Study No. 180

Impact of National Food Security Mission (NFSM) on Input use, Production, Yield and Income in West Bengal

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Preface

The present study entitled "*Impact of National Food Security Mission (NFSM) on Input use, Production, Productivity and Income in India*" has been undertaken at the instance of the Directorate of Economics and Statistics, Ministry of Agriculture, Government of India. The study has been coordinated by the Agricultural Development and Rural Transformation Centre (ADRTC), Institute for Social and Economic Change (ISEC), Bangalore, Karnataka.

The basic purpose of this study is to assess the impact of NFSM on input use, production and income among the beneficiary farmers by collecting data on area, production and yield of rice under NFSM programme. The other objectives of this study are to identify factors influencing the adoption of major interventions (improved technologies) under NFSM and to identify the constraints hindering the performance of the programme.

It is found that cultivation of rice under unirrigated and irrigated condition was predominant during kharif and summer season respectively in West Bengal. Despite lower interest in pulses cultivation, oilseeds were grown by most of the selected farmers in the study area. No wheat being cultivated in the area under consideration. The fibre crop jute, various vegetables including potato and the horticulture crops like banana and flower were also grown by almost all the selected farmers across the study area.

To identify the factors influencing the decision of farmers regarding participation in the NFSM programme, a logit regression analysis was carried out, taking participation in NFSM scheme as the dependent variable, while treating a number of relevant socio economic variables as independent variables (which might have impact on the decision making process of farmers regarding participation in NFSM). The findings strongly indicate that there might be other factors at work, not included in the logit model, which influences one's decision regarding participation in the NFSM scheme in the study region.

In respect of constraints hindering the performance of NFSM pointed out that there exist a huge information gap between the farmer households and the implementing authority of NFSM regarding proper knowledge of the scheme, eligibility criteria, etc.

It was found that suggestions in all levels centred on making an arrangement for timely distribution of inputs under the scheme, marketing support for hybrid paddy, mass-campaigning about the scheme among the farming community.

The study has been carried out under the leadership of Mr. Debanshu Majumder and Dr. Ranjan Kumar Biswas. The field survey was organized by Mr. Debanshu Majumder in collaboration with Dr. Ranjan Kumar Biswas and Mr. Somenath Ghosh. The entire responsibility of preparation of tables, analysis of data and drafting of the report has been shouldered by Mr. Debanshu Majumder, Dr. Ranjan Kumar Biswas, Dr. Debajit Roy and Mr. Somenath Ghosh. The secretarial assistance has been received from D. Mondal, N. Maji, M. A. Khaleque, D. S. Das and A.Patra. The cover was designed by D. S. Das

On behalf of the centre, the undersigned likes to express sincere thanks and gratitude to Prof. P. Kumar and Dr. A. V. Manjunatha, Agricultural Development and Rural Transformation Centre (ADRTC), Institute for Social and Economic Change (ISEC), Bangalore, Karnataka for their coordination and suggestions at various stages of the study. Special thanks are also due to the Director of Agriculture, Deputy Directors of Agriculture and Assistant Directors of Agriculture in Block, District and State level, Ministry of Agriculture, Government of West Bengal for their kind cooperation during the survey. Last but not the least, I wish to place my highest regards to the diligent growers/farmers in West Bengal who have spared their valuable time to share their precious information with our enumerators without which the present study would have not been completed.

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EXECUTIVE SUMMARY

CHAPTER 1

INTRODUCTION

During 1970s, the Green Revolution of Indian agriculture paved the way for food security in India with high growth in agricultural production and productivity. However, the programme had not succeeded in making India totally and permanently self-sufficient in food. In such a situation, the Government of India, Ministry of Agriculture has launched the National Food Security Mission (NFSM) since 2007- 08 in some selected areas of the country for increasing the production and productivity of rice, wheat and pulses only. The strategy for expansion of cultivated area was considered mainly for pulses and wheat, and productivity enhancement strategy was targeted mainly for rice.

It is in this context it becomes essential to evaluate and measure the extent to which the programme has been successful in achieving the desired goals. Hence, the specific objectives of the present study are:

1. To analyze the trends in area, production, productivity of rice in the NFSM districts in the West Bengal;
2. To analyze the socio-economic profile of NFSM vis-à-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.

The present study on NFSM-Rice was conducted on the basis of survey data collected from sample farmers in selected NFSM districts, viz. West Medinipur (district having highest total production of rice) and Howrah (district having lowest total production of rice) of West Bengal. Not only the primary data, but the secondary data of this specific programme have also been used in this study. The secondary data have been collected from the State Directorate of Agriculture. At the second stage, two Community Development blocks (CD

blocks) have been selected from each district, drawing one Community Development block from the close vicinity (< 5 kms.) of district headquarters and the second at a distance of 15-20 kilometres from the district headquarter. Subsequently, at the third stage, 75 beneficiary farmers and 25 non beneficiary farmers have been selected randomly from each Community Development block with proportional allocation in respect of their operational size-classes and other socio-economic, ethnic and gender characteristics, totaling to a sample size of 300 beneficiary households and 100 non beneficiary households in the West Bengal.

In order to fulfill the first objective, secondary data on area, production and productivity of rice for 9^{th}, 10^{th} and 11^{th} FYP have been used. Compound growth rates, correlation and diagrammatic analysis have been applied using this secondary information.

For fulfilling the requirement of the second objective, third objective and fifth objective descriptive statistics with tabular presentation have been applied.

In order to fulfill the fourth objective a logistic regression model was fitted.

CHAPTER 2

IMPACT OF NFSM ON FOODGRAINS PRODUCTION IN THE STATE – A TIME SERIES ANALYSIS

This chapter focuses on the performance of NFSM program in West Bengal over the plan periods. District wise secondary data on area, production and yield of rice, wheat and pulses have been taken into account for the purpose. Time series analysis was done to perceive the pattern of changes in this respect and to assess the impact of the programme on the said indicators. The major observations of the present chapter are as follows:

- The use of fertilizers in West Bengal showed an increasing trend over the years. The irrigated area has increased during the 9th plan and constant after that. Both the net sown and the gross cropped area remained same over the years and the cropping intensity which seems to be relatively constant around 180 over the year.
- The production and productivity of rice and wheat in the 11th plan has shown a higher trend than the previous two plans and this might have been partially due to the incorporation of the NFSM program from 2007-08. Besides, pulses had shown fluctuations in productivity over the plan. This may indicate somehow the program was failed to bring impact on the productivity of pulses.
- At the disaggregate level, the mean growth rates of productivity of rice were higher in NFSM districts than non NFSM districts during the 11th plan. In case of Wheat, the mean growth rates of its productivity in NFSM districts have increased over the plans. But the mean growth rates of pulses productivity for NFSM districts have declined during the 11th plan from the previous plans (i.e. 9th and 10th plan period). The program might have positive influence in increasing the productivity of rice and wheat
- It is observed that over the years from 2007-08 to 2010-11, the proportion of financial achievement has increased registering 80.41 per cent in 2010-11 (Table 2.7). After that in the year 2011-12 the percentage of achievement has declined. The highest expenditure and outlay for the program has been incurred in the year 2012-2013. But the target and expenditure of funds have declined in the year 2010-11 and 2011-12 with respect to 2009-10.

- It is observed in five years the highest outlay of funds and expenditure has been incurred in the third year of NFSM (2009-10) in most of the districts. After that, in most districts outlay and expenditure of funds were reduced. However the percentage of achievements was increased in most of the districts. This might have indicates allotted funds were utilized more with respect to the time.
- In an analysis of the financial targets and achievements with respect to the component categories of the NFSM programme, it comes out that higher funds were allocated for Demonstrations, distribution, production subsidy, IPM, demonstrations, Micro Nutrients, Plant Protection Chemicals, Soil Amendments and water management than other categories. All these categories are falling under the broad category of **'Crop Demonstration'** and the percentage of allocation for **'crop demonstration'** was increased over the years out of the total allocation. Likewise the allocation higher expenditure of fund was incurred for the **'Crop Demonstration'**. Around 80% of the total expenditure was incurred for 'crop demonstration' in all the years except the year 2008-09.
- Lastly, the percentage change of NFSM expenditure has shown no significant relation with the percentage change in net irrigated areas, percentage change in the use of fertilizer, percentage change in area and production of rice, wheat and pulses.

CHAPTER 3

HOUSEHOLD CHARACTERISTICS, CROPPING PATTERN AND PRODUCTION STRUCTURE

This chapter attempts to analyze the household characteristics, cropping patter and production structure of the selected sample survey households for the study. It tries to draw an economic profile of farm-economy of West Bengal. The main observations of this chapter are as follows:

- The average size of the selected household is 5.0 and 5.4 for beneficiary and non-beneficiary respectively. The average percentage of members engaged in farming in both beneficiary and non-beneficiary farm family is 32.98 and 32.53 respectively. It has been found that 92% of the sample farmers are male and 8% female in the beneficiary farmer category and 99% male and 1% female in the non-beneficiary farmer category. The percentage of male and female of above 15 years old and the children of below 15 years old are almost same for beneficiary and non-beneficiary households. In respect of educational status, about half of the members of the selected households are either illiterate or obtain primary level education. Around 30% of the members (35.33% from beneficiary group and 31.00% from non-beneficiary group) have obtained middle level education. Only 8% and 9% members have obtained matriculation degree and 4.00% and 5.00% members have got their higher secondary degree from beneficiary and non-beneficiary families respectively. Graduation or diploma level of education has been obtained by 2.00 and 3.00 percent members of the selected households and only 0.67% members of the beneficiary families have acquired above graduation/degree level of education. According to caste category information, 53.33% and 60.00% are general category, followed by 40.67% and 34.00% farmers from schedule caste (SC) category, 5.33% and 6.00% from OBC and 0.67% and 0.00% from ST category in the beneficiary and non-beneficiary sample households respectively, across the study area. The overall average annual family income from all sources of the sample households is Rs. 31730.59 for beneficiary farmers, whereas it is Rs. 32538.93 for non-beneficiary farmers in the study area. Thus, there is a higher annual family income of Rs. 808.34 for non-beneficiary farm family over beneficiary farm family. However, agriculture is the earning source of

almost 70 % and 74.33 % of the average annual family income for beneficiary and non-beneficiary sample households respectively. So, we conclude that all the sample households in the study area are primarily farmers by profession. There are 77.6% of the operated area occupied by marginal farmers, followed by medium farmers (14.4% area) & small farmers (8.0% area) of the beneficiary group and 72.5% operated area are under the control of marginal farmers followed by 22.5% area under small farmers and 5.0% area under medium farmers for the non-beneficiary group. No large farm exists in both beneficiary and non-beneficiary group of farmers.

- The total cultivated own land of the sample beneficiary farmers are 250.44 acres. There are 55.56 acres leased-in and 2.50 acres leased-out land for beneficiary farmers. Thus, net operated area is 303.50 acres (cultivated own-250.45 plus leased-in 55.56 minus leased-out2.50), which resulted 1.01 acres net operated area per beneficiary household across the study area. On the other hand, the sample non-beneficiaries have total net operated area of 119.08 acres resulting 1.19 acres net operated area per household across the study area. Another estimates point out that the cropping intensity (194.22%) in the sample beneficiary farms is higher than the cropping intensity (192.73%) in the sample non-beneficiary farms and the irrigation intensity is 196.43% and 198.72% for beneficiary and non-beneficiary farms respectively. So, it may conclude that intensive crop cultivation under assured irrigation facility has been done by the sample farmers across the study area.

- Only tube-well is the main source of irrigation of the beneficiary farmers as it covers 45.31% of the net operated area followed by only canal covering 39.22% of the net operated area. The non-beneficiary farmers use canal water and tube-well water for irrigating 47.27% & 42.80% of their net operated area respectively. However, almost the entire study area has assured irrigation potentiality, as 97% and 94% of the net operated area of beneficiary and non-beneficiary farms respectively has facility for obtaining irrigation. So, we may conclude that the study area is suitable for growing paddy since the supply of water in required amount is important during panicle initiation to flowering stage of the paddy crop.

- Among the beneficiary farmers those were cultivating in leased-in and leased-out land, 40.21% and 28.00% farmers maintain the condition of share cropping for leased-in and leased-out land respectively. Under another terms & conditions prevails in the study area, 55.80% farmers pay fixed rent in cash of Rs.8612.12 per acre for

leased-in land and 72.00% farmers receive fixed rent in cash of Rs.3825.00 per acre for their leased-out land. Again 4.00% farmers pay for leased-in land by kinds @ 8.04 qtls. per acre as fixed rent. Among the non-beneficiary farmers, 29.53% farmers for cultivating leased-in land and 19.32% farmers for cultivating leased-out land exchange a portion of their production with their counterpart. Apart from this system, 63.48% farmers pay fixed rent in cash of Rs. 8835.29 per acre for leased-in land and 80.68% farmers receive fixed rent in cash of Rs.3500.00 per acre for leased-out land. Side by side, 7.00% farmers pay fixed rent by kinds @ 8.53 qtls. per acre.

- The crops those are grown in the study area fall in the four major categories, namely, cereals, pulses, Oilseeds and others. Rice is the only and main crop from cereals cultivated widely across the study area by occupying 83.05% and 90.77% to the gross cropped area in beneficiary and non-beneficiary farms respectively. Only 0.10% and 0.07% area of the total gross cropped area have been allotted for growing lentil and moong in NFSM beneficiary farms and only black gram has been cultivated in a little piece of non-beneficiary lands. In beneficiary farms, three oilseeds crops, namely, groundnut, mustard and sesame have been grown in 0.74%, 0.68% and 3.76% area respectively to the total gross cropped area and in non-beneficiary farms, groundnut, mustard and sesame have been grown in areas of 0.21, 1.18 and 2.98 acres respectively. Others cultivated crops of the study area include jute, vegetables, banana, flower and potato. Among these crops, banana has only been cultivated in beneficiary farms in a small piece (total 1.17 acres only) of land. Remaining four crops have been cultivated in both beneficiary and non-beneficiary farms. Despite higher acreages allotment under cultivation of jute, vegetables, flower and potato in beneficiary farms (total 67.29 acres in beneficiary farms and total 16.61 acres in non-beneficiary farms), the percentage of cultivated area to total gross cropped area is lower for vegetables in beneficiary farms (1.73%) than non-beneficiary farms (4.13%). However, it is clear that area is predominant by rice cultivation. So the selection of this area for NFSM Rice Programme is appropriate.
- The overall average annual family income of the sample households is Rs. 31730.59 for beneficiary farms, whereas it is Rs. 32538.93 for non-beneficiary farms in the study area. But net income from per acre land cultivation of beneficiary and non-beneficiary farms was Rs. 21910.47 and Rs. 20303.69 respectively. The estimation indicates higher earning of beneficiary farms by Rs. 1606.78 over the non-beneficiary

farms from per acre land cultivation. However, the income from non-farm sources is higher (Rs. 9564.50) in beneficiary families than income from non-farm sources (Rs. 8361.30) of non-beneficiary families. It is evident from the estimation of comparative economics of crop cultivation between beneficiary and non-beneficiary farms that gross as well as net farm incomes for all the crops in beneficiary farms are not same, except paddy, than their non-beneficiary counterpart. The gross and net return of paddy in beneficiary and non-beneficiary field are Rs.26130.53, Rs. 26180.24 and Rs. 7887.35, Rs.7955.84 respectively. It is similar in case of mustard and sesame too. But groundnut, however, depicts different picture. Despite higher cost of cultivation, the calculated gross as well as net income from groundnut cultivation is higher for beneficiary farms than non-beneficiary farms. In case of jute cultivation, non-beneficiary farmers go to the higher expense for per acre cultivation and they get higher gross as well as net return than beneficiary farmers. But in the vegetable field, despite higher expenses incurred, lower net return has been received by beneficiary farmers than non-beneficiary farmers. Again flower and potato cultivation provide a higher net return for non-beneficiary famers, though they spent comparatively lower amount of rupees for these crop cultivation than beneficiary farmers.

- Only 5.33% and 3.33% beneficiary farmers and only 5% non-beneficiary farmers have costly implement namely, Tractor and Electric Pumpset respectively and only 2% beneficiary farmers have another costly implement Power Tiller. Among the medium cost implement, only 27% beneficiary farmers and 18% non-beneficiary farmers have Diesel Pumpset. Among the sample farmers, 82.33% beneficiary and 87% non-beneficiary farmers have low cost implement like Knapsack Sprayers. Again, 71.67% beneficiary and 71% non-beneficiary farmers is the owner of another low cost implement Paddy Thresher. There are no other remarkable farm implements with the sample farmers, except some Spade, Sickle, etc.
- Only the Commercial Bank and Primary Agricultural Credit Society (PACS) have played more or less significant role for sanctioning loan to the sample farmers. There are 24.7% and 19% beneficiary and non-beneficiary farmers respectively who have got loan from Commercial Bank. The Primary Agricultural Credit Society (PACS) has sanctioned loan for 14% beneficiary farmers and 6% non-beneficiary farmers. Other sources like, Government Agencies, Intermediaries, Self Help Group (SHG),

Non-Government Organization (NGO), etc do not play remarkable role for sanctioning loan to the selected sample farmers.

- It is evident from enquiry that maximum amount has been borrowed for housing purpose (Rs. 135000/-) followed by business (Rs. 24000/-) and agriculture (Rs. 20704.31) purposes by the beneficiary farmers. On the other hand, the non-beneficiary farmers have borrowed only for agriculture purpose by the amount of Rs. 30592.59.

CHAPTER 4

NFSM INTERVENTIONS AND ITS IMPACT ON FARMING

In this chapter, we have made an attempt to analyze the state and nature of intervention under NFSM in West Bengal and its impact on farming, specifically crop productivity. The main observations of the present chapter are presented below as follows:

- In course of the primary survey it was found that the farmers in general were aware about the NFSM programme. The Department of Agriculture and the Panchayat carried out local level awareness meetings and programmes in all the blocks. However, only 22 per cent of non-beneficiary farmers in West Medinipur and 34 per cent in Howrah reported lack of awareness about the project. In both the districts 8 per cent of the beneficiary respondents were women. It is revealed from the data that the state department of agriculture has been instrumental in imparting awareness among the farmers regarding NFSM in three CD blocks out of the four. In one block, however, fellow farmers and friends played an important role in this connection. Enhancements of awareness through print and electronic media have had little impact in the areas under consideration. The progressive farmers of Howrah district, however, played a significant role in course of increasing awareness among the farmers.

- Amount of subsidy on seeds distributed to the beneficiary farmers in aggregate accounted for 92 per cent of the total cost on seed. Costs on PPC, INM and IPM per beneficiary households accounted for 86.1 per cent, 60.81 per cent and 24.67 per cent of respective costs. Apart from distribution of HYV/Hybrid seeds (ARIZE 6444 – Hybrid variety and MTU 7029, MTU 1010 – HYV) the distribution of Plant Protection Chemicals (PPC) and measures regarding Integrated Nutrient Management (INM) were undertaken at a significant scale.

- None of the beneficiary had been provided with farm equipments under the scheme. This might have been due to the fact that NFSM is being implemented in the survey areas for the first time in 2013-14. On the whole it can be said that implementation of NFSM programme in the areas under consideration had centered primarily around block demonstrations of rice.

- As regards to the impact of the programme to increase the productivity, most of the farmers were of the opinion that the new and improved variety has been effective in increasing the productivity of rice. Out of 300 beneficiary farmers, 46.7 per cent opined that the increase was less than 5 per cent while 34. 7 per cent agreed upon that the increase to be between 5 to 10 per cent and 7.3 per cent was of the impression that the increase in productivity was between 10 to 15 per cent**.** No substantial differences between the responses across the blocks or districts were visible as to demonstration benefits. In course of the survey the farmers seemed to be quite happy with the productivity response of the supplied seed.

