiary farmers. From the above analysis reveals that the independent variables like operational holdings (acres), family size, income from farming and credit availed (per acre) and farm asset value (in Rs.) are statistically significant at 1 percent probability level, and other variables age (in years), education dummy 1, education dummy 2, education dummy 3, caste dummy 1, caste dummy 2, caste dummy 3, ratio of irrigated to total operated area are turned out to be not statistically significant even at 10 percent probability level and the education dummy 3 is omitted by STATA package due to co-linearity problem.

All selected NFSM beneficiary farmers have received the details of NFSM scheme and its benefits like eligibility criteria for availing subsidy and details of availing input subsidy. The study found that three major constraints were expressed by majority of beneficiaries viz., 1) capacity building/technical advice is poor expressed by 43 percent of beneficiaries 2) wide gap between the purchase of inputs and receiving input subsidy amount and 3) initial payment for purchasing subsidy inputs are also major constrains under NFSM scheme. Some beneficiaries were of the opinion that there should be political interference in the selection of beneficiaries under the scheme. Institutional finance credit facility should be incorporated in the NFSM scheme.

NFSM beneficiaries made some suggestions for improvement of the scheme: 42 percent of beneficiaries had suggested improving timely distribution of inputs, 27 percent of beneficiaries expressed that to extend the farm machinery subsidy and distribution of farm machinery to more beneficiary farmers and 25 percent beneficiaries reported that enhancement of minimum support price under rice produce through NFSM scheme. Irrigation support through digging bore wells on subsidy basis (11 percent), extension of marketing

facilities (11.67 percent) compulsory crop insurance (18.67 percent) are the major suggestions expressed by NFSM beneficiaries for improvement of NFSM scheme under rice crop in the course of field survey.

Out of 100 non-beneficiaries majority (35 percent) non-beneficiary farmers expressed that there should be crop and farmer insurance so as to as to reduce farmer suicides. Some of the non-beneficiaries suggested that the soil testing practices, extension of marketing facilities and awareness programmes are required. The non-beneficiaries expressed that some of farmers were also participating in some agricultural schemes, inadequate supply of inputs and biased selection of beneficiaries.

Non- NFSM beneficiary farmers are also made some suggestions to improvement of NFSM scheme out of 100 non-beneficiary farmers majority 70 per cent of non-beneficiary farmers opined that the extend more awareness programmes about the benefits of NFSM scheme through training programmes and field survey etc. followed by strengthening and extend the agricultural extension services suggested by 42 percent, free supply of inputs are needful to marginal and small farmers by 35 percent farmers and ignore the political interference at the time of selection of beneficiary and allotment of farm mechanization suggested by non-beneficiary farmers.

CHAPTER – VI

CONCLUDING REMARKS AND POLICY SUGGESTIONS

Ministry of Agriculture, Government of India, had launched a prestigious scheme called the National Food Security Mission (NFSM) in the year 2007. It is a central scheme implemented for five years to increase production and productivity of rice, wheat and pulses on a sustainable basis.

The farming community retains its confidence in farming activity. With these strategies and goals, NFSM scheme was implemented in 561 districts in 27 states in the country. There were several other state and centrally sponsored schemes were also being implemented along with NFSM programme, with the efforts of both central and state government, rice production was increased by 121 million tonnes by the end of the 11th Five year Plan. Wheat production by 19.1 million tonnes and pulse production by 3 million tonnes as compared the production during the base year 2006-07. The Mission is being continued during 12 FYP (2012-17) with new targets of additional food grain production. In the 12th FYP, NFSM aims at raising grain production by 25 million tonnes, includes 10 Million tonnes of rice, 8 million tonnes of wheat, 4 million tonnes of pulses and 3 million tonnes of coarse cereals and fodder.

6.1 Role of NFSM in Andhra Pradesh:

National Food Security Mission (NFSM) was launched during 2007-08 covering 11 districts under rice crop in the state. The objective of the scheme was to increase the production of rice by increasing in area and productivity. The area under rice crop was increased from 2105.47 thousand hectares to 2475.09 thousand hectares during 2007-08 to 2010-11. Further the rice crop grown area has declined to 2079.69 and 1798.29 lakh hectares in the year 2011-12 and 2012-13 of selected NFSM districts in the state due to transformation of area from food grain crops to commercial crops and horticultural crops despite low level of rainfall and power crisis in the state. In the case of pulse crops, the NFSM scheme covered 14 districts in the state during 2007-08 and 2008-09. In the year 2009-10 the scheme was implemented in 22 districts and it covered 1932.00 and 2074.00 thousand hectares in the year 2009-2010 and 2011. The pulse crops are usually cultivated under dry lands and mostly depend on rainfed in the state.

6.2 Methodology:

The present study was conducted in the state of Andhra Pradesh impact of National Food Security Mission (NFSM). For the selection of beneficiary and non-beneficiary of NFSM (rice) a multi-stage sampling design method was used (Flow chart – 1) The study covers two NFSM (Rice) districts viz. Nellore and Vizianagaram of Andhra Pradesh state. Among the districts Nellore is highest and Vizianagaram is the lowest rice production for the study. From each sample district two mandals were selected, at the second stage, one mandal is selected from nearby district headquarters and another was selected at a distance of 15 to 20 kilo meters from the district headquarters, at the third stage 75 beneficiaries (NFSM-Rice) and 25 non-beneficiaries were selected purposefully from each mandal totalling to a sample size of 200 households in each NFSM district. Altogether 400 households were selected for the study (300 beneficiary and100 non-beneficiaries). For the selection of beneficiary households in each mandal, the beneficiary lists were collected from the mandal agriculture offices. After obtaining the beneficiary list, sample households were selected who have obtained benefits of various components under NFSM programme being launched for the year in 2013-14.

6.3 Findings from Secondary Data:

Accordingly based on secondary data, the results are analysed below regarding area, production and productivity of Rice and pulse crops during 9th, 10th and 11th Five Year Plans in the state and district level.

1. The state net sown area was increased from 97.29 lakh hectares during 2002-03 to 112.88 lakh hectares during 2010-11 and the trend in area average AGR was also found to be positive at 1.69. 4.14 and 0.97 percent respectively during the 9th, 10th and 11th FYP Plan periods. The percentage of NIA to NSA average AGR was also reported positive trend 0.36, 0.49 and 1.67 percent during the above plan periods respectively. In the case of Irrigation intensity average AGR was reported 0.05 percent in 9th plan to 2.26 percent in 10th FYP. Whereas in 11th FYP it was declined by -0.29 percent. With respect to cropping intensity average AGR was reported highest 0.57 percent in 10th FYP and the use of fertilizer consumption growth rate per hectare found to be highest 8.47 percent in 10th FYP compared to 9th and 11th plan periods in the state.

The study found that among three five year plan periods the average AGR under Rice crop found to be positive and reported higher growth rate during 9th and 10th FYP comparatively 11th FYP in the state. In the case of Wheat crop cultivable area reported very meagre comparatively rice crop and this average AGR of area, production and

productivity reported highest in 11th Five Year Plan period. In the case of pulse crop average AGR of area production and productivity was highest 5.40, 24.18 and 18.13 percent during the 9th plan comparatively other two FYP (10th and 11th Five Year Plans) in the state.

With regard to NFSM districts during 9th and 10th Five Year Plan periods under Paddy crop average AGR recorded significant growth, whereas in 11th plan area only reported significant growth but the growth rate of production and productivity reported negative growth. The non-NFSM districts area, production and productivity of paddy crop have recorded significant growth during 9th,10th and 11th Five Year Plan periods except yield growth only reported negative trend during the 11th plan period. Overall 22 districts the yield growth rate reported negative in 10th and 11th FYP in the state. In the case of wheat crop growth area reported very meagre and very few districts are covered in the state. While in the case of pulse crop during the 9th FYP area, production and productivity average AGR recorded positively significant trend whereas in 10th and 11th FYP average AGR has negatively recorded.

The state financial progress under NFSM districts have been increased year after year and the 11th FYP average AGR of the released amount and was 40.43 and 70.82 percent during 11th FYP. Whereas in the 12th FYP released and expenditure amount was also increased in the years 2012-13 and 2013-14.

The study has also addressed component wise financial outlays, expenditure and its percentage of expenditure during the 11th plan period under NFSM scheme. Among category wise interventions highest funds were allocated and spent on seed distribution.

Lastly, the correlation co-efficient between percentage change of total NFSM expenditure to percentage change in irrigated area and use of fertilizer consumption indicated that no significant impact was revealed between the variables. Whereas the correlation coefficient between percentages change in NFSM expenditure to the change in area and production was also reported negative impact from paddy, wheat and pulse crops in the state. Due to unfavourable climatic conditions and natural calamities and declared crop holiday to the tune of 90 thousand hectares covering paddy crop from part of Godavari districts in the state.