- In terms of productivity of the crop (paddy), the NFSM farmers seem to reap the benefit of improved variety particularly in the summer season. Hence, in aggregate gross and net return from crop enterprise is gainful for the ones having NFSM benefits. Moreover, if one deducts the subsidy amount from the total cost, the net income of the beneficiary households increase substantially. Given the subsidy in respect of seeds, micro nutrients and plant protection chemicals, the beneficiary farmers exhibit better net return from crop enterprise than their non-beneficiary counterpart. Turning to the cost components, it is revealed that NFSM beneficiaries employ more family labour than the non-beneficiaries. So, in a sense the NFSM technology with its provision for subsidies has had its impact in increasing productivity and income of the beneficiary farmers.

- It is evident from the primary data that over 80 per cent of the total output of Paddy, barring summer crop by NFSM beneficiaries, is being sold out by all categories of farmers. Among the beneficiary farmers cultivating summer rice, leaving Debra aside, the sale of output is around 70 per cent of the gross output. Retention of the Summer produce by the beneficiaries of this block is strikingly high. It should be remembered that hybrid seeds were distribute in this region for crop demonstration. The coarse grain from hybrid paddy posed hindrance in marketing the output. At the same time, the local traders remained disinterested in purchasing the hybrid produce as the rice millers did not accept such a meagre quantity. The respondents seemed to be quite satisfied with its productivity response but at the same time they were unhappy as regards to its market prospects. Hence, it ended up with a forced retention of 82.4 per cent of total output.

- In the scenario of marketing, one would find that the local merchants play the key role. Being a small producer it is difficult for them to take the advantage of retail selling by their own effort. This remains true for beneficiary as well as non-beneficiary farmers with the exception of hybrid cultivators in Debra, where they had to shoulder the main burden of marketing the produce.

CHAPTER 5

PARTICIPATION DECISION, CONSTRAINTS AND SUGGESTIONS FOR IMPROVEMENT OF NFSM

This chapter, broadly speaking, aims at analyzing the factors influencing the decision making process of farmers regarding participation in NFSM programme. At the same time, this chapter tries to identify the constraints faced by the beneficiary farmers while availing benefits from the scheme. It also takes account of suggestions made by the beneficiary as also non-beneficiary farmers regarding further improvements in performance and reach of the scheme. The major observations from this chapter are:

- First, as farmers are often hesitant or reluctant in adopting something new or participating in a new government programme, it is important to identify the factors influencing the decision of farmers regarding participation in the NFSM programme. For this, we have carried out a logit regression analysis, taking participation in NFSM scheme as the dependent variable, while treating a number relevant of socio economic variables as independent variables (which might have impact on the decision making process of farmers regarding participation in NFSM). However, the result of our logit regression model fails to fit to our data, while a correlation coefficient matrix ascertains the results by ruling out the possibilities of multicollinearity problem that might affect the outcome of our regression model. The findings thus strongly indicate that there might be other factors at work, not included in our logit model, which influences one's decision regarding participation in the NFSM scheme in the study region.
- Second, in case of constraints in availing benefits under the NFSM scheme, it comes out that the performance of the scheme relating aspects like promptness in availing subsidy amount in relation to actual purchase of subsidized inputs, quality of inputs distributed, paper works for enrolling into the scheme, procedure for availing benefits, etc. remained satisfactory on the whole. The problems faced regarding the above mentioned aspects were reported only in specific areas for specific issues. Supportive measures like institutional financing and technical guidance was satisfactory also, as has been reported by the beneficiary farmers of the NFSM scheme. It, however, must be noticed here that there exists a huge information gap between the farmer

households and the implementing authority of NFSM regarding proper knowledge of the scheme, eligibility criteria, etc. Concerned authorities may please note this and take proper steps to narrow down the prevalent information gap.

- Third, in case of suggestions for improvement by the beneficiary farms, it is extremely important to note that about a half of the beneficiaries complained about timely distribution of inputs under the scheme, which needs to be addresses properly by the implementing authorities. Apart from this, there has been a strong suggestion for arranging marketing support for paddy by more than one-fourths of the beneficiary farmers, as marketing of hybrid varieties of paddy posed a major challenge to the farmers growing hybrid rice. The problem of marketability of paddy, especially the hybrid variety, has also been widely reported also by the non-beneficiary farmers. This strongly suggests that there has been an acute need for marketing support to be extended towards the farming community in general and towards the hybrid paddy growers in particular.
- Lastly, though it is often quite challenging for the authorities to take farmers into confidence regarding participation in government programmes, it was time and again suggested by the non-beneficiary farmers that lack of knowledge regarding the scheme was one the leading factors behind non-participation in NFSM. This again calls for greater thrust on mass-campaigning about the scheme among the farming community. It may also be noted here that political interference has also been held responsible for non-participation in government programmes like NFSM, which needs to be neutralized for achieving greater participation of farmers in general.

CHAPTER 6

CONCLUDING REMARKS AND POLICY SUGGESTION

The National Food Security Mission programme was launched to enhance the productivity of rice, wheat and pulses to bridge the demand supply gap and ensure food security to the people. Since inception in 2007-08 (initial years of 11th plan) the programme has taken the shape of crop demonstration of improved verities of seeds associated with other components like making provisions for INM, IPM, improved farm implements etc. The NFSM programme called for implementation of cropping system centric interventions in a cluster approach in the agrarian sector through participation of farmers vis-à-vis the agricultural experts.

For a public sector scheme review of its performance is as important an aspect as the scheme itself. Hence, an evaluation study was carried out on the basis of primary survey in two districts of West Bengal to assess the impact of NFSM. The present study had some specific objectives of which we had discussed at length in our introductory chapter. In view of these objectives we shall now attempt to assess its impact among the beneficiaries of NFSM vis-à-vis the farmers who could not avail the NFSM benefits (i.e. the non-beneficiaries).

Concluding Remarks

The concluding remarks of the study specific to objectives spelt out earlier are presented here as follows:

- District wise secondary data on area, production and yield of rice, wheat and pulses were analyzed to get an overall picture of the state. It came out that the productivity of rice and wheat has increased over the 11th plan. During the last plan productivity of rice has increased from 25.73 quintal/hectare in 2007-08 to 27.44 quintal/ hectare in 2011-12 and the productivity of wheat has increased from 26.02 quintal/ hectare in 2007-08 to 27.65 quintal/hectare in 2011-12. This may point towards a successful implementation of the program. But in case of pulses, productivity responses seemed to be fluctuating over the years.
- No major change in net sown area and gross cropped area was observed. There was almost no enhancement in the area under cultivation. However, net and gross irrigated area along with fertilizer consumption revealed substantial augmentation.

- Variation in productivity of crops across districts in West Bengal over the years from 2007-08 to 2011-12 was analyzed with district level data. It turned out that the average annual growth rate of rice in the NFSM districts was higher as compared to the same for non-NFSM districts during 11th plan. On the contrary productivity response of wheat in the NFSM districts in general was lower than the non-NFSM ones in the same period. However, the districts covered under wheat programme had a very poor productivity of wheat during 9th and 10th plans. During the 11th plan productivity of the crop in these districts geared up. NFSM pulses programme covered all the districts of the state. But no conclusive judgment can be made as there is wide variation among the districts in terms of productivity of pulses.
- During the 11th plan financial achievement towards NFSM target in West Bengal accounted for over 67 per cent.
- Component specific allocation of funds reveals that crop demonstration and subsidy were given foremost priority. Allocation towards micro nutrients, plant protection chemicals and chemicals for soil amelioration were close followers.

Productivity of rice in particular has responded positively to NFSM programme in West Bengal. Financial achievement was on the better side registering about two-third utilization. Component specific outlay centered around crop demonstration, plant protection and nutrition.

- The average size of household was 5.0 and 5.4 for NFSM and non-NFSM families respectively. Literacy rate among the respondents accounted for around 77 per cent in both the groups of farmers. Out of 300 NFSM farmers over 46 per cent were from scheduled and backward caste families. The similar proportion for non-NFSM households was 40 per cent.
- Both NFSM & non-NFSM respondents were mostly marginal farmers (95% & 91% respectively) where about one third of the total members are engaged in farming activities. Average operational holding size comes out as 1.01 & 1.19 acres for B & NB farmers respectively. There is not much of a difference in irrigation intensity (II) and cropping intensity (CI) between the two groups.

- Crop enterprise among both the groups is dominated by rice where proportion of rice in GCA is 83 per cent among NFSM farmers and 90 per cent among non-NFSM farmers. Yield rate of rice is just over 18 quintals per acre for both the groups. The overall average annual family income from all sources of the sample households is Rs. 31730.59 for beneficiary farmers, whereas it is Rs. 32538.93 for non-beneficiary farmers in the study area.
- Average value of farm assets was to the tune of Rs.8626.57 for NFSM and Rs. 5670.75 for non-NFSM farmers. On the other hand, productive credit per beneficiary household was Rs.20840.50 while it was Rs.30592.59 for non-beneficiaries.

In this study, the beneficiaries of NFSM programme and non-NFSM farmers exhibit similar socio-economic and agricultural profile and hence, results seem comparable between the treatment and control groups.

- It was found that the farmers in general (both NFSM and non-NFSM) were aware about the NFSM programme. It is revealed from the data that the state department of agriculture has been instrumental in imparting awareness among the farmers regarding NFSM. However, fellow farmers and friends along with progressive farmers (in Howrah) played an important role in this connection too. Enhancements of awareness through print and electronic media have had little impact.
- Amount of subsidy on seeds distributed to the beneficiary farmers in aggregate accounted for 92 per cent of the total cost on seed. Costs on PPC, INM and IPM per beneficiary households accounted for 86.1 per cent, 60.81 per cent and 24.67 per cent of respective costs. Distribution of seeds, plant protection chemicals (PPC) and measures regarding integrated nutrient management (INM) were undertaken at a significant scale.
- No improved farm equipments were provided to the NFSM farmers for the fact that the programme was launched in the area for first time in 2013-14.
- Out of 300 beneficiary farmers, 88.7 per cent had the opinion that the new and improved variety has been effective in increasing the productivity of rice. Farmers seemed to be quite happy with the productivity response of the supplied seed.

- In terms of quantum of production of rice per acre the NFSM farmers have a clear edge over the non-beneficiaries. Moreover, as subsidy amount is deducted from the total cost net return from rice cultivation of the beneficiary households increase substantially than their non-beneficiary counterpart.
- A substantial part total output of paddy, barring summer crop by NFSM beneficiaries of Debra, is being sold out by all categories of farmers. Retention of the produce by the beneficiaries in Debra is strikingly high. It should be remembered that hybrid seeds (ARIZE 6444) were distribute in this region for crop demonstration. The coarse grain from hybrid paddy posed hindrance in marketing the output. At the same time, the local traders remained disinterested in purchasing the hybrid produce as the rice millers did not accept such a meagre quantity. In the scenario of marketing, the local merchants play the key role.

The NFSM technology with its provision of subsidized improved seeds, INM and IPM measures has had its impact in increasing productivity and income of the beneficiary farmers. The respondents seemed to be quite satisfied with its productivity response but at the same time they were unhappy as regards to the market prospects of hybrid seeds.

- To identify factors influencing the adoption of NFSM we have carried out a logit regression analysis, taking participation in NFSM scheme as the dependent variable. However, the result of our logit regression model fails to fit to our data, while a correlation coefficient matrix ascertains the results by ruling out the possibilities of multicollinearity problem that might affect the outcome of our regression model.

The findings strongly indicate that there might be other factors at work, not included in our logit model, which influences one's decision regarding participation in the NFSM scheme in the study region. We propose further research in this area.

- It comes out that the performance of the scheme relating aspects like quality of inputs, paper works for enrolling into the scheme, procedure for availing benefits, etc.

remained more or less satisfactory on the whole. But there exists a huge information gap between the farmer households and the implementing authority of NFSM regarding proper and comprehensive knowledge of the scheme, eligibility criteria, etc.

- It is extremely important to note that about a half of the beneficiaries complained about timely distribution of inputs under the scheme.
- There has been a strong suggestion for arranging marketing support for paddy by more than one-fourths of the beneficiary farmers, as marketing of hybrid varieties of paddy posed a major challenge to the farmers growing hybrid rice.
- It was time and again suggested by the non-beneficiary farmers that lack of knowledge regarding the scheme was one the leading factors behind non-participation in NFSM.

It appeared that there exists a huge information gap regarding proper and comprehensive knowledge of NFSM. Complains were received about timely distribution of inputs. There was suggestion for arranging marketing support for paddy specially hybrid varieties.

Policy Suggestions

On the basis of the findings of this study and concluding observations, the following recommendations and policy suggestions are proposed:-

- West Bengal has exhibited a high potential for yield enhancement of rice in particular and wheat to a certain extent. Pulses, though fluctuations are observed, might have potential for augmentation of yield. There remains a huge scope to exploit this potential through technology dissemination programme like **NFSM** and hence the **programme should continue with greater effort**.
- Interventions through crop demonstrations coupled with INM and IPM practices have helped the farmers in reaping the benefits in view of increase in productivity and income from crop enterprise. Such **demonstration programmes should be encouraged**.

- An all round effort should be made to **ensure the timeliness of input delivery system** prescribed under the recommended technology.
- It is **very necessary** for further growth **that improved farm implements are distributed** among the beneficiaries. Implements once distributed could be used and taken care of by the farmers' own organizational arrangement on sharing basis. This may boost the attitude of co-operation among the farmers.
- There exists an information gap as to comprehensive knowledge of NFSM. A **widespread knowledge about such programmes is required for developing responsiveness** among farmers.
- **Seed minikits** that are being distributed for crop demonstration **may be in line with the consumption basket of the locality**. For people are generally reluctant to adopt new food habit.
- Marketing of produce seemed to be one of the major problems in the agrarian sector. And private local traders dominate the scenario. **Marketing co-operative societies could be formed by the farmers** themselves in localities. Panchayats may also initiate formation of such societies.
- In course of the study we had the impression that the programme implementation followed a sort of top-down approach. For it was expressed by a large section of non-beneficiaries having no knowledge about the scheme. **Widespread awareness** in the locality (irrespective of whether an intended beneficiary or not) **is necessary and participation at the grass root** may raise the local needs and **create an environment for a bottom-up planning process**.

CHAPTER 1

INTRODUCTION

1.1. Introduction

Agriculture sector still contributes 14 per cent of the nation's GDP, 11 per cent of its exports and occupation for about half of the population is playing an important role for the Indian economy. Besides, the Indian economy, even now, depends on agriculture as its primary source of income while it provides raw material for a large number of industries (GoI, 2012-13). But it has been observed recently 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. During the same time period, the growth rate of yield of food grains decreased from 3.21 per cent to 1.04 per cent. The growth rate of production of other agricultural commodities also declined. The evidence of this fact has been observed by the decelerated agriculture growth from 3.5 per cent during the period 1981-82 to 1996-97 to around 2 per cent during 1997-98 to 2004-05. But during the recent years, there have been a positive signs of improvement in agricultural production (Dev and Sharma, 2010; Kumar 2013 and GoI 2012-13). This improvement in agricultural production occurred mainly due to the initiatives taken by the central Government and implementation of some important programs, such as *Rastriya Krishi Vikas Yojana* (RKVY), *National Food Security Mission* (NFSM), *National Horticultural Mission* (NHM) and other various sub-schemes. At the same time the state experienced substantial increase in the outlay on agriculture (GoI 2012-13, Kumar 2013).

Primarily the food security has three objectives. These are:

i) To ensure production of adequate food supplies,
ii) To maximize stability in the flow of supplies, and
iii) To secure access to available supplies on the part of those who need them.

Again access to food has two defined components to it. These are:

a) Interventions aimed at boosting agricultural productivity, and

b) Adopting strategies to promote employment, social protection measures cash transfers to the poor to improve their access to the available food.

Social protection has already in place as a component of food security in India. Side by side the enactment of the National Food Security Act is yet another significant step in the series of social protection measures under public policy, to support well targeted food security and nutritional improving interventions. In this circumstance, only the increased agricultural production and productivity may provide a safety net to the fast growing population.

During 1970s, the Green Revolution of Indian agriculture paved the way for food security in India with high growth in agricultural production and productivity. However, the programme has not succeeded in making India totally as well as permanently self-sufficient in food. The requirement of HYV seeds for all crops and for all regions has not been extended. The agriculture productivity for most of the crops has stagnated since mid 1990s. This happened as there was no emergence of major technological breakthrough since the heralding of the Green Revolution. From that very time a strong need for a second Green Revolution with the development of areas and crops which remained untouched in the earlier Revolution, is being felt more.

In the early 1990s, the structural change initiated by the reform process transformed the economy completely. This has been evident from the remarkable annual growth rate of GDP by 8.3 percent achievement during 2009-10 from 5.3 per cent in 1990-91. The reforms process transformed the services sector much more than that of manufacturing and agriculture sector. As a result, the services sector's contribution to the GDP increased from 49.60 per cent in 1990-91 to 67.40 per cent in 2009-10, as against drastic decline from 24.90 per cent to 12.40 per cent of the agriculture sector during the same time period (Department of Economics and Statistics, 2013). During the same time period, the manufacturing sector’s share was shown a marginal downward trend from 20.69 to 18.90 per cent.

However, despite half of the population working in agriculture, Indian economy was encountering a situation where supply of food grains fell short of demand for consumption, mainly due to rising population. Dev and Sharma (2010) indicated more specifically that 1/3rd of the Indian population are faced with extreme poverty. Besides, they further noted that half of the Indian children were malnourished. Thus the situations strongly demand for *Food Security* of the nation.

Launching of the National Food Security Mission (NFSM)

In such a situation, the Government of India, Ministry of Agriculture has launched the National Food Security Mission (NFSM) since 2007- 08 in some areas of the country. The Mission is nothing but essentially a crop development scheme and it has been launched for increasing the production and productivity of rice, wheat and pulses only. Because, these three crops constitute nearly 85 per cent of food grains required for the nation. The aims of the Mission are restoring soil health and achieving additional production of 10, 8, and 2 million tons of rice, wheat and pulses, respectively in an area of 20 million ha, 13 million ha and 4.5 million ha by the end of the year 2011-12.

The mission adopted twofold strategy for minimizing the gap between demand and supply of food grains. As per decision, the first strategy was related to expand the cultivated area, and the second strategy was to minimize the productivity gap between potential yield and actual yield of food crops. The strategy for expansion of cultivated area was considered mainly for pulses and wheat, and productivity enhancement strategy was targeted mainly for rice. The strategy for increasing productivity was based on mainly on the:

- Acceleration of quality seed production;
- Emphasizing INM and IPM;
- Promotion of new production technologies;
- Supply of adequate and timely inputs;
- Popularizing improved farm implements;
- Restoring soil fertility;
- Introduction of pilot projects like community generator and blue bull; and
- Resource conservation technologies along with capacity building of the stakeholders to get the identified crops to the next stage of development.

A total amount of Rs 4500 crores have been spent under NFSM during the 11th FYP (GoI 2014).

It is obvious from the above discussion that the sole objective of NFSM was to escalate the production of rice, wheat and pulses. Another important objective was to generate employment opportunities for the rural population. To achieve the goals of NFSM by fulfilling these strategies, the programme was implemented first in 561 districts of 27 states in the country (GoI 2013). Besides the NFSM, RKVY programme was also launched during the same time period. In addition, a number of several other State and Centrally

Sponsored Programmes were running parallel with the NFSM programme. And rice production at the end of 11th Five Year Plan experienced an increased by 12.1 million tonnes over 2006-7. At the same time, production of wheat and pulses increased by 19.1 million tonnes and 3 million tonnes respectively (GoI 2012).