6.4 Findings from Field Survey Data: Major Findings:

400 households were surveyed from two sample districts of Nellore and Vizianagaram. Out of 400 HH, 300 NFSM beneficiaries and 100 non-beneficiaries HH were

selected. Percentage of members engaged in farming reported from beneficiary and non-beneficiary Households were at 46.85 and 42.95 respectively. It was found that male and female ratio reported to be 86:13 and 87:12 from NFSM and Non-NFSM beneficiary category. Above 15 years age male and female ratio was reported between 37 to 39 percentages in both beneficiary and non-beneficiary Households. With respect to education status illiterates were around 33 percent from both NFSM and Non-NFSM category Households. Around 42 to 45 percent were primary, middle and matriculation from NFSM and Non-NFSM category family members respectively. Whereas above matriculation there were 22 percent and 21 percent from both beneficiary and non-beneficiary families respectively. In the case of caste category from both NFSM and non-NFSM Households revealed that 47.33 and 53 per cent are from OBC category followed by 39 percent and 34 percent from OC category, 12.33 and 10.00 percent from SC category and 1.33 and 3 percent from ST category. There is a higher annual family income from all sources is Rs.9813 for non-beneficiary farm family than beneficiary farm family due to more agriculture and salaried/pensioners income. There are 67.79 percent and 64.93 percent of operated area occupied by both marginal and small farmers followed by nearly 22 percent area, 30.5 percent and 12.66 percent of area under medium and large farmer's category from beneficiary and non-beneficiary farmers respectively.

The total owned land from NFSM and Non-NFSM beneficiary farmer accounts for 1187.82 acres, and 421.66 acres respectively. Net operated area per HH was stood at 4.33 acres and 5.21 acres in both NFSM and non-NFSM farmers. Leased in land was 120.50 (0.40%) acre and 100.60 (1.01%) and leased out land area was not reported by sample HH reported from beneficiary and non-beneficiary household as well. Further cropping and irrigation intensity stood at 152.80 and 135.42 per cent in NFSM whereas and 153.37 and 137.54 percent reported from Non-NFSM farms. Therefore it may conclude that the non NFSM category per household cropping and irrigation intensity is slightly higher than NFSM category per Household.

NFSM beneficiaries, irrigated area from all sources was reported to be 80.68 percent and the largest area irrigated by canals accounts for 26.83 percent followed by tank irrigation 25.64 percent canal + tube well 17.89 percent. On the other hand, total area under Non-NFSM farmers was 521.26 acres. Out of which 78.87 percent area covered by irrigation and 21.13 per cent of area under rain fed. The highest area was irrigated by canals which accounts for 23.68 percent under non-beneficiaries. Therefore canal irrigation is the major source of irrigation under both NFSM and Non-NFSM beneficiaries. Relating to

tenancy there are two types 1) leasing-in land and Leasing out. Leasing in land area both under NFSM and non-NFSM beneficiaries was reported highest at 56.40 per cent and 46.50 percent (cash) on fixed rent on land. Leasing out land area was not reported by both NFSM and Non-NFSM beneficiaries. Among cereal crops Paddy covered 96.32 per cent and 99.12 percent under both NFSM and Non-NFSM households. Very meagre area was covered by crops like pulses, oilseeds, fruits and vegetables of total GCA of both beneficiaries and non-beneficiaries.

Net return per Household from NFSM beneficiaries (farm business income) accounts for Rs.58,843 and per acre net return was Rs.13,586. Moreover per Household total annual income from all sources stood at Rs.94,155 and non-farm income per Household was Rs.35,312. In the case of Non-NFSM average annual income per Household from farm business income was Rs. 65,793 and non-farm income was Rs.35,740. So the total income per Household was Rs. 1,01,533. On the other hand per acre productivity, gross return, cost of cultivation and net return of Paddy crop under NFSM beneficiaries were estimated and presented at 22.24 Qtls/acre, Rs.30465/acre Rs.19,200/acre and Rs.11,264/acre whereas Non-NFSM farmers per acre Paddy productivity, gross return, cost of cultivation and net returns were reported at 22.01 Qtls/acre, Rs.29,984/acre, Rs.20,264/acre, Rs.9,720/acre respectively. Therefore NFSM beneficiaries per acre productivity, gross returns and net returns per acre reported higher than Non-NFSM farmer productivity and returns, due to little impact of NFSM scheme benefits.