1.2. Background of NFSM in the State

State Food Security Mission Executive Committee (SFSMEC)

The Government of West Bengal has nominated a State level autonomous agency, named, the West Bengal State Food Security Agency (WBSFSA). This is a variant of State Food Security Mission Executive Committee (SFSMEC). Similarly, in most of the sampled districts, the Agricultural Technology Management Agency (ATMA), another autonomous body that has been established under the Societies Registration Act came into being. ATMA is responsible for implementing Mission's programme at the district level.

The state level agency is involved in the preparation of State Action Plan in consonance with the Mission's goals and objectives in close coordination with State Agriculture Universities (SAUs) and Indian Council of Agricultural Research (ICAR) Institutes. Besides arranging workshops, seminars and training programmes for farmers, these agencies were also entrusted to organize several programmes for diverse skill up-gradation of district, block and grassroots workers in different areas such as farming system approach, participatory management, community mobilization, computer application, etc.

District Food Security Mission Executive Committee (DFSMEC)

The District Food Security Mission Executive Committee (DFSMEC) has been duly constituted in West Bengal under the chairmanship of the District Magistrate for project formulation, implementation and monitoring of the scheme components.

During the initial year of the programme, i.e. 2007-08, there were no meetings convened in any of the districts of West Bengal. But the position improved latter on. Meetings were held in most of the districts in 2008-09. The number of meeting varied between 1 and 3 during this period. In fact, the committee meetings need to be convened on quarterly basis so that proper focus on the implementation of the programme is given.

Project Management Team (PMT) and Appointment of Consultants

There is a Project Management Team (PMT) at the State and district level in West Bengal. This PMT has the responsibility to ensure collaboration amongst line departments to achieve the targets. But the PMTs constituted at the district level were mostly redundant.

As per information collected from the Department of Agriculture, Government of West Bengal, the initial year of the programme, i.e., 2007-08, was mainly utilized by most of the districts in completing the process of selection / appointment of Consultants. Hence, no field visits by the Consultants could be taken during the said year. But, during the year 2008-09, 54 field visits were undertaken by the Consultants in the state. But surprisingly no visits were undertaken by the Consultants in any of the districts of West Bengal state in 2009-10 and 2010-11.

The fact is that the Consultants appointed at the district level were mostly utilized for office work of routine nature and not for the intended specialized technical service. Another reason for lack of interest in field visit was absence of any provision for payment of Travelling Allowance (TA) for the contractual appointees like, the Consultants and Technical Assistants appointed on Contractual basis at the District level. At present the appointment of Consultants and Technical Assistants remains stop due to sub-judice matter since last 2012-13, (*Mid Term Evaluation of NFSM, AFCL, 2012*).

There were no posting of one suitable Agriculture Officer exclusively for Mission's work at district level. In most of the sampled districts, there was only one Agriculture Officer at the district level dealing Mission's work with several Government of India and State Government programmes besides other routine matters. This is quite inadequate. (*Mid Term Evaluation of NFSM, AFCL, 2012*).

Districts Selection by the State

The picture of selected districts for rice, wheat and pulses of this specific NFSM programme in the 11th and 12th Five Years Plan has been depicted in Table 1.1 and Table 1.2 respectively. It has been observed from the aforesaid tables that NFSM_Rice and NFSM_Wheat programmes covered 8 districts and 4 districts respectively throughout the 11th Five Years Plan. On the other side, NFSM_Pulse programme covered 5 districts in 2007-08, 2008-09 and 2010-11.

But in 2009-10 and 2011-12 onwards the NFSM_Pulse programme attained maximum importance having covered 18 districts. Another important point may be underlined hare that although there was no change in number of selected districts for NFSM_Rice and NFSM_Wheat programme in the 11th Five Years Plan, but a change occurred in both the programmes in 12th Five Years Plan. It has been observed from Table 1.2 that NFSM_Rice programme ceased in one district, namely, West Medinipur and NFSM_Wheat programme ceased in the whole state during the period 2014-15 and 2015-16. Perhaps, unwillingness of the farmers of West Bengal state and unexpected result of previous years' experiment is the reason to cease the NFSM_Wheat programme in the state West Bengal.

Table 1.1: Year-wise District wise Coverage under NFSM in West Bengal during 11th FYP

Crops	District covered under NFSM				
	2007-08	**2008-09**	**2009-10**	**2010-11**	**2011-12**
Rice	South 24 Parganas, Coochbehar, Uttar Dinajpur, Howrah , Jalpaiguri , East Medinipur, West Medinipur, Purulia **(8)**	South 24 Parganas, Coochbehar , Uttar Dinajpur, Howrah , Jalpaiguri , East Medinipur, West Medinipur, Purulia **(8)**	South 24 Parganas, Coochbehar , Uttar Dinajpur, Howrah , Jalpaiguri , East Medinipur, West Medinipur, Purulia **(8)**	South 24 Parganas, Coochbehar , Uttar Dinajpur, Howrah , Jalpaiguri , East Medinipur, West Medinipur, Purulia **(8)**	South 24 Parganas, Coochbehar , Uttar Dinajpur, Howrah , Jalpaiguri , East Medinipur, West Medinipur, Purulia **(8)**
Wheat	Coochbehar , Dakshin Dinajpur, Uttar Dinajpur, Jalpaiguri **(4)**	Coochbehar , Dakshin Dinajpur, Uttar Dinajpur, Jalpaiguri **(4)**	Coochbehar , Dakshin Dinajpur, Uttar Dinajpur, Jalpaiguri **(4)**	Coochbehar , Dakshin Dinajpur, Uttar Dinajpur, Jalpaiguri **(4)**	Coochbehar , Dakshin Dinajpur, Uttar Dinajpur, Jalpaiguri **(4)**
Pulses	Birbhum, Maldah , Murshidabad, Nadia , Purulia **(5)**	Birbhum, Maldah , Murshidabad, Nadia , Purulia **(5)**	North 24 Parganas, South 24 Parganas, Bankura, Bardhman, Birbhum, Coochbehar, Darjeeling, Dakshin Dinajpur, Uttar Dinajpur, Hooghly , Howrah, Jalpaiguri, Maldah, East Medinipur, West Medinipur, Murshidabad , Nadia, Purulia **(18)**	Birbhum, Maldah , Murshidabad, Nadia , Purulia **(5)**	North 24 Parganas, South 24 Parganas, Bankura, Bardhman, Birbhum, Coochbehar, Darjeeling, Dakshin Dinajpur, Uttar Dinajpur, Hooghly , Howrah, Jalpaiguri, Maldah, East Medinipur, West Medinipur, Murshidabad , Nadia, Purulia **(18)**

Source: http://www.nfsm.gov.in/nfmis/stateprofile/District.aspx
Note: Figures in parenthesis are number of districts covered under NFSM.

Table 1.2: Year-wise District wise Coverage under NFSM in West Bengal during 12th FYP

	District covered under NFSM			
Crops	**2012-13**	**2013-14**	**2014-15**	**2015-16**
Rice	South 24 Parganas, Coochbehar, Uttar Dinajpur, Howrah, Jalpaiguri , East Medinipur, West Medinipur, Purulia **(8)**	South 24 Parganas, Coochbehar , Uttar Dinajpur, Howrah , Jalpaiguri , East Medinipur, West Medinipur, Purulia **(8)**	South 24 Parganas, Coochbehar , Uttar Dinajpur, Howrah , Jalpaiguri , East Medinipur, Purulia **(7)**	South 24 Parganas, Coochbehar , Uttar Dinajpur, Howrah , Jalpaiguri , East Medinipur, Purulia **(7)**
Wheat	Coochbehar, Dakshin Dinajpur, Uttar Dinajpur, Jalpaiguri **(4)**	Coochbehar, Dakshin Dinajpur, Uttar Dinajpur, Jalpaiguri **(4)**	Not Covered	Not Covered
Pulses	North 24 Parganas, South 24 Parganas, Bankura, Bardhman, Birbhum, Coochbehar, Darjeeling, Dakshin Dinajpur, Uttar Dinajpur, Hooghly , Howrah, Jalpaiguri, Maldah, East Medinipur, West Medinipur, Murshidabad , Nadia, Purulia **(18)**	North 24 Parganas, South 24 Parganas, Bankura, Bardhman, Birbhum, Coochbehar, Darjeeling, Dakshin Dinajpur, Uttar Dinajpur, Hooghly , Howrah, Jalpaiguri, Maldah, East Medinipur, West Medinipur, Murshidabad , Nadia, Purulia **(18)**	North 24 Parganas, South 24 Parganas, Bankura, Bardhman, Birbhum, Coochbehar, Darjeeling, Dakshin Dinajpur, Uttar Dinajpur, Hooghly , Howrah, Jalpaiguri, Maldah, East Medinipur, West Medinipur, Murshidabad , Nadia, Purulia **(18)**	North 24 Parganas, South 24 Parganas, Bankura, Bardhman, Birbhum, Coochbehar, Darjeeling, Dakshin Dinajpur, Uttar Dinajpur, Hooghly , Howrah, Jalpaiguri, Maldah, East Medinipur, West Medinipur, Murshidabad , Nadia, Purulia **(18)**

Source: http://www.nfsm.gov.in/nfmis/stateprofile/District.aspx
Note: Figures in parenthesis are number of districts covered under NFSM

Extension Activity for NFSM in the state

Involvement of KVKs

It has been envisaged that Krishi Vigyan Kendras (KVKs) will play a proactive role for successful implementation of the NFSM programme. But, the feedback obtained from the sampled districts as well as sample farmers of the selected districts for this study in respect of the involvement of KVKs in the extension activity reveals that there was no involvement of KVKs in any of the activities under NFSM. As a result, the Project Implementing Authority (PIA), i.e. the District level agency has failed to utilize the technological potentiality of KVK.

Involvement of NGOs / SHGs

Despite the scope of involvement of Non-Government Organizations (NGOs) and Self Help Groups (SHGs) in the implementation process of NFSM, the study has revealed that there was no involvement of any NGO or SHG for this particular programme. Some SHGs

provided loan to beneficiary farmers for over all agricultural operation, not for particularly NFSM programme.

Publicity and Information Technology

Successful launching of any new programme depends greatly on its publicity. To popularize the NFSM programme, the sample districts have adopted the following publicity measures:

Use of the Print Media

The official information from Block as well as District level Agriculture Officer pointed out that all the sampled districts have brought out leaflets, pamphlets, brochures etc. for creating awareness of the NFSM programme among the farmers. However, it has been found that the main source of information to the rice-beneficiary about the activities of the NFSM was the State Agriculture Department, Gram Panchayet and Farmers/Friends.

Collaboration among Line Departments

Collaboration among the line departments is essential for success of a programme, like NFSM. But it has been observed during the survey that the collaboration among the line departments was absolutely lacking in all the sampled districts. Actually, there is lack of ownership even among officials and also among many farmers. Thus, the vertical and horizontal linkage between line department and farmers has to go a long way.

1.3. Main objectives and Scope of the study

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

Scope of the study:

The per capita net availability of cereals and pulses in rural India declined from 510 gms per day in 1991 to 436 gms per day in 2008, as per data furnished in the Economic Survey, Government of India, 2009-10. On the other hand, per capita monthly cereal consumption declined from 13.40 kg (NSSO, 50th Round, 1993-94) to 12.72 kg (NSSO, 55th Round, 1999-2000) in India within a span of 6 years. As per NSSO, 61st Round in 2004-05, the per capita monthly cereal consumption further declined to 12.12 kg in rural area. The same declining trend in per capita monthly cereal consumption was noticed in urban area also. It declined from 10.60 kg (NSSO, 50th Round, 1993-94) to 10.42 kg (NSSO, 55th Round, 1999-2000) and further to 9.94 kg (NSSO, 61st Round, 2004-05). Similar trend of decline in per capita monthly cereal consumption were noticeable in all the states of India. In view of the situation Prof. Abhijit Sen Committee had suggested that to achieve the target of cereals production to 260 million tonnes in 2020 from 219.21 million tonnes during 2008-09 (Economic Survey 2009-10, GoI), the productivity of agricultural land must be increased with quality inputs use.

On the other hand the Global Hunger Index (GHI) for India indicates continuing pressence of large-scale poverty and hunger in the country. Despite positive legislative provisions like NREGA and other remarkable policy initiatives like ICDS, Mid-day Meal, Public Distribution System and National Social Assistance Programmes etc. the country fails to meet this challenge.

Similarly, despite good record of food grains production in 1990s and poverty reduction through decentralization and previous land reforms, the State Hunger Index reflects an alarming situation of hunger in West Bengal. Under such a threat of hunger, West Bengal was destined to come under the coverage of NFSM since the inception of the programme (2007-08) for rice, wheat and pulses.

It is in this context of growing hunger and undernourishment coupled with existence of awful poverty in the agrarian sector of West Bengal, the present study derives its

significance. It is upon the primary survey based study to look into the performance of NFSM programme in enhancing the input use, productivity and income of the farmers.

1.4. Data and Methodology

The study on NFSM-Rice has been conducted based on the survey data collected from sample farmers in selected NFSM districts, viz. West Medinipur and Howrah of West Bengal. Questionnaire method was adopted in course of the primary survey conducted among treatment and control groups.

Apart from the primary data, secondary information with regard to area, production and yield of rice, wheat and pulses were analyzed for the district as well as the state level. The secondary data have been collected from the State Directorate of Agriculture.

Study area and sampling design

For the selection of study area and the beneficiary and non-beneficiary farmers, a multi-stage sampling design have been used (Flowchart 1).

District selection

At the first stage, two districts having NFSM rice programme for 2013-14 were selected in a manner so that one is having highest total production of rice (West Medinipur) and the other having lowest total production (Howrah).

Block selection

At the second stage, two Community Development blocks (CD blocks) have been selected from each district, based on proximity of its location from the district headquarter. One Community Development block located at a close vicinity (<5 kms) of the district HQ and the other at a distance of 15-20 kilometres from the district HQ. For this survey Medinipur Sadar and Debra have been selected as nearby and far-away blocks respectively from HQ of West Medinipur. On the other hand, Domjur have been selected as a nearby block and Amta I as a far-away block from district HQ in Howrah.

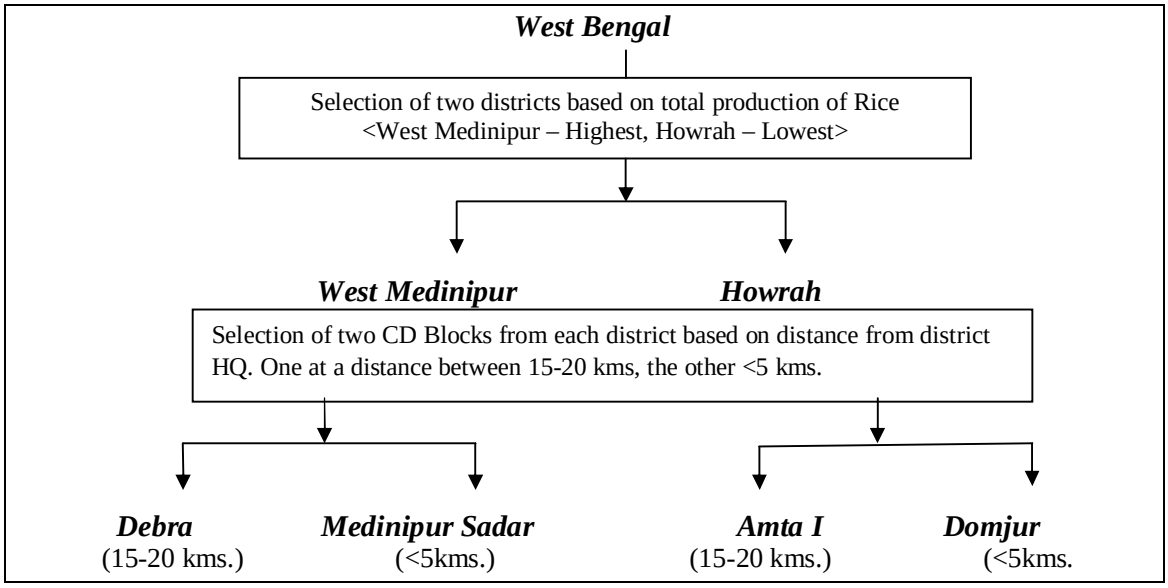
Farmers' selection

Subsequently, at the third stage, 75 beneficiary farmers and 25 non beneficiary farmers have been selected randomly from each Community Development block totaling to a

sample size of 300 beneficiary households and 100 non beneficiary households in the West Bengal state.

For the selection of beneficiary households in each block, the exhaustive beneficiary list was obtained from the Department of Agriculture at the block level. While collecting the list, an attempt has been made to identify the households who have obtained benefits of various components irrespective of the year of benefit. But it turned out that in the selected areas NFSM programme is being launched for the first year in 2013-14. As all the benefits have been given under crop development programme by seed, fertilizer, micro-nutrient, plant protection chemicals, etc. and cash in some cases to meet the labour payment for one year only, so selection of beneficiaries did not become possible with due representation of major components covered under the scheme. Beneficiaries as well as non-beneficiary sample farmers have been selected only giving proportionate representation to different size classes and various socio-economic characteristics of the households including gender concern.

Flowchart 1: Multistage sampling Method



Note: Stratified Random Sample of 75 beneficiary and 25 non-beneficiary households from each village with proportional allocation towards land operational size-classes, social and ethnic classifications i.e 100 household from each village summing up to a total sample of 400 HH

The selection of non-beneficiary households have been done in such a way that a similar cropping pattern and comparable baseline characteristics do get reflected among the non-beneficiary households as well.

Collection of data

The techniques used in data collection for this study were survey schedules, prepared for this specific study by the co-ordinator and personal interview method for primary and secondary data respectively.

Analytical tools

In order to fulfill the first objective of *analysing the trends in production, productivity of rice wheat and pulses in the NFSM and Non-NFSM districts in the West Bengal state*, secondary data on area, production and productivity of rice for 9^{th}, 10^{th} and 11^{th} FYP have been used. Compound growth rates, correlation and diagrammatical analysis have been applied using this secondary information.

For meeting the remaining objectives, primary household data have been considered. The primary data relating to general information about the sample farmers, socio-economic profiles, cropping pattern, details on various inputs used in paddy cultivation, irrigation details, yield, returns, reasons for adoption/non-adoption of NFSM interventions, constrains faced for availing the benefits, suggestions for improvement, etc., have been collected from the sample beneficiary and non-beneficiary farmers through personal interview method by using the structured survey schedule. The primary household data have been collected mainly pertaining to the agricultural year 2013-14 which is the latest agricultural year.

For fulfilling the requirement of the second objective (*To analyse the socio-economic profile of NFSM vis-a-vis Non-NFSM beneficiary farmers of rice*), third objective (*To assess the impact of NFSM on input use, production and income among the beneficiary farmers*) and fifth objective (*To identify the constraints hindering the performance of the programme*) descriptive statistics with tabular presentation have been applied.

In order to fulfill the fourth objective (*To identify factors influencing the adoption of major interventions (improved technologies) under NFSM*) logistic regression model was adopted.

1.5. Structure of the Report

The entire Study Report has been organized into six chapters including *Introduction* as 1^{st} Chapter. The 2^{nd} Chapter has been characterized by *Impact of NFSM on Food grains Production in the State - A Time Series Analysis. Household Characteristics, Cropping*

Pattern and Production Structure of this study based on available information has been included in the 3rd Chapter. *NFSM Interventions and its Impact on Farming* among the beneficiaries has been analyzed in the 4th Chapter. The 5th Chapter takes care of *Participation Decision, Constraints and Suggestions for Improvement of NFSM* under the present study. *Concluding Remarks and Policy Suggestion* is discussed in the 6th and final chapter.