Total value of all farm assets per Household was at Rs.47,268 in NFSM beneficiaries and Rs.54,570 in Non-NFSM category. In terms of credit, commercial banks occupied first position in disbursing loans to both NFSM and Non-NFSM beneficiaries. The outstanding amount stood at Rs.34,623 per Household under NFSM category. Whereas 73 percent of Non-NFSM households availed credit from commercial banks and per Household outstanding loan amount was Rs.48,830. Primary Agriculture Cooperative Societies (PACs) is another important agriculture credit financial institution which accounts for 16.33 percent NFSM beneficiary the outstanding loan per Household was at 6452. Whereas 7 percent of Household taken loan from PACs and per Household outstanding loan amount under Non-NFSM was Rs.2,870. Moreover informal credit was availed to the tune of 20 per cent by each Households from both NFSM and Non-NFSM category. The outstanding amount per HH was Rs.29,524 and Rs.34,670 from both beneficiary and non-beneficiary category from private money lenders. Maximum amount has been borrowed for productive purposes and

the amount was Rs.77,662 and Rs.94,643 from both NFSM and Non-NFSM beneficiaries per Household.

In the course of primary survey, it was found that 100 percent sample farmers got NFSM guide lines such as aims, objectives and benefits through awareness programmes and trainings which were organized at village and mandal level by the Department of Agriculture. Moreover beneficiary farmers are also received information from Krishi Vignana Kendra and farmers/friends. It was found that 100 percent of Households received 50 percent of subsidy received from the HYV/Hybrid rice seed and other inputs. Micro nutrients received in 57 percent of Households, followed by incentives for lime acid soils 35 percent Households, plant protection chemicals 14.33 Households, knap scak sprayers 7.00 percent Households and 5.33 percent Households got 50 percent subsidy benefit from pump sets, INM and IPM under NFSM scheme. It was found that per household average total benefit availed from various components under NFSM paddy crop was Rs.1,866. The annual usage of farm equipment like pump sets were used 13.07 days covering 6.87 acres per beneficiary household and knap sack sprayers (manual and power operated) were used 2.41 days and benefited per beneficiary household was 5.18 acres.

During field survey, it was observed that the NFSM beneficiaries obtained various benefits by utilizing various farm equipment's being provided by the NFSM scheme. Sprayers and pump sets accounted for 84.60 percent and 45 per cent respectively. It is with these equipment's that the agriculture activity was done on time. Majority beneficiary households expressed their opinion that the NFSM farm equipment has helped a lot to increase the productivity under rice crop. Pump sets and sprayers are provided benefits for good plant growth responded by 35.00 percent and 25 percent of beneficiary households respectively. As a part of NFSM scheme, the benefits were provided inputs like HYV/Hybrid seed, INM, IPM Micro nutrients and other farm equipment's. As a result of which the paddy productivity was increased upto 10 percent.

Per acre paddy total cost of cultivation was found at Rs.19,202 and Rs. 20,264 in both NFSM and non-beneficiary farmer. Of all the input costs, hired labour cost was higher in both NFSM and Non-NFSM beneficiaries and the total cost per quintal Paddy production was found to be Rs.863 and Rs.921 both NFSM and Non-NFSM sample farmers. On the other hand paddy crop in Rabi season cost of cultivation per quintal found to be lower, that is Rs.713 for NFSM beneficiary and Rs.804 non-beneficiary farmer. The cost of cultivation per acre and cost per quintal paddy produce found to be higher in kharif than rabi season, whereas under rabi season paddy crop net income per acre was found be more than kharif

crop. According to field survey the farmers of both beneficiaries expressed their produce to sale private channels like local market, merchants and intermediaries.

The logistic regression equation was applied to identify the factors influencing the participation of NFSM beneficiary farmers. From the above analysis reveals that the independent variables like operational holdings (acres), family size, income from farming and credit availed (per acre) and farm asset value (in Rs.) are statistically significant at 1 percent probability level, and other variables age (in years), education dummy 1, education dummy 2, education dummy 3, caste dummy 1, caste dummy 2, caste dummy 3, ratio of irrigated to total operated area are turned out to be not statistically significant even at 10 percent probability level and the education dummy 3 is omitted by STATA package due to co-linearity problem.

In the course of field survey the study found three major constraints expressed by majority of beneficiaries 1) capacity building/technical advice is poor expressed by 43 percent of beneficiaries 2) Wide time gap between the purchase of inputs and receiving input subsidy amount and 3) initial payment for purchasing subsidy inputs is also major constrains under NFSM scheme. Some of the NFSM beneficiaries expressed their anguish about the unnecessary procedural delay for obtaining subsidies like asking documents also political interference in the selection of beneficiaries under the scheme. Most of the beneficiary farmers insisted on institutional credit facility and demanded inclusion of the same in the NFSM scheme for rice crop so as to get better access for loans easily.