1.6. Summary of the Chapter 1

1.6.1. During 1970s, the Green Revolution of Indian agriculture paved the way for food security in India with high growth in agricultural production and productivity. However, the programme had not succeeded in making India totally and permanently self-sufficient in food. In such a situation, the Government of India, Ministry of Agriculture has launched the National Food Security Mission (NFSM) since 2007- 08 in some selected areas of the country for increasing the production and productivity of rice, wheat and pulses only. The strategy for expansion of cultivated area was considered mainly for pulses and wheat, and productivity enhancement strategy was targeted mainly for rice.

It is in this context it becomes essential to evaluate and measure the extent to which the programme has been successful in achieving the desired goals. Hence, the specific objectives of the present study are:

6. To analyse the trends in area, production, productivity of rice in the NFSM districts in the West Bengal;
7. To analyse the socio-economic profile of NFSM vis-à-vis Non-NFSM beneficiary farmers of rice;
8. To assess the impact of NFSM on input use, production and income among the beneficiary farmers;
9. To identify factors influencing the adoption of major interventions (improved technologies) under NFSM; and
10. To identify the constraints hindering the performance of the programme.

1.6.2. The study on NFSM-Rice was conducted on the basis of survey data collected from sample farmers in selected NFSM districts, viz. West Medinipur (district having highest total production of rice) and Howrah (district having lowest total production of rice) of West Bengal. Not only the primary data, but the secondary data of this specific programme have also been used in this study. The secondary data have been collected from the State Directorate of Agriculture. At the second stage, two Community Development blocks (CD

blocks) have been selected from each district, drawing one Community Development block from the close vicinity (< 5 kms.) of district headquarters and the second at a distance of 15-20 kilometres from the district headquarter. Subsequently, at the third stage, 75 beneficiary farmers and 25 non beneficiary farmers have been selected randomly from each Community Development block with proportional allocation in respect of their operational size-classes and other socio-economic, ethnic and gender characteristics, totaling to a sample size of 300 beneficiary households and 100 non beneficiary households in the West Bengal.

1.6.3. In order to fulfill the first objective, secondary data on area, production and productivity of rice for 9th, 10th and 11th FYP have been used. Compound growth rates, correlation and diagrammatic analysis have been applied using this secondary information.

For fulfilling the requirement of the second objective, third objective and fifth objective descriptive statistics with tabular presentation have been applied.

In order to fulfill the fourth objective a logistic regression model was fitted.

1.6.4. The entire Study Report has been organized into six chapters including *Introduction* as 1st Chapter and the *Concluding Remarks and Policy Suggestion* of the emerging issues based on the findings of this study as 6th chapter.

CHAPTER 2
IMPACT OF NFSM ON FOODGRAINS PRODUCTION IN THE STATE – A TIME SERIES ANALYSIS

This chapter focuses on the performance of NFSM program in West Bengal over the plan periods. District wise secondary data on area, production and yield of rice, wheat and pulses have been taken into account for the purpose. Time series analysis was done to perceive the pattern of changes in this respect and to assess the impact of the programme on the said indicators. But prior to that let us have a quick glance towards the state of irrigation, net sown area, gross cropped area and fertilizer consumption over the plan periods.

2.1. Trends in Area and Input Use for Food Grain Crops:

Table 2.1: Trend in Area and Fertilizer Use – West Bengal

	YEAR		Net Irrigated Area (IN LAKH HECTERE)	Gross Irrigated Area (IN LAKH HECTERE)	Net Sown Area (IN LAKH HECTERE)	Gross Cropped Area (IN LAKH HECTERE)	% Net Irrigated to Net Sown Area	Irrigation Intensity (%)	Cropping Intensity (%)	Fertilizer Consumption (KG/HA)
WEST BENGAL	9TH PLAN	1997-98	19.11	24.91	54.64	92.59	34.97	26.90	169.45	105.34
		1998-99	19.11	24.91	54.40	92.90	35.13	26.81	170.77	116.03
		1999-00	19.11	24.91	54.72	95.45	34.92	26.10	174.43	133.77
		2000-01	23.54	33.69	54.17	91.17	43.46	36.95	168.30	116.79
		2001-02	30.58	54.26	55.22	97.79	55.38	55.49	177.09	123.43
	AVERAGE AGR		**13.27**	**24.08**	**0.27**	**1.46**	**12.93**	**22.19**	**1.16**	**4.61**
	10TH PLAN	2002-03	29.66	53.11	53.54	95.10	55.40	55.85	177.62	128.07
		2003-04	30.06	53.87	54.28	96.61	55.38	55.76	177.98	122.43
		2004-05	31.82	53.39	53.74	95.23	59.21	56.06	177.21	129.73
		2005-06	31.35	55.01	52.95	95.33	59.21	57.70	180.04	127.50
		2006-07	31.36	55.81	52.96	96.35	59.21	57.92	181.93	143.21
	AVERAGE AGR		**0.55**	**0.58**	**-0.82**	**-0.28**	**1.39**	**0.87**	**0.54**	**3.18**
	11TH PLAN	2007-08	31.36	56.69	52.96	97.52	59.21	58.13	184.14	140.97
		2008-09	31.35	56.51	52.94	98.02	59.22	57.65	185.15	155.79
		2009-10	31.12	55.25	52.56	95.30	59.21	57.97	181.32	168.64
		2010-11	29.55	51.94	49.81	88.32	59.33	58.81	177.31	164.93
		2011-12	30.78	54.37	51.98	93.53	59.22	58.13	179.93	169.70
	AVERAGE AGR		**-0.33**	**-0.46**	**-0.33**	**-0.49**	**0.00**	**0.08**	**-0.21**	**3.58**

Source: Ministry of Agriculture, Govt. Of India

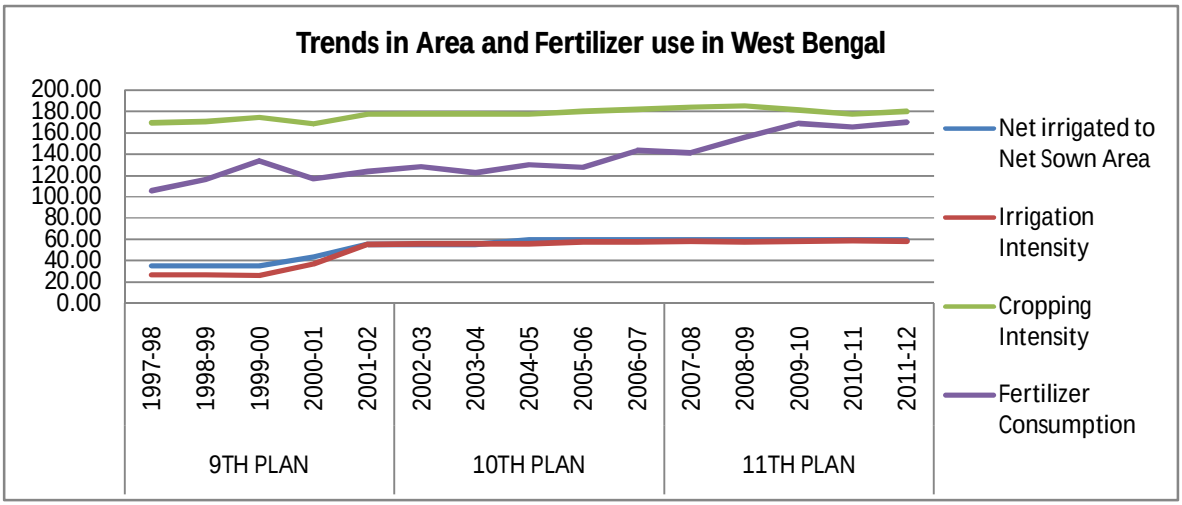
Table 2.1 suggests that both net and gross irrigated area experienced a sharp increase in a period of two years from 1999-00 to 2001-02. In this 9th plan, net irrigated area increased from 19.11 lakh ha to 30.58 lakh ha. Similarly, gross cropped area increased from 24.91 lakh ha to 54.26 lakh hectare in the same plan. But corresponding to this, in the 9th five year plan,

the net sown area has not increased over the time and the gross cropped area has shown the trend around 95.45 lakh hectares over the years.

In the next two plans, net irrigated, gross irrigated; net sown and the gross cropped area have remained more or less constant over the years. But during the 11th plan the gross cropped area has in fact declined from 95.30 lakh hectares in 2009-10 to 88.32 lakh hectares in 2010-11. However, during 2011-12 we observe an augmentation in GCA to the tune of 93.53 lakh hectares.

It is revealed that during the 9th plan the proportion of the net irrigated area was more or less one third of net sown area which increased to near about two third of the net sown area at the end of 11th plan (Table 2.1, Diagram 1). A rapid increase in the proportion of the net irrigated area was observed in the year 2000-01 and 2001-02 successively. The irrigation intensity too had also improved during the plan periods and experienced a sharp rise in 2000-01 and 2001-02. However since 2001-02 Irrigation Intensity has become constant over the year. But despite the fluctuations that took place in net irrigated area and irrigation intensity, cropping intensity, however, remained more or less constant over the three plan periods. Fertilizer consumption too, do reveal a steady increase over the years form 1997-98 to 2011-12.

Diagram 2.1:



Summarizing the facts from the above section, among the agricultural inputs, use of fertilizers showed an increasing trend over the year. The irrigated area has increased during the 9th plan and constant after that. Lastly, both net sown area and the gross cropped area remained same over the years and in the line diagram cropping intensity which seems to be

relatively constant around 180. Now the question is with the changes in the use of fertilizers and irrigated area how the area, production and productivity of rice, wheat and pulses are changing.

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

In the table 2.2 and 2.3, simultaneously, the productivity of paddy and wheat has shown an increasing trend over the plan periods. While the productivity of pulses remained same or showed little fluctuations over the plan.

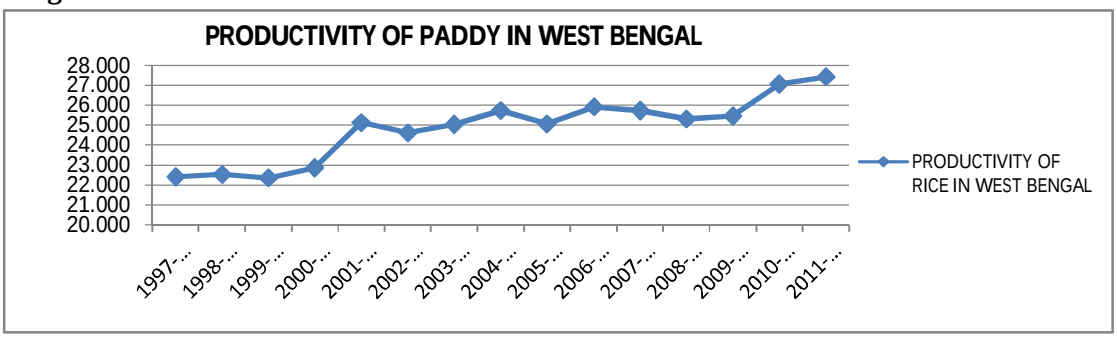
Table 2.2 and 2.3: Trends in Area, Production and Yield of Paddy, Wheat and Pulses- West Bengal

		YEAR	PADDY			WHEAT			PULSES		
			AREA (LAKH HA)	PRODUCTION (TONNES)	PRODUCTIVITY (Qtls/HA)	AREA (LAKH HA)	PRODUCTION (TONNES)	PRODUCTIVITY (Qtls/HA)	AREA (LAKH HA)	PRODUCTION (TONNES)	PRODUCTIVITY (Qtls/HA)
WEST BENGAL	9TH PLAN	1997-98	59.003	13236600	22.434	3.674	810500	22.060	2.219	152700	6.881
		1998-99	59.041	13316400	22.554	3.675	778100	21.173	2.037	126500	6.210
		1999-00	61.504	13759700	22.372	3.642	850800	23.361	2.141	141600	6.614
		2000-01	54.353	12428000	22.865	4.26	1058600	24.850	2.745	219500	7.996
		2001-02	60.691	15256700	25.138	4.34	961500	22.154	2.491	175100	7.029
		AVERAGE AGR	**1.068**	**4.254**	**2.969**	**4.494**	**5.149**	**0.459**	**3.965**	**7.391**	**1.389**
	10TH PLAN	2002-03	58.421	14389200	24.630	4.054	887400	21.889	2.418	167900	6.944
		2003-04	58.566	14662200	25.035	4.257	985700	23.155	2.519	211600	8.400
		2004-05	57.836	14884900	25.736	4.001	841500	21.032	2.264	167300	7.390
		2005-06	57.829	14510800	25.093	3.667	773500	21.094	2.226	174500	7.839
		2006-07	56.870	14745900	25.929	3.506	799900	22.815	2.196	154400	7.031
		AVERAGE AGR	**-1.282**	**-0.633**	**0.651**	**-4.067**	**-3.185**	**0.774**	**-2.381**	**-1.247**	**0.700**
	11TH PLAN	2007-08	57.198	14719500	25.734	3.526	917300	26.015	2.009	158000	7.865
		2008-09	59.357	15037240	25.334	3.06985	764528	24.904	1.84014	134227	7.294
		2009-10	56.301	14340605	25.471	3.15888	846657	26.802	1.82395	155229	8.511
		2010-11	49.441	13389610	27.082	3.16808	874415	27.601	1.9706	176522	8.958
		2011-12	54.327	14905770	27.437	3.1566	872900	27.653	1.677	119560	7.129
		AVERAGE AGR	**-0.620**	**0.408**	**1.174**	**-1.907**	**2.374**	**4.109**	**-4.932**	**-3.124**	**1.225**

Source: Statistical Abstract, 2001, 2005, 2008; Govt. of West Bengal

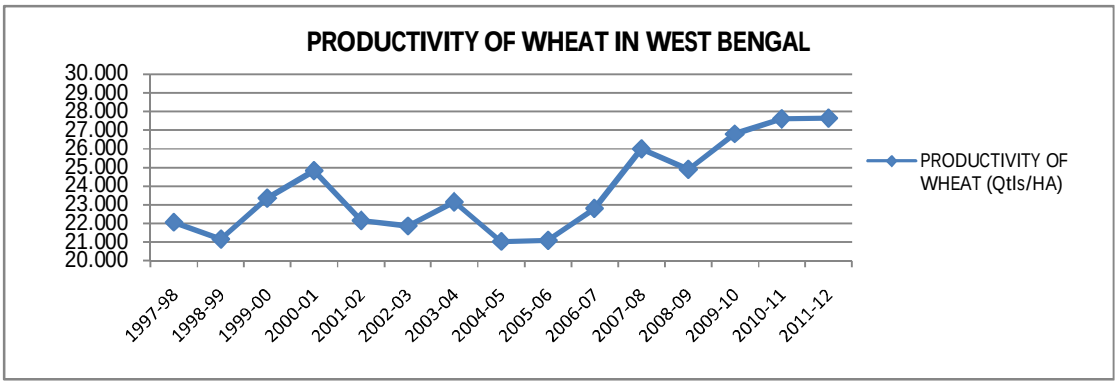
Over the first four years of the 9th plan productivity of paddy remained same. After 2000-01, the productivity seems to have increased to 25.13 quintal/hectare in 2001-02. It continues to be around 25 quintal/hectare till the year 2009-10 (i.e. 11th plan period) and in 2010-11 it increased to 27.08 quintal/hectare. The slow growth of productivity is observed over the plan periods (Diagram 2). However, towards the end of 11th plan (i.e. since 2010-11) productivity of paddy reveals a steady increment in comparison with the previous years.

Diagram 2.2:



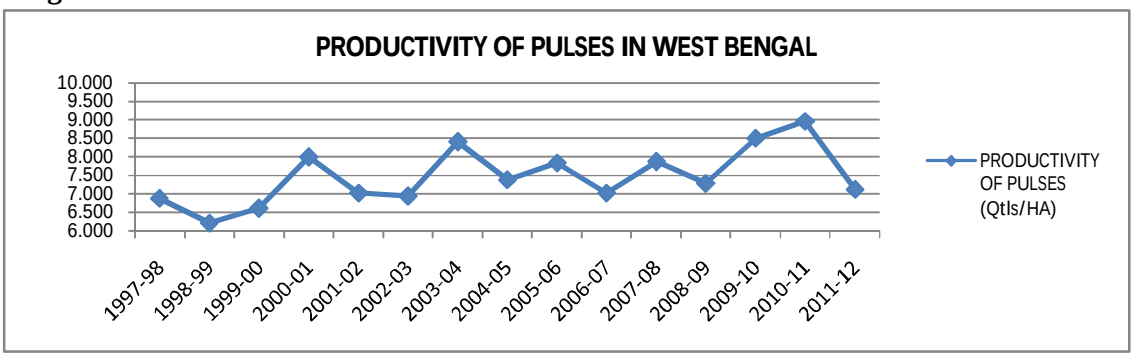
In case of wheat, the productivity showed fluctuations over the time till 2006-07. After that, the productivity increase was sudden from 22.82 qtls/ha in 2006-07 to 26.01 qtls/ha in 2007-08 and throughout the 11th plan the productivity of wheat on an average was 26.59 qtls/ha. This enhancement in productivity may be due to proper implementation of NFSM program and use of improved production techniques by the farmers. At the same time, the increase in irrigation facilities also may be the reason behind the enhancement of wheat productivity.

Diagram 2.3:



The productivity of pulses, on the other hand, reveals fluctuations throughout the plan periods. It can be seen from the diagram 4 in the year 2000-01, 2003-04 and 2010-11, the productivity of pulses increased sharply and in the following years registered a sharp decline. The average annual growth rate (AGR) of productivity of pulses in 11th plan is higher than the preceding 10th plan but it is lower than the 9th plan. So there seems to be no conclusive indications as to the impact of NFSM programme for pulses in augmenting its productivity.

Diagram 2.4:



2.3: Growth of Paddy, Wheat and Pulse Crops- Impact of NFSM (State)

Thus, from this section we may summarize that the production and productivity of rice and wheat in the 11th plan has shown a higher trend than the previous two plans and this might have been partially due to the incorporation of the NFSM program from 2007-08. Farmers' use of advance production techniques and increase in irrigation facilities to them may also be the reason behind the enhancement of the productivity of rice and wheat. Besides, pulses had shown fluctuations in productivity over the plan. The reach of the program at total fund allocation for pulses in west Bengal may not be sufficient and the district selection for allocation of fund was not fixed for pulses over the years in the program. This may indicate somehow the program was failed to bring impact on the productivity of pulses.

2.4. District Wise Growth of Paddy, Wheat and Pulse Crops and Impact of NFSM:

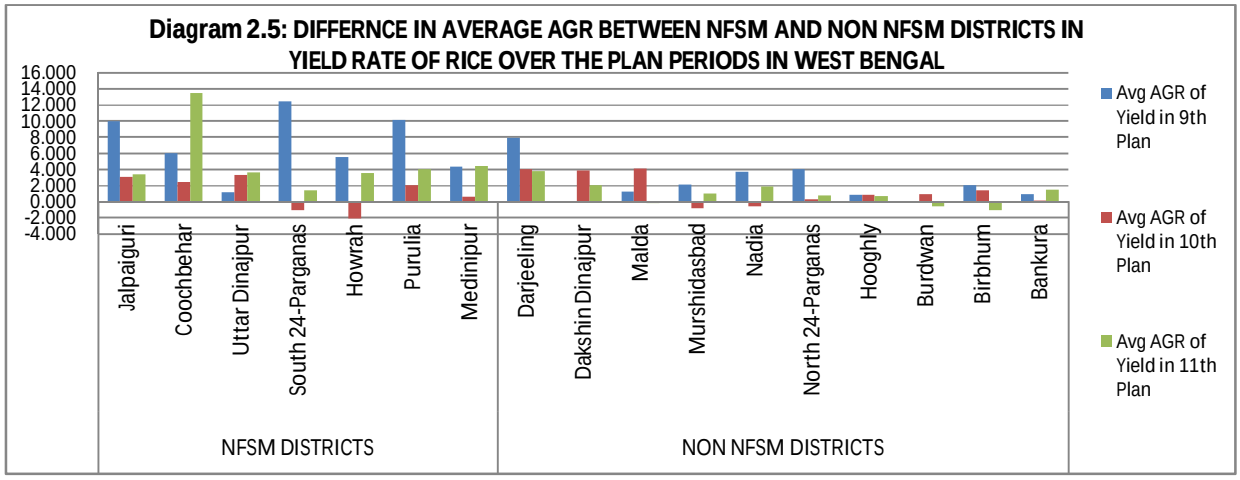
Now, to see more closely at disaggregate level we observe APY variation in districts with NFSM benefits vis-à-vis the non NFSM ones for all the three crops Rice, Wheat and Pulses.

In case of paddy, the mean growth rates of NFSM districts for productivity were higher than the non NFSM districts in the 9th plan. But during the 10th plan the mean growth rates of NFSM districts have declined more than that of the non NFSM districts. After that, in the 11th plan, mean growth rates of NFSM districts have increased again from the previous plan and became more than that of the non NFSM districts. It is found that the average annual growth rate of productivity was higher across the NFSM districts than the non NFSM districts during the 11th plan (diagram 5). This is an indication which is showing the introduction of the program from 2007-08 might be contributing towards increasing the productivity of rice during this period.

Table 2.4: Average AGR in Area, Production and Yield of Paddy in NFSM and Non-NFSM districts in West Bengal

PADDY										
		Average AGR in 9th plan			Average AGR in 10th plan			Average AGR in 11th plan		
		A	P	Y	A	P	Y	A	P	Y
NFSM DISTRICTS	Jalpaiguri	1.161	8.184	9.979	-1.877	0.687	3.053	-0.417	2.749	3.403
	Coochbehar	0.549	6.751	6.037	-2.808	-0.100	2.433	3.267	15.829	13.549
	Uttar Dinajpur	2.673	3.840	1.139	-1.544	1.933	3.245	-1.452	2.287	3.660
	South 24-Parganas	0.048	12.791	12.473	-0.523	-1.735	-1.098	-1.145	0.448	1.376
	Howrah	0.047	6.697	5.524	-0.744	-2.661	-2.100	-1.679	2.392	3.533
	Purulia	0.279	15.001	10.154	0.336	3.770	2.045	6.106	21.174	4.015
	Medinipur	0.191	4.675	4.326	0.879	1.619	0.581	-1.112	2.687	4.427
NON NFSM DISTRICTS	Darjeeling	0.426	11.278	7.900	-2.630	1.152	3.991	0.566	4.291	3.760
	Dakshin Dinajpur	0.595	0.120		-2.462	1.468	3.845	-0.260	1.851	1.981
	Malda	-2.035	-0.787	1.277	-5.376	-1.527	4.095	7.703	6.405	-0.143
	Murshidasbad	11.522	14.851	2.173	0.020	-0.774	-0.825	-1.714	-0.857	0.998
	Nadia	6.472	9.196	3.711	-5.976	-6.472	-0.629	0.630	2.658	1.825
	North 24-Parganas	2.994	8.188	4.010	-3.248	-3.048	0.235	-4.294	-3.697	0.703
	Hooghly	26.452	8.320	0.842	-0.750	0.115	0.867	-1.487	-0.802	0.663
	Burdwan	0.784	1.310	0.033	-0.514	0.439	0.931	-1.269	-1.803	-0.616
	Birbhum	2.912	6.480	2.089	-0.455	0.788	1.375	3.703	1.768	-1.107
	Bankura	0.525	1.899	0.940	-0.326	-0.422	0.109	7.200	11.919	1.460

Source: Statistical Abstract, 2001, 2005, 2008; Govt. of West Bengal



The mean growth rates of NFSM districts for the productivity of wheat has shown an increasing trend over the plans. Except for Coachbehar and Dakhsin Dinajpur, mean growth rates of the NFSM districts for productivity have increased in the 10th plan. But in the 11th plan mean growth rates has increased in the districts coachbehar and Dakshin Dinajpur from the previous plan. This may reveals that in the NFSM years condition of wheat productivity in NFSM districts has improved from the previous years (diagram 6). Though the mean growth rates of wheat productivity in the non NFSM districts was higher than the NFSM districts in all the three plans but the mean growth rate of productivity of non NFSM districts have declined over the plans. This may imply that due to the program the wheat productivity in the NFSM districts have increased over the plan.

Table 2.5: Average AGR in Area, Production and Yield of Wheat in NFSM and Non-NFSM districts in West Bengal

WHEAT										
		Average AGR in 9th plan			Average AGR in 10th plan			Average AGR in 11th plan		
		A	P	Y	A	P	Y	A	P	Y
NFSM DISTRICTS	Jalpaiguri	3.549	5.119	2.214	-8.922	-5.639	4.502	1.479	5.952	4.277
	Coochbehar	7.557	11.364	5.925	-12.409	-10.770	1.748	-2.494	3.685	3.952
	Uttar Dinajpur	8.468	7.579	-1.032	-2.055	2.365	4.414	1.471	2.021	0.093
	Dakshin Dinajpur	11.476	13.047	1.494	-1.068	-0.887	0.944	7.253	13.061	5.091
NON NFSM DISTRICTS	Darjeeling	-7.525	2.096	12.983	-5.840	-6.179	-1.061	-1.941	7.106	9.418
	Malda	3.190	1.314	0.447	-4.020	-2.245	0.179	0.537	4.365	3.448
	Murshidasbad	2.982	4.187	0.870	-1.822	-1.882	-0.177	-4.774	1.088	6.003
	Nadia	3.058	1.277	-2.239	-4.082	-1.948	2.281	-2.289	5.253	7.336
	North 24-Parganas	28.962	37.590	5.075	-10.540	-6.672	3.344	1.174	3.855	4.291
	South 24-Parganas	17.400	27.123	11.248	14.943	13.063	1.941	81.905	139.679	11.718
	Howrah	-0.208	47.024	26.957	63.667	29.889	2.125			
	Hooghly	10.521	27.976	9.824	23.576	44.933	5.496	16.680	28.715	2.531
	Burdwan	25.697	33.117	5.070	-6.897	-8.236	-0.317	15.691	21.330	1.943
	Birbhum	7.399	6.473	-1.006	3.236	3.364	0.277	0.892	0.831	-0.045
	Bankura	13.752	22.071	7.786	-9.538	-2.933	3.393	-12.154	-9.558	2.502
	Purulia	33.540	40.977	14.381	-5.492	0.196	0.212	10.322	15.522	5.320
	Medinipur	6.289	11.907	3.630	-12.360	-9.367	23.189	9.865	10.526	0.500

Source: Statistical Abstract, 2001, 2005, 2008; Govt. of West Bengal

Diagram 2.6:

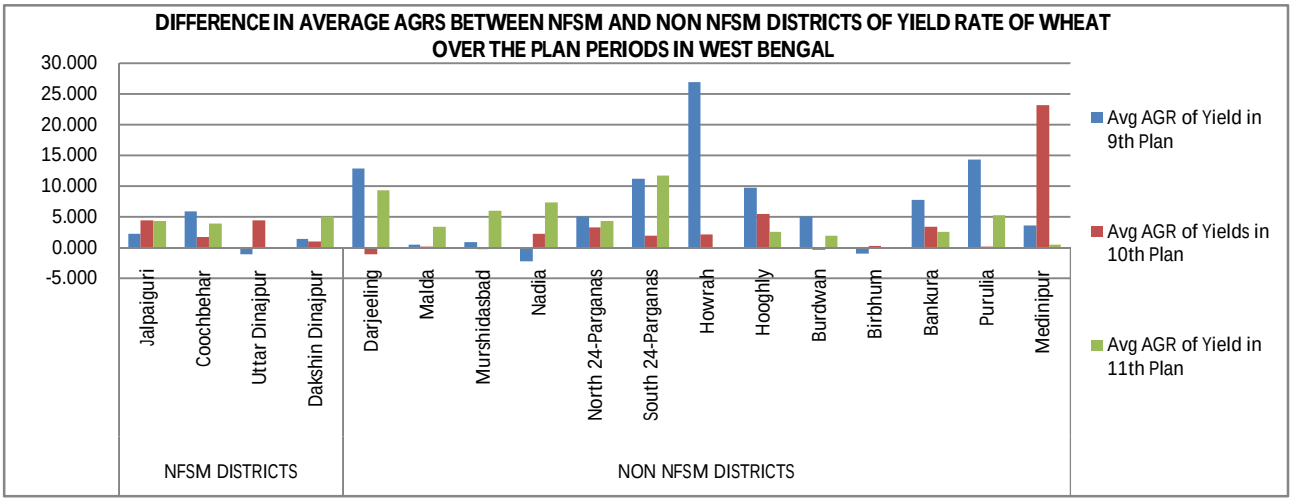
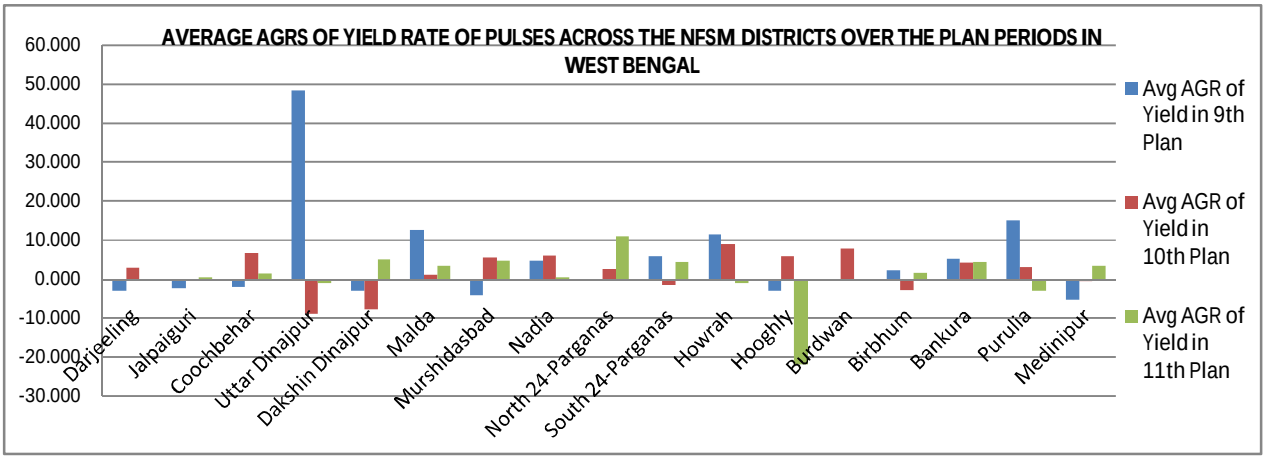


Table 2.6: Average AGR in Area, Production and Yield of Pulses in NFSM and Non-NFSM districts in West Bengal

PULSES										
		Average AGR in 9th plan			Average AGR in 10th plan			Average AGR in 11th plan		
		A	P	Y	A	P	Y	A	P	Y
NFSM DISTRICTS	Darjeeling	2.859	-0.651	-3.033	0.069	-0.905	2.999	-21.722	-21.422	-0.052
	Jalpaiguri	-10.752	-9.671	-2.274	3.272	4.015	0.082	-3.026	-1.713	0.559
	Coochbehar	12.597	4.921	-1.932	-3.768	4.047	6.729	-18.468	-16.063	1.513
	Uttar Dinajpur	-14.216	26.093	48.327	-6.518	-16.572	-8.854	-8.281	-0.696	-1.084
	Dakshin Dinajpur	-13.044	-16.757	-3.050	-20.027	-18.287	-7.579	12.857	13.585	5.127
	Malda	4.606	28.873	12.534	-2.752	-1.925	1.128	-6.165	-2.067	3.490
	Murshidasbad	6.325	4.042	-4.090	0.897	9.131	5.626	-3.629	1.151	4.746
	Nadia	14.271	16.155	4.739	-9.173	-2.603	6.080	5.792	6.134	0.544
	North 24-Parganas	0.896	4.656	-0.393	188.248	12.405	2.626	98.554	5.535	11.036
	South 24-Parganas	23.682	35.021	5.932	2.951	0.934	-1.450	0.974	8.717	4.357
	Howrah	-8.810	0.000	11.507	45.000	60.000	8.980	3.536	7.350	-1.051
	Hooghly	40.275	50.833	-3.044	52.098	68.768	5.883	-25.650	-19.165	-21.802
	Burdwan	-10.181	-2.237	-0.067	39.641	-13.658	7.906	9.673	21.042	-0.081
	Birbhum	18.894	17.636	2.158	2.875	0.971	-2.743	-5.921	-4.245	1.629
	Bankura	-15.199	-4.663	5.244	5.868	-6.667	4.267	-10.267	-6.036	4.305
	Purulia	-5.735	4.266	15.100	1.584	7.860	3.066	-6.044	-6.328	-3.026
	Medinipur	5.998	11.008	-5.159	2.602	4.446	-0.624	-12.762	-22.675	3.438

Source: Statistical Abstract, 2001, 2005, 2008; Govt. of West Bengal

Diagram 2.7:



In case of pulses, the benefits of the program have been provided to all the districts of West Bengal. In the 11th plan, 1st, 2nd and 4th year of the plan period, program has been implemented to only five districts. In the 3rd and fifth year of the plan period all the district of west Bengal has been covered under the NFSM program. The mean growth rates of productivity have declined over the plan, from 9th plan to 11th plan, in many districts. The mean growth rates of productivity of pulses in the districts of Darjeeling, Coachbehar, Murshidabad, Nadia, North 24 Paraganas, Hoogly and Burwan have increased from 9th to 10th plan. In the 11th plan, the districts of Jalpaiguri, Dakhsin Dinajpur, North 24 paraganas, South 24 Paraganas, Birbhum and Medinipur have shown increase in mean growth rates of Pulse productivity from previous plan. This may imply that the program has no remarkable

influence in augmenting the productivity of pulses during the 11th plan. From the above discussion it is noticed that the mean growth rates of productivity of rice were higher in NFSM districts than non NFSM districts during the 11th plan. In case of Wheat, the mean growth rates of its productivity in NFSM districts have increased over the plans. But the mean growth rates of pulses productivity for NFSM districts have declined during the 11th plan from the previous plans (i.e. 9th and 10th plan period). So, the program might have positive influence in increasing the productivity of rice and wheat. In the following sections, fund allocation of the government for successful implementation of the program has been noticed and its impact on productivity, irrigation, fertilizer etc.

2.5. Financial Progress under NFSM in the 11th & 12th FYP, Classification of Outlay and Expenditure by Districts and nature of interventions:

Table 2.7[1]: Financial Progress under NFSM in West Bengal

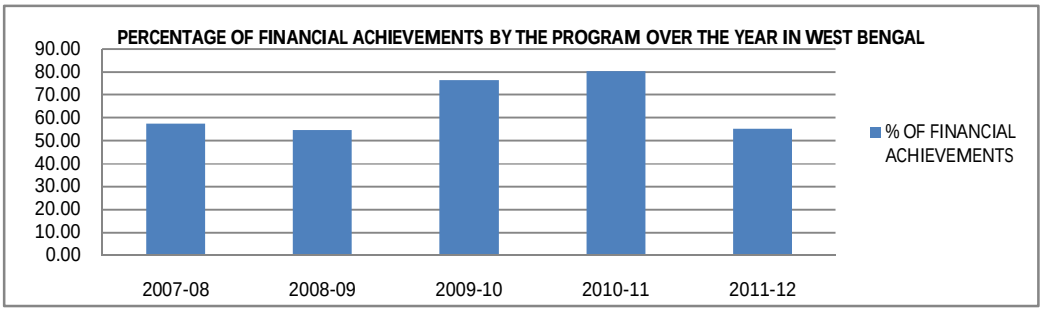
YEAR	TOTAL		
	FINANCIAL TARGETS (IN LAKH RS.)	FINANCIAL ACHIVEMENTS (EXPENDITURE) (IN LAKH RS.)	% OF ACHIVEMENTS
2007-08	1599.86	922.84	57.68
2008-09	7039.37	3853.32	54.74
2009-10	10053.28	7688.84	76.48
2010-11	6542.08	5260.21	80.41
2011-12	5693.14	3148.02	55.29
11TH PLAN AVERAGE AGR	**83.73**	**86.34**	**2.13**
2012-13	14839.52	11216.00	75.58
2013-14	18477.40	60.00	0.32

Source: http://www.nfsm.gov.in/nfmis/stateprofile/TS_State.aspx

It is observed that over the years from 2007-08 to 2010-11, the proportion of financial achievement has increased registering 80.41 per cent in 2010-11 (Table 2.7). After that in the year 2011-12 the percentage of achievement has declined. The average AGR of the expenditure in 11th FYP is more than that of the outlay and the average AGR of the percentage of achievement is around 2%. This indicates the increasing utilization of funds.

[1] The data of outlay and expenditure of NFSM program over the years for West Bengal been presented in the table 2.7 which have been collected from the NFSM official website. Others have been provided by State Directorate of Agriculture, West Bengal. There exits minor differences between the two sets as regards to the financial achievements. This difference is mainly because the cost of 'publicity, advertisement, A3P, etc. has not been included in the data provided by the Government of West Bengal. Due to the unavailability of district wise data of outlay and expenditure of the NFSM program in the NFSM official website we had to bank on the data made available by the State Directorate. District wise data relating to Outlay and Expenditure presented in table 2.8 have been collected from the State Agriculture Directorate.

Diagram 2.8:



The funds allocation procedure among the districts for successful implementation of NFSM is based on by and large the sanction and release of funds for NFSM by Government of India. The state administration has reported that they receipt funds in more or less due time from the Central Government. Similarly, most of the District level agencies have also been receiving their sanctioned funds in proper time. The overall position in respect of funds transfer by the State level agency to the District level agency was found to be satisfactory.

Table 2.7A: Fund allocation, release and utilization for rice crop in West Bengal

Crop	Year	Fund Allocation (Rs. in crore)	Fund Release (Rs. in crore)	Fund Release (in %)	Fund Utilization (Rs. in crore)	Fund Utilization (in %)
Rice	2007-08	6.09	6.09	100.00	5.95	97.70
	2008-09	49.02	47.53	96.96	29.06	61.14
	2009-10	72.02	51.82	71.95	57.29	110.55
	2010-11	49.04	24.80	50.57	40.23	162.22
	2011-12	40.84	30.63	75.00	25.60	83.58
	2012-13	103.28	28.40	27.50	74.07	260.80
	2013-14	126.44	24.86	19.66	0.60	2.41
Total		446.73	214.13	47.93	232.80	108.72

Source: Department of Agriculture, Govt. of WB

In accounts maintaining side, the state has opened separate bank account for the NFSM programme. Side by side, all the selected districts are maintaining agency-wise and activity-wise separate accounts and/or sub-accounts for the programme as per the guidelines issued under NFSM. At the district level also, all the transactions took place through nationalized banks. It has been reported that there is no any constraint in receipt of funds, even the procedures devised in the transfer of funds are simple and efficient.

A total fund of Rs. 446.73 crore was allocated for West Bengal from 2007-08 to 2013-14 by NFSM with reference to rice. But the amount released had been only Rs.214.13 crore (i.e. 47.93% of the total allocation). Despite too low release amount (less than 50% of allocated amount) the state has been able to utilize an amount of Rs.232.80 crore which is

8.72% higher than the released amount. This excess amount has been utilized from another agricultural programme of the state. This excess expenditure will be compensated after receiving the allotted NFSM fund from the Central Government. This is undoubtedly a good indicator on implementation perspective of NFSM for West Bengal (Table 2.7A).