NFSM beneficiaries made some suggestions for improvement of the scheme: 42 percent of beneficiaries had suggested to improve timely distribution of inputs, that there should be timely of inputs 27 percent beneficiaries stated that extend the benefits of farm machinery subsidy and supply of farm machinery to more number of beneficiary farmers and 25 percent beneficiaries reported that enhancement of minimum support price for rice through NFSM scheme. Irrigation support by digging bore wells on subsidy basis (11 percent), extension of marketing facilities (11.67 percent) and compulsory crop insurance (18.67 percent) are some of the major suggestions given by NFSM beneficiaries for better improvement of NFSM scheme under rice crop. With regard to non-beneficiary farmers about 35 percent non-beneficiary farmers expressed that there should be crop and farmer insurance to contain farmer suicides.

The study found that there are some reasons for non-participation in the NFSM scheme by non-beneficiary farmers. Out of 100 non-beneficiaries 65 percent of non-

beneficiaries reported that lack of knowledge about NFSM scheme besides participating in some other schemes like RKVY, NHM and ATMA etc. 28 percent of non-beneficiaries replied that inadequate supply of inputs and mostly the selection of beneficiaries based on ruling party in the state.

To conclude some suggestions have been made by non-NFSM beneficiary farmers for the effective implementation of NFSM scheme. 70 percent of non-beneficiary farmers opined that more number of awareness programmes needed to know the benefits from this scheme. 42 percent of the beneficiaries suggested extending agriculture extension services, whereas 35 percent beneficiaries who are marginal and small farmers insisted on the free supply of inputs and minimize political interference in the selection of beneficiaries.

POLICY IMPLICATIONS

- The NFSM scheme should ensure that timely supply of inputs in sufficient quantities to beneficiary farmers.
- More number of distributors under NFSM scheme should be provided, so that the beneficiary farmers can select the farm implement.
- Needy farmers should be provided inputs at more subsidy than present subsidy through NFSM scheme.
- Extend the institutional credit facility at low interest rate can protect the rural farmer from non-institutional credit. Therefore it should be incorporated in NFSM scheme.
- Conduct various awareness programmes include training programmes and agricultural extension programmes at village and mandal level. Canvas through electronic and print media in local language should be done.
- The NFSM scheme should extend killed as well as farm experts are important for proper guidance to educate exclusively marginal and small farmers for utilizing inputs and modern technology.
- To extend the farm machinery like sanction of bore wells (solar) and supply of oil engines by NFSM scheme to wanted farmers can help to increase the productivity.
- The NFSM scheme should initiate to extend the market yards and storage facilities at mandal level in order to reduce private traders.
- Insurance for crop and farmer be made mandatory under the scheme as it helps in reducing farmers' suicides.