District wise outlay and expenditure for the 11th plan period is presented in Table 2.8. For unknown reason, it is found that no fund has been allocated to the districts Derjeeling, North 24 Paraganas, Hoogly, Burdwan for the year 2007-08, 2008-09, 2009-10. After that funds were allocated to all those districts, except Darjeeling in the year 2010-11 and 2011-12.

Outlay and expenditure towards NFSM programme for all the districts in 2007-08 reveal a story of full utilization of funds (Table 2.8, Diagram 9). The highest allocation was received by Uttar Dinajpur and the minimum allocation was towards Malda and Birbhum. But in none of the districts the fund remained unutilized. But the scenario of fund utilization changed over the years. In 2008-09, the district outlay of funds was more than the expenditure incurred. It is noticed that the difference between outlay and expenditure was maximum in West Medinipur. In 2009-10, it seems that district outlays were increased, but the expenditures have increased more than that with respect to previous year. So, the gap between outlay and expenditure of the districts were reduced (figure 11). In the districts of Jalpaiguri, Howrah and Dakhsin Dinajpur the gap was very less compared to the other districts. In 2010-11, in maximum districts, the outlay and expenditure of fund was reduced (diagram 14 & 15). But in the districts of Howrah and Dakshin Dinajpur outlay of funds were increased. At the same time except Dakhsin Dinajpur expenditure was decreased in all the districts with respect to the previous year. Lastly, the expenditure was further reduced in all the districts except Malda, Murshidabad, Nadia and Birbhum in 2011-12. Whereas the outlay of funds for the districts of Purulia, West Medinipur, Malda, Murshidabad, Nadia, North 24 Paragana and Birbhum were increased from the previous year.

Table 2.8: District wise Outlay and Expenditure for the 11th FYP in West Bengal[2]

DISTRICTS	OUTLAY (IN LAKHS)					EXPENDITURE (IN LAKHS)				
	2007-08	2008-09	2009-10	2010-11	2011-12	2007-08	2008-09	2009-10	2010-11	2011-12
Jalpaiguri	101.42	612.39	858.60	675.26	621.83	101.42	368.47	854.88	656.70	419.32
Coochbehar	95.83	599.26	962.76	722.49	615.07	95.83	456.20	699.25	657.70	321.00
Uttar Dinajpur	155.09	622.83	1099.72	830.67	692.32	155.09	400.63	818.20	686.35	229.61
South 24-Parganas	92.03	809.13	873.81	689.98	381.82	92.03	553.28	580.62	286.88	30.25
Howrah	30.32	266.39	349.62	391.99	177.76	30.32	96.81	339.42	339.89	167.83
Purulia	78.08	616.65	1027.08	509.52	631.46	78.08	320.36	658.86	394.31	441.44
East Medinipur	93.09	691.51	1105.96	849.35	615.18	93.09	401.70	945.29	754.94	495.87
West Medinipur	146.64	1021.51	1748.90	927.93	1074.23	146.64	588.98	1563.70	858.88	680.01
Darjeeling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dakshin Dinajpur	29.58	53.73	119.27	183.76	165.74	29.58	17.24	119.27	139.21	62.21
Malda	20.10	278.54	294.82	51.54	75.64	20.10	0.00	189.29	28.42	35.79
Murshidasbad	35.22	413.21	619.11	70.96	117.85	35.22	294.87	513.91	38.18	56.42
Nadia	28.14	344.25	449.68	68.12	113.28	28.14	188.49	192.63	36.84	63.37
North 24-Parganas	0.00	0.00	0.00	18.06	24.80	0.00	0.00	0.00	16.86	9.99
Hooghly	0.00	0.00	0.00	6.08	3.23	0.00	0.00	0.00	6.08	1.23
Burdwan	0.00	0.00	0.00	13.92	8.31	0.00	0.00	0.00	13.56	4.11
Birbhum	16.55	187.89	264.42	44.89	69.23	16.55	160.03	170.34	20.30	41.34
Bankura	0.00	0.00	0.00	9.79	2.64	0.00	0.00	0.00	9.79	1.76

Source: Director of Agriculture, West Bengal

Diagram 2.9:

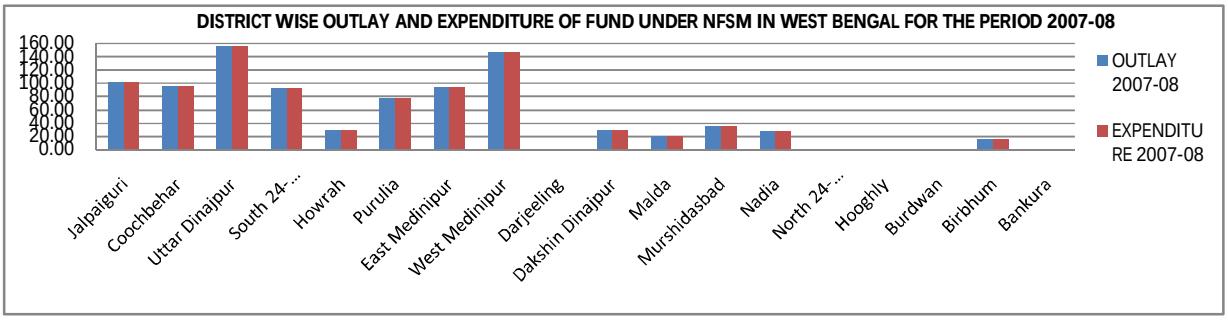
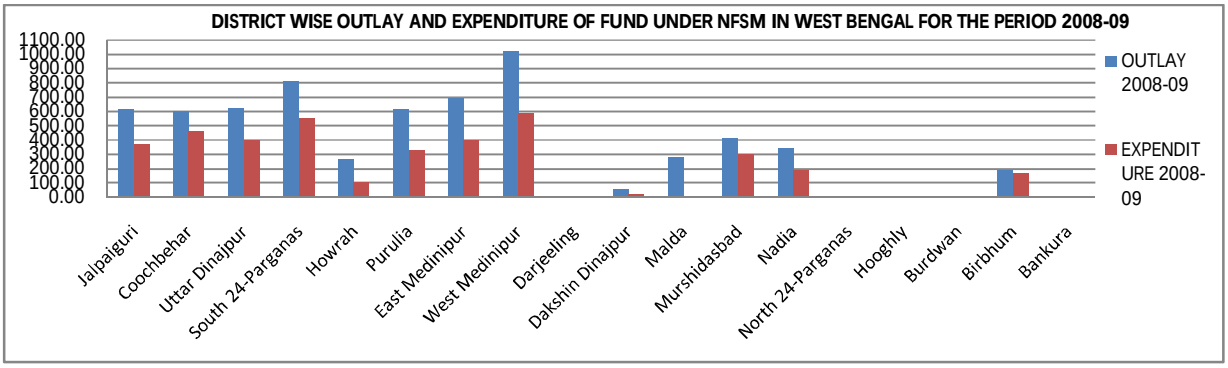


Diagram 2.10:



[2] The district wise data of NFSM outlay and Expenditure has been collected from Director of Agriculture, West Bengal Government, as because the data was not available from official website of NFSM. So, we had to rely on this data source for our analysis. Total figure by adding up the district wise data is slightly different from the data of West Bengal.

Diagram 2.11:

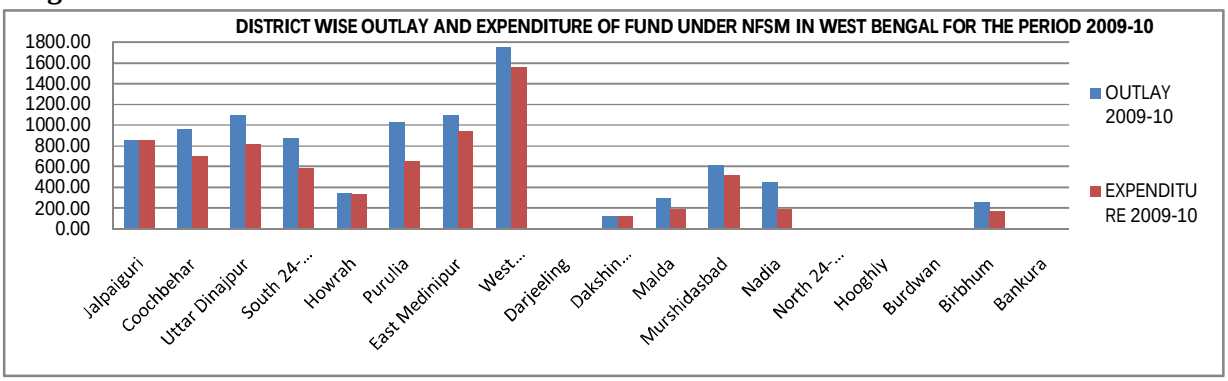


Diagram 2.12:

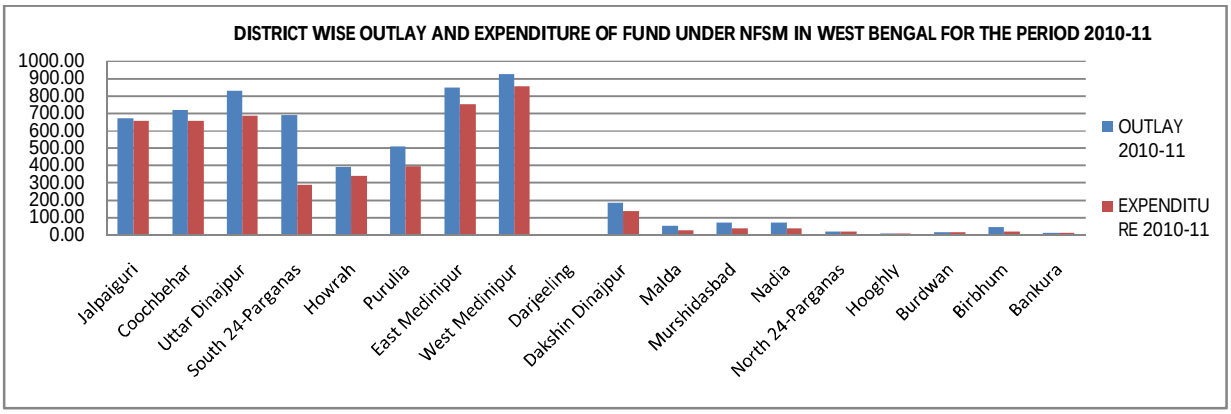


Diagram 2.13:

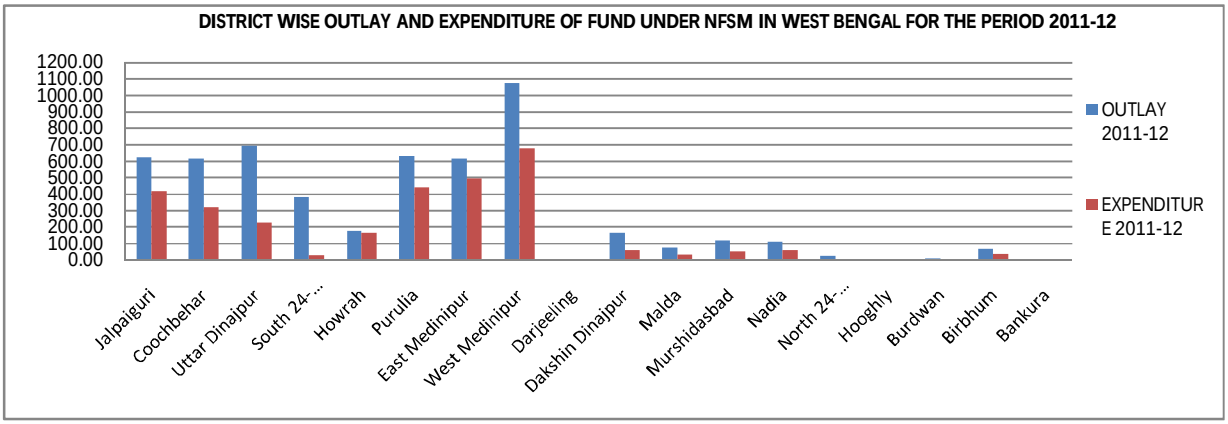


Diagram 2.14:

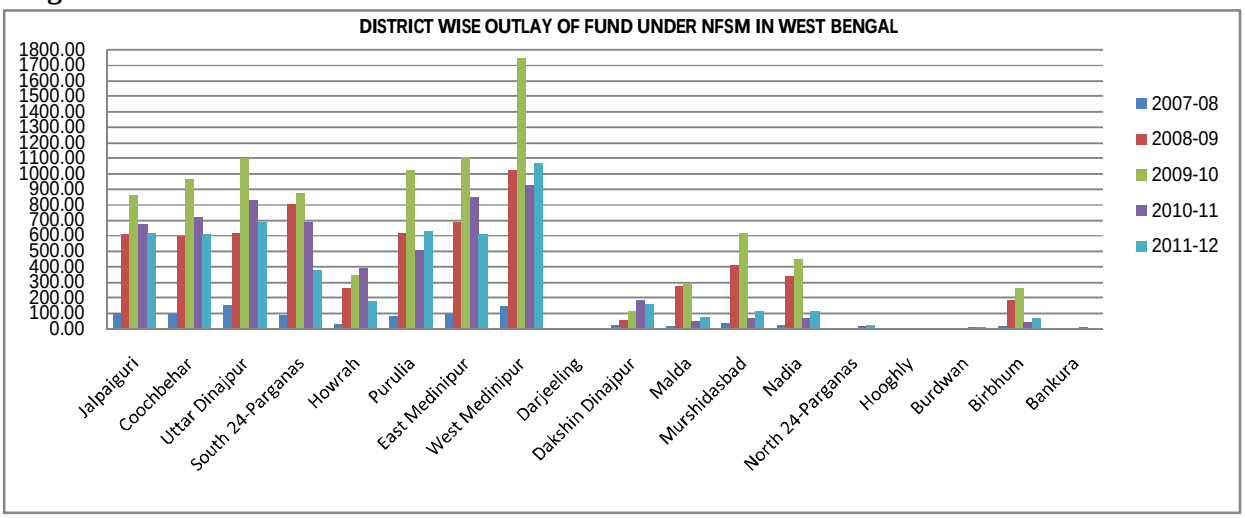
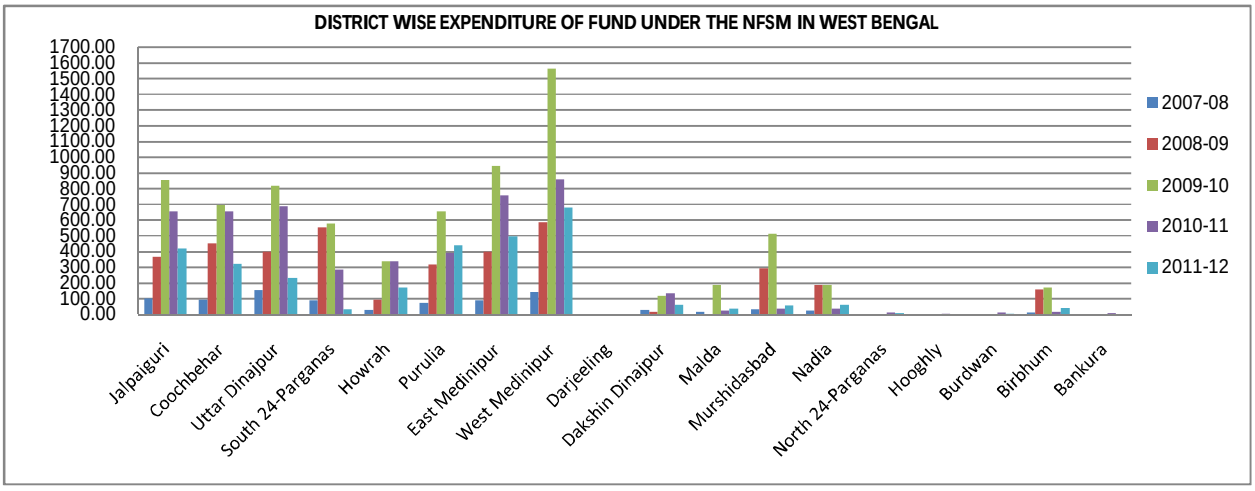


Diagram 2.15:



Summarizing the facts, due unknown reason, it is observed in five years the highest outlay of funds and expenditure has been incurred in the third year of NFSM (2009-10) in most of the districts. After that, in most districts outlay and expenditure of funds were reduced. However the percentage of achievements was increased in most of the districts. This might have indicates allotted funds were utilized more with respect to the time.

Apart from district wise allocation and utilization of fund under NFSM, we have also discussed about the financial targets and achievements with respect to the component categories of the programme in the following section. The outlays of funds for 'contingencies' and seed 'miniket' were nil (Table 2.9). For 'Administration' purpose in the first two years no fund was allocated and next three years Rs 15 lakh has been allocated for

each year. 'Training of the extensions' was done for first four years and average allocation for this purpose was 1.5 lakhs each year. Allocation of fund was done for two years regarding the 'publicity' of the program, i.e. in 2007-08 and 2009-10. Higher funds were allocated for Demonstrations, distribution, production subsidy, IPM, demonstrations, Micro Nutrients, Plant Protection Chemicals, Soil Amendments and water management than other categories. All these categories are falling under the broad category of **'Crop Demonstration'**. The percentage of allocation for **'crop demonstration'** was increased over the years out of the total allocation. It was 46.62% in 2007-08, then it was increased to around 73% in the following years 2008-09 and 2009-10 and it was further increased to 77.79% and 81.39% in the years 2010-11 and 2011-12 respectively.

The expenditure of funds were incurred for Administration, contingencies, Institution buildings, publicity and training of extension workers is very low or nil. Likewise the allocation higher expenditure of fund was incurred for the **'Crop Demonstration'**. Around 80% of the total expenditure was incurred for 'crop demonstration' in all the years except the year 2008-09. In the year 2008-09 around 70% of the expenditure was incurred for 'crop demonstration'.

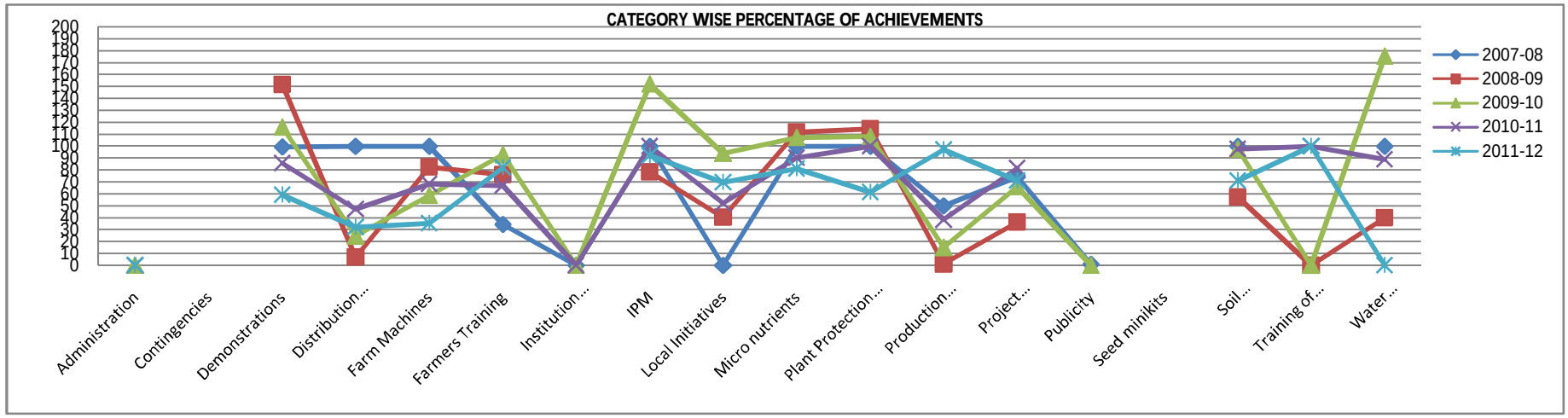
The figure shown above reflects that the percentage of achievements for Demonstration, IPM, Micro Nutrients, Plant Protection Chemicals and Soil amendments taken together was comparatively higher than other categories over the years. Moreover, the percentage of achievements in the categories like demonstration, IPM and micro were near optimum or optimum over the years.

Table 2.9: Category Wise Outlay and Expenditure for the 11th FYP in West Bengal (2007-08 to 2011-12)

CATEGORY WISE INTERVENTIONS	OUTLAY (RS IN LAKHS)					EXPENDITURE (RS IN LAKHS)					% OF ACHIEVEMENTS				
	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
Administration	0.00	0.00	15.00	15.00	15.00	0.00	0.00	0.00	0.00	0.00			0.00	0.00	0.00
Contingencies	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
Demonstrations	49.75	116.50	357.26	604.88	595.20	49.48	176.79	414.60	519.18	352.81	99.45	151.75	116.05	85.83	59.28
Distribution subsidy	51.62	1846.86	2625.00	715.00	652.00	51.62	128.50	647.76	339.01	209.42	100.00	6.96	24.68	47.41	32.12
Farm Machines	58.50	780.75	2060.25	811.50	477.30	58.50	644.66	1208.59	553.78	169.33	100.00	82.57	58.66	68.24	35.48
Farmers Training	76.35	141.10	165.75	139.74	79.90	26.35	107.17	153.85	93.81	65.60	34.51	75.96	92.82	67.13	82.10
Institution building	5.00	0.00	25.00	25.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	
IPM	9.00	431.57	225.00	18.00	37.50	9.00	337.74	341.91	18.00	34.53	100.00	78.26	151.96	100.00	92.08
Local Initiatives	500.00	806.00	340.00	315.00	340.00	0.00	326.36	319.28	164.08	236.69	0.00	40.49	93.91	52.09	69.61
Micro nutrients	340.00	715.00	1350.00	1360.00	1330.00	340.00	799.52	1448.37	1228.34	1079.37	100.00	111.82	107.29	90.32	81.16
Plant Protection chemicals	65.50	375.00	725.84	567.25	530.00	65.50	430.00	783.89	567.25	326.29	100.00	114.67	108.00	100.00	61.56
Production Subsidy	20.00	192.48	256.94	74.69	56.57	10.00	2.50	38.59	28.66	55.00	50.00	1.30	15.02	38.37	97.22
Project Management Teams	136.14	132.77	107.33	145.77	145.79	101.40	48.36	70.89	118.87	103.51	74.48	36.42	66.05	81.55	71.00
Publicity	78.00	0.00	49.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	1.28		0.00		
Seed minikits	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
Soil Amendments (Lime/Gypsum)	150.00	1436.85	1040.41	844.50	722.50	150.00	826.79	1017.02	824.49	512.66	100.00	57.54	97.75	97.63	70.96
Training of Extension workers	0.00	2.00	2.00	1.00	1.00	0.00	0.00	0.00	1.00	1.00		0.00	0.00	100.00	100.00
Water Management	60.00	62.50	708.50	904.75	710.38	60.00	24.92	1244.08	803.74	1.81	100.00	39.88	175.59	88.84	0.25

Source: http://www.nfsm.gov.in/nfmis/stateprofile/TA_Intervention.aspx

Diagram 2.16:



2.6. Correlation between Per cent Change in NFSM Expenditure and per cent Change in Seeds, Fertilizer Consumption, Irrigated Area, Area and Production of Paddy, Wheat and Pulses:

Changes in the expenditure of NFSM program over the time may influence the changes in the area and production of rice, wheat and pulses. It might have also relations with the changes in the use of fertilizer and irrigated area. With the help of correlation this probable relations can be seen. So, in the following section we would do correlation with these variables by using STATA 8.2.

Table 2.10 shows the percentage change in Total NFSM expenditure, the percentage change of net irrigated area and percentage change in fertilizer consumption over the years from 2008-09 to 2011-12. No significant correlation is observed between the percentage change of total NFSM expenditure and the percentage change in net irrigated area or percentage change of fertilizer consumption. The significance tests have been done at the 10 per cent level. So no conclusive evidence of their relation was marked.

Table 2.10: Correlation between Percentage Change in NFSM Expenditure and Irrigation / Fertilizer in West Bengal

	% Change Total NFSM Expenditure	% Change of Net Irrigated Area	% Change of Fertilizer
	NFSM_EXP	NET_IRRI_A	CH_FERT
change over 2008-09	-5.10	-0.03	10.51
change over 2009-10	39.72	-0.73	8.25
change over 2010-11	5.13	-5.04	-2.20
change over 2011-12	-31.23	4.16	2.89
Correlation Coefficient	-0.5458	0.2616	0.3848
% Change Total NFSM Expenditure	1		
% Change of Net Irrigated Area	-0.5458	1	
% Change of Fertilizer	0.2616	0.3848	1

Moreover, the percentage change in area and production of rice, wheat and pulses (Table 2.11) do not reveal any significant correlation with the percentage change in total NFSM expenditure.

Table 2.11: Correlation between NFSM Expenditure and Area and Production of Paddy, Wheat and Pulses in West Bengal

	% Change Total NFSM Expenditure	% change of Area of Rice	% change of production of Rice	% change of Area of Wheat	% change of production of Wheat	% change of Area of Pulses	% change of production of Pulses
	NFSM_EXP	Rice_ChA	Rice_ChP	Wheat_ChA	Wheat_ChP	Pulses_ChA	Pulses_ChP
change over 2008-09	-5.10	3.77	2.16	-12.94	-16.65	-8.41	-15.05
change over 2009-10	39.72	-5.15	-4.63	2.90	10.74	-0.88	15.65
change over 2010-11	5.13	-12.18	-6.63	0.29	3.28	8.04	13.72
change over 2011-12	-31.23	9.88	11.32	-0.36	-0.17	-14.90	-32.27
Correlation Coefficient		-0.6855	-0.8226	0.3453	0.5295	0.6305	0.8863
% Change Total NFSM Expenditure	1						
% change of Area of Rice	-0.6855	1					
% change of production of Rice	-0.8226	0.9592*	1				
% change of Area of Wheat	0.3453	-0.3881	-0.2425	1			
% change of production of Wheat	0.5295	-0.4814	-0.3834	0.9786*	1		
% change of Area of Pulses	0.6305	-0.9968*	-0.9454*	0.3484	0.4321	1	
% change of production of Pulses	0.8863	-0.9442*	-0.9758*	0.4259	0.5661	0.9165*	1

2.7. Summary of the Chapter 2:

2.7.1. The use of fertilizers showed an increasing trend over the year. The irrigated area has increased during the 9th plan and constant after that. Both the net sown and the gross cropped area remained same over the years and the cropping intensity which seems to be relatively constant around 180 over the year.

2.7.2. The production and productivity of rice and wheat in the 11th plan has shown a higher trend than the previous two plans and this might have been partially due to the incorporation of the NFSM program from 2007-08. Besides, pulses had shown fluctuations in productivity over the plan. This may indicate somehow the program was failed to bring impact on the productivity of pulses.

2.7.3. At the disaggregate level, the mean growth rates of productivity of rice were higher in NFSM districts than non NFSM districts during the 11th plan. In case of Wheat, the mean growth rates of its productivity in NFSM districts have increased over the plans. But the mean growth rates of pulses productivity for NFSM districts have declined during the 11th

plan from the previous plans (i.e. 9th and 10th plan period). The program might have positive influence in increasing the productivity of rice and wheat

2.7.4. It is observed that over the years from 2007-08 to 2010-11, the proportion of financial achievement has increased registering 80.41 per cent in 2010-11 (Table 2.7). After that in the year 2011-12 the percentage of achievement has declined. The highest expenditure and outlay for the program has been incurred in the year 2012-2013. But the target and expenditure of funds have declined in the year 2010-11 and 2011-12 with respect to 2009-10.

2.7.5. It is observed in five years the highest outlay of funds and expenditure has been incurred in the third year of NFSM (2009-10) in most of the districts. After that, in most districts outlay and expenditure of funds were reduced. However the percentage of achievements was increased in most of the districts. This might have indicates allotted funds were utilized more with respect to the time.

2.7.6. We have discussed about the financial targets and achievements with respect to the component categories of the programme. Higher funds were allocated for Demonstrations, distribution, production subsidy, IPM, demonstrations, Micro Nutrients, Plant Protection Chemicals, Soil Amendments and water management than other categories. All these categories are falling under the broad category of **'Crop Demonstration'** and the percentage of allocation for **'crop demonstration'** was increased over the years out of the total allocation. Likewise the allocation higher expenditure of fund was incurred for the **'Crop Demonstration'**. Around 80% of the total expenditure was incurred for 'crop demonstration' in all the years except the year 2008-09.

2.7.7. Lastly, the percentage change of NFSM expenditure has shown no significant relation with the percentage change in net irrigated areas, percentage change in the use of fertilizer, percentage change in area and production of rice, wheat and pulses.

CHAPTER 3
HOUSEHOLD CHARACTERISTICS, CROPPING PATTERN AND PRODUCTION STRUCTURE

3.1. Socio-economic Profile of Sample HHs

The socio-economic characteristics of the sample farmers would provide the background information and resource endowment position of the farmers in the selected area. This includes the information about the details of family members with gender and education, caste status, occupational income from agriculture and other sources, size of land holding and net operated area of the sample households. These factors are crucial for bringing about desirable changes in the farm economy. It is therefore essential to get acquainted with these factors. However, before we go through the details about those factors, it seems worthwhile to mention the size of family and the number of efficient working members of the sample farm households in the study area.

Sample Size and its distribution

The present study has been carried out with the sample size comprises of 300 rice beneficiary farmers and 100 non-beneficiary farmers to serve as control group, selected at the rate of 75 beneficiaries and 25 non-beneficiary rice growing farmers from each of the selected two blocks of each of the two rice growing NFSM districts of West Bengal State covered under the programme of the National Food Security Mission (NFSM). The average family size of the selected household is 5.0 and 5.4 for beneficiary and non-beneficiary respectively (Table 3.1).

It is also evident from the investigation that average percentage of members engaged in farming in both beneficiary and non-beneficiary farm family is 32.98 and 32.53 respectively. The important point may be underlined here that around 33% members to the total members of each selected family was farmer by profession. Thus, the number of farmer-members was almost same in both the farmer categories in absolute term. This was because of small family size in both the farmers' group. The farm business and farm income of the family would depend on the number of active farm workers in the family as well as size of the family. Greater availability of active workers in the farm family would induce farm holdings to use crop-mixes and / or intensive use of land in the form of multi-cropping (measured by the ratio of gross cropped area to net cropped area i.e. cropping intensity) such that he derives a higher gross yield per unit of his holding. In fact a basic premise underlying

the explanation of a higher degree of labour use on small sized holdings refers to the greater availability of family labour relative to land on such holdings (labour is interpreted as worker). Again, family human labour is a major source of labour required for carry out timely all type of farming operations and other allied activities. The extent of availability of family human labour directly impacts the paid out cost of cultivation. The availability of family human labour is directly related to the size and composition of family and number of active workers in the family. Thus the information regarding average family size of sample households and the availability of active workers are collected and presented in Table 3.1 for discussion.

It has been found that 92% of the sample farmers are male and 8% female in the beneficiary farmer category. The non-beneficiary sample farmers contain the gender data of 99% male and 1% female only. It has also been observed during the survey that the percentage of male and female of above 15 years old and the children of below 15 years old are almost same for beneficiary and non-beneficiary households. The recorded percentages are 41.26 and 41.22 for male, 38.52 and 37.52 for female and 20.23 and 21.16 for children of beneficiary and non-beneficiary households respectively.

In respect of educational status, it is evident from the enquiry that about half of the beneficiaries are either illiterate or obtain education equal to primary level. Around 30% of the respondents (35.33% from beneficiary group and 31.00% from non-beneficiary group) have obtained education equal to middle level. Only 8% and 9% respondents have obtained matriculation degree and 4.00% and 5.00% respondents have got their higher secondary degree from beneficiary and non-beneficiary categories respectively. Graduation or diploma level of education has been obtained by 2.00 and 3.00 percent beneficiaries and non-beneficiaries respectively of the selected respondents and only 0.67% beneficiary respondent have acquired above graduation/degree level of education.

The information regarding caste category depicts that the percentage of farmers of general group is maximum by 53.33% and 60.00%, followed by 40.67% and 34.00% farmers from schedule caste (SC) category, 5.33% and 6.00% from OBC and 0.67% and 0.00% from ST category in the beneficiary and non-beneficiary sample households respectively, across the study area.

Details of family income

To understand the socio-economic status, i.e. social position and economic condition of the sample families in the study area, an attempt has been undertaken to estimate the annual income of these families. It is well accepted that family income is the absolute scale to measure the economic viability of a family. Again, the source / sources of that income partially focused on the social status of that family.

With this view, the average annual family income from agriculture, business, salaried job, wages and other mainly agriculture allied sources of both beneficiary and non-beneficiary sample farm households in the study area have been worked out.

Average annual family income

The estimated results of annual family income reveal that the average annual family income of beneficiary farmers is lower than average annual family income of non-beneficiary farmers in the study area. The overall average annual family income from all sources of the sample households is Rs. 31730.59 for beneficiary farmers, whereas it is Rs. 32538.93 for non-beneficiary farmers in the study area. Thus, there is a higher annual family income of Rs. 808.34 for non-beneficiary farm family over beneficiary farm family (Table 3.1).

The important point may have to be noted here that, under the beneficiary farms, Rs. 22166.09 come annually from only agriculture income source out of average total annual family income of Rs. 31730.59. This meant that almost 70% of the family income comes from agriculture income source for beneficiary farmers. The non-beneficiary farmers earn Rs. 24177.63 from only agriculture income source and their average total annual family income is Rs. 32538.93. This is the counterpart of 74.33% of annual family income. This income of NFSM household (Rs. 22166.09) includes income from all crop enterprises including the NFSM part. At the same time the average size of the operated holding turned out to be marginally higher in case of non-NFSM farmers. It might have contributed towards slightly higher annual return (Rs. 24177.63) from agriculture. However, the discussion has focused on the aspect that agriculture is the earning source of almost 70 % and 74.33 % of the average annual family income for beneficiary and non-beneficiary sample households, respectively. So, we conclude that all the sample households in the study area are primarily farmers by profession.

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

Characteristics			NFSM	Non-NFSM
Total households Surveyed: numbers			300	100
Household size: number			5.0	5.4
% of HH members engaged in farming			32.98	32.53
Gender of the Respondent (%)		Male	92.00	99.00
		Female	8.00	1.00
Age group of the members (%)		Male > 15	41.26	41.22
		Female > 15	38.52	37.52
		Children < 15	20.23	21.26
Education status of the family members (%)		Illiterate	22.33	22.00
		Primary	27.67	30.00
		Middle	35.33	31.00
		Matri/Sec	8.00	9.00
		HS	4.00	5.00
		Degree/Dip	2.00	3.00
		Above Degree	0.67	0.00
Caste of households (%)		SC	40.67	34.00
		ST	0.67	0.00
		OBC	5.33	6.00
		General	53.33	60.00
Occupational income (Rs./annum/HH)		Only agriculture	22166.09 (300)	24177.63 (100)
		Own business	19878.38 (37)	26863.64 (11)
		Salaried / pensioners	24050.00 (10)	30500.00 (3)
		Wage earners	11728.26 (46)	10454.55 (11)
Occupational income (Rs./annum/HH) Others*		Diary	10119.05 (21)	11176.00 (5)
		Poultry	14000.00 (4)	29250.00 (4)
		Fishery	13500.00 (2)	8500.00 (2)
		Floriculture	21167.00 (50)	24041.67 (6)
		Average annual income from all sources	31730.59	32538.93
Net operated area	% of area	Marginal (0.1 to 2.50 ac)	77.6	72.5
		Small (2.51 to 5.0 ac)	8.0	22.5
		Medium (5.1 to 10.0 ac)	14.4	5.0
		Large (10.1 and above)	-	-
	% of holdings	Marginal (0.1 to 2.50 ac)	95.3	91.0
		Small (2.51 to 5.0 ac)	2.7	8.0
		Medium (5.1 to 10.0 ac)	2.0	1.0
		Large (10.1 and above)	-	-
	Average size	Total (acres)	1.01	1.19

* Income from others includes *Diary, Poultry, Fishery* and *Floriculture*** Figures in parenthesis indicates number of HH

Net operated area

In the study area, 77.6% of the operated area occupied by marginal farmers which is 95.3% of the total operated holdings, followed by medium farmers (14.4% area & 2.0% holdings) & small farmers (8.0% area & 2.7% holdings) for the beneficiary group. On the other hand, 72.5% operated area and 91.0% operated holdings are under the control of marginal farmers followed by 22.5% area and 8.0% holdings are under the small farmers and 5.0% area and 1.0% holdings are under medium farmers for the non-beneficiary group. The percentage of area signifies the proportion of area under crop enterprises by the different categories of farmer. And the percentage of operated holdings is the proportion of holdings being operated by different size class categories of farmers, i.e. marginal, small and medium. No large farm exists in both beneficiary and non-beneficiary group of farmers. In course of discussion with land holdings, it appears that the average sizes of land holdings of the selected farm households across the study area are 1.01 acres and 1.19 acres for beneficiary and non-beneficiary groups respectively. So, it is evident from this information that the study areas are predominant by the marginal farmers (Table 3.1).

3.2. Characteristics of Operational Holdings

The total own land of the sample beneficiary farmers has been worked out as 256.81 acres. Out of this own land 250.44 acres have been considered as cultivable land. There are 55.56 acres leased-in and 2.50 acres leased-out land for beneficiary farmers. Thus, net operated area is 303.50 acres (cultivated own-250.45 plus leased-in 55.56 minus leased-out2.50), which resulted 1.01 acres net operated area and 0.86 acre owned land area per beneficiary household across the study area. On the other hand, the calculated total own land of the sample non-beneficiary farmers is 115.23 acres. They have 6.51 acres un-cultivated land, 12.43 acres leased-in land and 2.07 acres of land has been leased-out by them. Thus, the samples non-beneficiaries have total net operated area of 119.08 acres resulting 1.19 acres net operated area and 1.15 acres own land per household across the study area (Table 3.2).

Another estimates point out that the cropping intensity (194.22%) in the sample beneficiary farms is higher than the cropping intensity (192.73%) in the sample non-beneficiary farms. Table 3.2 also describe that the irrigation intensity is 196.43% and 198.72% for beneficiary and non-beneficiary farms respectively. So, it is evident from the figures of both, cropping and irrigation intensity that the intensive crop cultivation has been done during the reference year under available irrigation facility.