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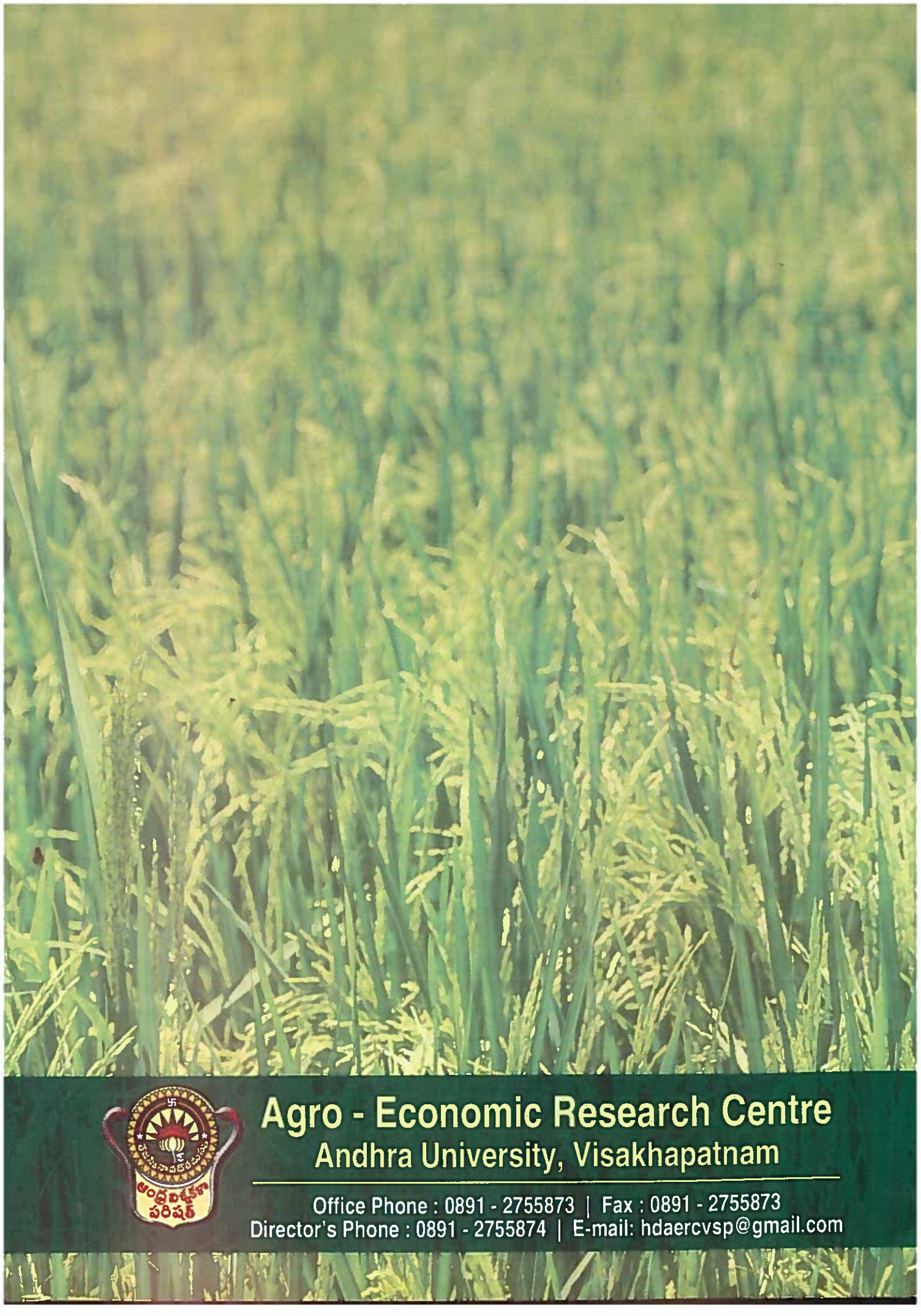
COORDINATOR'S COMMENTS ON THE DRAFT REPORT

"Impact of National Food Security Mission (NFSM) on Input Use, Production, Yield and Income in Andhra Pradesh" Submitted by Agro-Economic Research Centre, Andhra University, Visakhapatnam, Andhra Pradesh.

1. Date of Receipt of the Draft Report: 26th September, 2016
2. Date of dispatch of the comments: 16, February 2017

Chapter wise Comments:

- **Chapter – I**: Table 1.1 and 1.2 regarding Adilabad district data under Rice crop area corrected according to NFSM Website data.
- **Chapter – II:** Table 2.1 and 2.6 Trend in area and Fertilizer use in Andhra Pradesh and Financial Progress under NFSM, Andhra Pradesh has been corrected.
- District wise outlay and expenditure data on Paddy and Pulses for the 11th FYP in Andhra Pradesh is not available. So we are unable to incorporate in the study.
- Table 2.4 and 2.5, the first letter is changed as big letters as suggested by you.
- Table 2.9 followed the table templates which were sent by the co-ordinator.
- **Chapter –III**: Table 3.2 Gross Cropped Area (GCA), Gross Irrigated Area (GIA) and Net Irrigated Area (NIA) per HH data has been added and also modified the write up.
- Table 3.3 and 3.8 changes made according to the table formats sent by the coordinator.
- Table 3.4 the required information is incorporated.
- **Chapter – IV**: Changes incorporated in tables 4.3, 4.4, 4.6 & 4.7 and followed the table format sent by you.
- **Chapter – V**: Correction with respect to table 5.1 and 5.2 has been carried out.
- **Chapter – VI**: Repetition of objectives have been omitted from this chapter and necessary corrections incorporated in the report.
- References page changed to last chapter in the report.



Agro - Economic Research Centre

Andhra University, Visakhapatnam

Office Phone : 0891 - 2755873 | Fax : 0891 - 2755873
Director's Phone : 0891 - 2755874 | E-mail: hdaercvsp@gmail.com