Table 3.2: Characteristics of operational holdings of sample HH (in acres)

Land Details	**NFSM**	**Non-NFSM**
1. Total owned land	256.81	115.23
2. Un-cultivated land / Fallow land	6.37	6.51
3. Cultivable land (Own)	250.44	108.72
4. Leased-in land	55.56	12.43
5. Leased-out land	2.50	2.07
6. Net Operated Area (3+4-5)	303.50	119.08
Gross Cropped Area	**589.56**	**229.52**
7. Cropping Intensity(%) = (GCA/NCA)*100	194.22	192.73
8. Irrigation Intensity (%) = (GIA/NIA)*100	196.43	198.72
9. Net operated area per HH	1.01	1.19
10. Total owned land per HH	0.86	1.15

**Cropping Intensity = (Gross Cropped Area / Net Cropped Area)*100*
***Irrigation Intensity = (Gross Irrigated Area / Net Irrigated Area)*100*

3.3. Sources of Irrigation and Structure of Tenancy

It has been observed from the Table 3.3 that about 97% area of the beneficiary farmers and 94% of non-beneficiary farmers have the irrigation facilities. Only tube-well is the main source of irrigation of the beneficiary farmers as it covers 45.31% of the net operated area followed by only canal covering 39.22% of the net operated area. In the counterpart, main source of irrigation is only canal followed by only tube-well. The non-beneficiary farmers use canal water and tube-well water for irrigating 47.27% & 42.80% of their net operated area respectively. Apart from these two sources of irrigation (only canal & only tube-well), the next important sources of irrigation with 10.11% of the net operated area of beneficiary farmers and 3.65% of the net operated area of non-beneficiary farmers is canal plus tube-well. Tank as a source of water are being used by the beneficiary farmers in 2.67% of the net operated area. But only 0.04% of the net operated area is irrigated from tank by the non-beneficiary farmers.

However, in the light of the above discussion there is no confusion that almost the entire study area has assured irrigation potentiality, as 97% and 94% of the net operated area of beneficiary and non-beneficiary farms respectively has facility for obtaining irrigation. So, we may conclude that the study area is suitable for growing paddy since the supply of water in required amount is important during panicle initiation to flowering stage of the paddy crop.

Structure of Tenancy

The structure of tenancy for cultivation in leased-in and leased-out land has been described in Table 3.4. The said table depicts that among the beneficiary farmers those are cultivating in leased-in and leased-out land, 40.21% and 28.00% farmers maintain the condition of share cropping for leased-in and leased-out land respectively. Under another terms & conditions prevails in the study area, 55.80% farmers pay fixed rent in cash of Rs.8612.12 per acre for leased-in land and 72.00% farmers receive fixed rent in cash of Rs.3825.00 per acre for their leased-out land. Not only the payment by cash, but the study areas recognize the payment in kinds also for leased-in and leased-out land. It has been observed during the survey that 4.00% farmers pay for leased-in land by kinds @ 8.04 qtls. per acre as fixed rent (Table 3.4).

Table 3.3: Distribution of Area by Source of Irrigation (% to the total area)

Land Details	**NFSM**	**Non-NFSM**
Only Canal	119.05 (39.22)	56.29 (47.27)
Only Tubewell (Electric / Diesel)	137.52 (45.31)	50.97 (42.80)
Canal+Tubewell (Electric / Diesel)	30.67 (10.11)	4.34 (3.65)
Tank & Others (Open well)	8.11 (2.67)	0.05 (0.04)
Rainfed area	8.16 (2.69)	7.43 (6.24)
Total Irrigated Area per HH (acres)	0.98 (97.03)	1.12 (94.12)
Total Rainfed Area per HH (acres)	0.03 (2.97)	0.07 (5.88)

**Figures in the parenthesis indicate percentage to the total*

On the other side, among the non-beneficiary farmers those are cultivating in leased-in and leased-out land, 29.53% farmers for cultivating leased-in land and 19.32% farmers for cultivating leased-out land exchange a portion of their production with their counterpart. Apart from this system, 63.48% farmers pay fixed rent in cash of Rs. 8835.29 per acre for leased-in land and 80.68% farmers receive fixed rent in cash of Rs.3500.00 per acre for leased-out land. Side by side, 7.00% farmers pay fixed rent by kinds @ 8.53 qtls. per acre. (Table 3.4)

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	40.21	28.00	29.53	19.32
Fixed rent in cash*	55.80 (8612.12)	72.00 (3825.00)	63.48 (8835.29)	80.68 (3500.00)
Fixed rent in kind#	4.00 (8.04)	0.00	7.00 (8.53)	0.00
Aggregate	100.00	100.00	100.00	100.00

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

The important point is to be noted here that the amount of cash as fixed rent per acre and quantity of kinds as fixed rent per acre for leased-in and leased-out land are almost same for beneficiary and non-beneficiary farmers across the study area. In fact, these are the rates of the area for leased-in and leased-out land and the rates have not been impacted by NFSM programme as well as NFSM benefits.

3.4. Cropping Pattern and per acre Costs and Returns

The cropping pattern indicates the proportion of area under various crops at a point of time in a unit area. In other words, it indicates the yearly sequence and spatial arrangements of crops in an area. The objective of an efficient cropping pattern is to increase production from unit area of limited land resources in a year. An efficient cropping pattern is designed based on climate, soil and availability of water for realizing the potential production levels through efficient use of available resources. An appropriate cropping pattern should provide enough food for the family, fodder for cattle and generate sufficient cash income for domestic and cultivation expenses. This objective could be achieved by adopting intensive cropping methods. Methods of intensive cropping include multiple cropping and intercropping. Thus, the cropping pattern is an important component of any farming system. So, an attempt has been taken to understand the cropping pattern, the proportion of area under each crop to the gross cropped area including costs and returns involved to it in the study area.

Cropping Pattern

The Table 3.5 exhibits the area under various crops grown across the study area and the proportion of area under various crops to the gross cropped area. It has been observed during the study that the crops those are grown in the study area fall in the four major categories, namely, cereals, pulses, Oilseeds and others.

Cereals

Rice is the only crop from cereals cultivated widely in the study area. Not only that, it is the main as well as principal cultivated crop across the study area by occupying 83.05% and 90.77% to the gross cropped area in beneficiary and non-beneficiary farms respectively. Out of total 589.56 acres gross cultivated area in beneficiary farms, rice has been cultivated in 489.64 acres area. In case of non-beneficiary farms, rice has been grown in 208.33 acres area against total gross cropped area of 229.52 acres. (Table 3.5)

Pulses

Black gram, Lentil and Moong are the three cultivated crops in the study area consist of the pulse group. But the acreages under these crops are too low. Black gram has been cultivated only in 0.09% of the gross cropped area of non-beneficiary farms. In the same way, the acreage allotments under lentil and moong crops are also very poor. Only 0.10% and 0.07% area of the total gross cropped area have been allotted for growing lentil and moong in NFSM beneficiary farms. The important point to be under lined here is that black gram has been cultivated only in non-beneficiary farms and lentil and moong have been cultivated in beneficiary farms only.

Oilseeds

The picture of oilseeds cultivation, in respect of area, is something better than the area under pulses. Oilseeds have been grown in both beneficiary and non-beneficiary farms. In beneficiary farms, three oilseeds crops, namely, groundnut, mustard and sesame have been grown in 0.74%, 0.68% and 3.76% area respectively to the total gross cropped area. In case of non-beneficiary farms, groundnut, mustard and sesame have been grown in areas of 0.21, 1.18 and 2.98 acres respectively, which are lower than same crops of beneficiary farms.

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

Name of the Crop	Area			% of GCA	
	NFSM	Non-NFSM	Total	NFSM	Non-NFSM
Cereals					
Rice	489.64	208.33	697.97	83.05	90.77
Pulses					
Black gram	0.00	0.21	0.21	0.00	0.09
Lentil	0.59	0.00	0.59	0.10	0.00
Moong	0.39	0.00	0.39	0.07	0.00
Oilseeds					
Groundnut	4.36	0.21	4.57	0.74	0.09
Mustard	3.98	1.18	5.16	0.68	0.51
Sesame	22.14	2.98	25.12	3.76	1.30
Others					
Jute	13.18	0.66	13.84	2.24	0.29
Vegetables	10.22	9.48	19.70	1.73	4.13
Banana	1.17	0.00	1.17	0.20	0.00
Flower	16.58	1.53	18.11	2.81	0.67
Potato	27.31	4.94	32.25	4.63	2.15
GCA	**589.56**	**229.52**	**819.08**	**100.00**	**100.00**

Others

Other cultivated crops of the study area include jute, vegetables, banana, flower and potato. Among these crops, banana has only been cultivated in beneficiary farms in a small piece (total 1.17 acres only) of land. Remaining four crops have been cultivated in both beneficiary and non-beneficiary farms. Despite higher acreages allotment under cultivation of jute, vegetables, flower and potato in beneficiary farms (total 67.29 acres in beneficiary farms and total 16.61 acres in non-beneficiary farms), the percentage of cultivated area to total gross cropped area is lower for vegetables in beneficiary farms (1.73%) than non-beneficiary farms (4.13%). This happens due to higher gross cultivated area in beneficiary farms than non-beneficiary farms. (Table 3.5)

However, in the light of the above discussion, it is clear that area is predominant by rice cultivation. So the selection of this area for NFSM_Rice Programme is appropriate.

Household Income

To understand the total household income from both agricultural and non-agricultural sources of the sample families in the study area, an attempt has been undertaken to estimate

the annual net farm income per household including income from per acre of cultivated land of these families.

With this view, the average annual family income, average annual farm income and percentage of farm income over annual family income of both beneficiary and non-beneficiary sample farm households in the study area have been worked out.

The estimated results of annual family income reveal that the average annual family income of beneficiary farms is lower than average annual family income of non-beneficiary farms in the study area. But an opposite scene has been observed in income from per acre cultivated land. The overall average annual family income of the sample households is Rs. 31730.59 for beneficiary farms, whereas it is Rs. 32538.93 for non-beneficiary farms in the study area. Thus, there is a higher annual family income of Rs. 808.34 for non-beneficiary farm family over beneficiary farm family. It is also evident from this table that the income from non-farm sources is higher (Rs. 9564.50) in beneficiary families than income from non-farm sources (Rs. 8361.30) of non-beneficiary families. Perhaps the reason is lower cultivated acreages of beneficiary families than non-beneficiary families. (Table 3.6.a)

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)	62480.74	61760.20	65753.84	55218.21
Cost of Production	40314.65	39849.74	41576.20	34914.51
Net returns (value of output- cost of production)	22166.09 (69.86)	21910.47	24177.63 (74.30)	20303.69
Non-farm Income	9564.50 (30.14)	-	8361.30 (25.70)	-
Total Income	31730.59	31364.67	32538.93	27325.27

**Figures in parenthesis indicate percentage to the total*

Average annual farm income

The important point may have to be noted here that, under the beneficiary farms, Rs. 22166.09 come annually from farm income source and the non-beneficiary farmers earn Rs. 24177.63 from farm income source. Thus a higher amount by Rs. 2011.54 was earned by non-beneficiary households over the earning of beneficiary households from farming sources. But net income from per acre land cultivation of beneficiary and non-beneficiary farms was Rs. 21910.47 and Rs. 20303.69 respectively. The estimation indicates higher earning of beneficiary farms by Rs. 1606.78 over the non-beneficiary farms from per acre land

cultivation. So, we may conclude that technical guidance and inputs supply under NFSM_Rice programme in the study area impacted to the earning from unit area of land of sample beneficiary households. (Table 3.6.a)

Crop wise per acre costs and returns

The crop wise profitability of both beneficiary and non-beneficiary farms can be judged by studying the net farm income. It is calculated by subtracting cost of cultivation per acre from the value of gross production per acre. Table 3.6.(b) provides crop-wise data on differential net farm income between beneficiary and non-beneficiary farms.

It is evident from the estimation of comparative economics of crop cultivation between beneficiary and non-beneficiary farms that gross as well as net farm incomes for all the crops in beneficiary farms are not same, except paddy, than their non-beneficiary counterpart. The gross and net return of paddy in beneficiary and non-beneficiary field are Rs.26130.53, Rs. 26180.24 and Rs. 7887.35, Rs.7955.84 respectively. It is similar in case of mustard and sesame too. But groundnut, however, depicts different picture. Despite higher cost of cultivation, the calculated gross as well as net income from groundnut cultivation is higher for beneficiary farms than non-beneficiary farms.

Among the other crops, some interesting points have been observed. In case of jute cultivation, non-beneficiary farmers go to the higher expense for per acre cultivation and they get higher gross as well as net return than beneficiary farmers. But in the vegetable field, despite higher expenses incurred, lower net return has been received by beneficiary farmers than non-beneficiary farmers. Again flower and potato cultivation provide a higher net return for non-beneficiary famers, though they spent comparatively lower amount of rupees for these crop cultivation than beneficiary farmers. (Table 3.6.b).

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

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								
Rice	18.45	26130.53	18243.18	7887.35	18.34	26180.24	18224.40	7955.84
Pulses								
Black gram	-	-	-	-	5.00	20107.14	14761.90	5345.24
Lentil	9.32	45772.03	14915.25	30856.78	-	-	-	-
Moong	3.05	21517.95	14230.77	7287.18	-	-	-	-
Oilseeds								
Groundnut	4.93	15814.79	8767.20	7047.59	4.29	12000.00	6571.43	5428.57
Mustard	3.81	11416.58	5168.34	6248.24	3.79	11433.14	5720.34	5712.80
Sesame	1.63	6353.32	2074.30	4279.02	1.66	6502.01	2281.88	4220.13
Others								
Jute	8.54	18723.67	15949.92	2773.75	9.70	21333.33	17878.79	3454.55
Vegetables	35.88	62568.54	23942.27	38626.27	22.77	52032.49	12248.95	39783.54
Banana	38.97	27282.05	18461.54	8820.51	-	-	-	-
Flower*	6708.16	158097.10	92002.41	66094.69	4520.92	148398.69	54117.65	94281.05
Potato	93.30	77620.65	38111.50	39509.15	84.86	70292.71	26757.09	43535.63

*** Yield in stick per acre**

In the light of the above discussion it may be concluded that lower net farm income as well as net profit is primarily the result of higher cost of cultivation, except groundnut and jute. Higher investment provides higher net return from cultivation of these two crops. However, comparatively lower net return from the cultivation of a number of crops is perhaps the outcome of non-adoption or ignorance of scientific farming process with good quality inputs in appropriate quantity. Scientific method of different crops cultivation based on regional requirement should be followed. Organic process in crop cultivation in respect of soil health management, insect-pest and disease control and judicious application of micro-nutrient based on soil testing report may provide a scope to reduce the cost of cultivation of different crops.

3.5. Assets Holdings

Ownership of agricultural implements by the selected farmers does not reveal an encouraging picture. It is evident that only 5.33% and 3.33% beneficiary farmers and only 5% non-beneficiary farmers have costly implements namely, Tractor and Electric Pumpset respectively and only 2% beneficiary farmers have Power Tiller (Table 3.7). Diesel pump sets are owned by 27% beneficiary farmers and 18% non-beneficiary farmers. These exhaust the list of improved farm implements owned by the farming families.

Of course, there are a number of low cost farm implements with the sample farmers in the study area. For example, the most important low cost farm implements that are used in their farm operations are Sprayer (Knapsack) and Thresher (Paddy). Among the sample farmers, 82.33% beneficiary and 87% non-beneficiary farmers have Knapsack Sprayers. Again, 71.67% beneficiary and 71% non-beneficiary farmers are owners of Paddy Thresher.

This discussion points towards the resource scarcity of the selected sample farmers in the study area. In fact, it is the indication of the economic condition of the farmers' society in the state of West Bengal. As per latest census report, there are 82.16% marginal and 13.76% small farmers (*Agricultural Statistics at a Glance 2013*), totaling to an overwhelming figure of over 95 per cent in the agrarian West Bengal. The study area is more or less a replica of the state in respect of existing number of marginal and small farmers. These poor farmers are not capable of purchasing costly farm implements of their requirement. (Table 3.7)

Table 3.7: Farm assets holding by sample HHs.

Equipment code	Implements	NFSM		Non-NFSM	
		No.	Value (Rs.)	No.	Value (Rs.)
Land development, tillage and seed bed preparation equipments (1 & 2)					
1	Tractor/Mini Tractor/Trolley	16	1169500	5	470000
2	Power Tiller	6	610000	-	-
Plant protection equipments (3 & 4)					
3	Sprayers	247	183190	87	58145
4	Weeder	-	-	-	-
Harvesting and threshing equipments (5)					
5	Thresher	215	733100	71	258250
Equipments for residue management (6)					
6	Crusher	-	-	-	-
Post harvest and agro-processing machines (7 & 8)					
7	Chopper	-	-	-	-
8	Rice / Flour Mills	-	-	-	-
Water lifting implements (9 to 11)					
9	Electric Pumpset	10	1097377	-	-
10	Diesel Pumpset	81	678306	18	172674
11	Sprinkler	-	-	-	-
Others (12 to 14)					
12	Bullock cart	2	130000	2	40000
13	Farm house	17	660408	3	177840
14	Others (Spade, Sickle, etc.)	17	8950	24	13950
Grand Total		611	5270831	210	1190859

3.6. Sources and Purpose of Credit

Sources of Credit

Among various sources of credit for farm operation and requirement for some other activities, only the Commercial Bank and Primary Agricultural Credit Society (PACS) have played more or less significant role for sanctioning loan to the sample farmers. The table 3.8 depicts that 24.7% and 19% beneficiary and non-beneficiary farmers respectively have got loan from Commercial Bank. The Primary Agricultural Credit Society (PACS) has sanctioned loan for 14% beneficiary farmers and 6% non-beneficiary farmers. Other sources like, Government

Agencies, Intermediaries, Self Help Group (SHG), Non-Government Organization (NGO), etc do not play remarkable role for sanctioning loan to the selected sample farmers.

However, it is also evident from the Table 3.8 that the outstanding amount of loan per household is not so higher. This may be the cause of either lower requirement of loan or credit provider is not much interested to give loan to the marginal and small farmers.

Table 3.8: Details of source of credit by the sample HHs

Source of Credit	NFSM		Non NFSM	
	No. of HH of the total in %	**Outstanding amount (Rs/hh)**	**No. of HH of the total in %**	**Outstanding amount (Rs/hh)**
1.Commercial Bank	24.7	28865.42	19	39565.05
2.PACS	14.0	7211.40	6	5300.00
3.Govt. Agencies	0.7	21700.00		
4.Intermediaries	0.7	25000.00	1	0.00
5.Others (SHG, etc)	1.0	11766.67	1	8000.00
Total	41.0	20874.96	27	30022.97

* Calculated on the basis of indebted households under respective B & NB category

Purpose of Credit

Having known the amount of outstanding loan of the selected sample farmers, an attempt has been undertaken to know the purpose of credit. It is evident from the Table 3.9 that maximum amount has been borrowed for housing purpose (Rs. 135000/-) followed by business (Rs. 24000/-) and agriculture (Rs. 20704.31) purposes by the beneficiary farmers. On the other hand, the non-beneficiary farmers have borrowed only for agriculture purpose by the amount of Rs. 30592.59.

Table 3.9: Details of Purposes of Credit by the sample HHs (Rs/HH)

	TOTAL CREDIT/HH*	
Purpose	NFSM	Non NFSM
Productive uses	Rs./HH	Rs./HH
Agriculture	20704.31	30592.59
Business	24000.00	-
Total	**20840.50**	**30592.59**
Non Productive uses		
Housing	135000.00	-
Total	**135000.00**	**-**

So, we may conclude from the above discussion that despite prime importance on agriculture loan by the non-beneficiary farmers, beneficiary farmers give priority to borrow money for their housing purpose. Perhaps the marginal and small beneficiary farmers have no scope to gather comparatively huge amount at a time for constructing a house of their own. So they approach the loan providing agencies.

3.7. Summary of the Chapter 3

3.7.1. The average size of the selected household is 5.0 and 5.4 for beneficiary and non-beneficiary respectively. The average percentage of members engaged in farming in both beneficiary and non-beneficiary farm family is 32.98 and 32.53 respectively. It has been found that 92% of the sample farmers are male and 8% female in the beneficiary farmer category and 99% male and 1% female in the non-beneficiary farmer category. The percentage of male and female of above 15 years old and the children of below 15 years old are almost same for beneficiary and non-beneficiary households. In respect of educational status, about half of the members of the selected households are either illiterate or obtain primary level education. Around 30% of the members (35.33% from beneficiary group and 31.00% from non-beneficiary group) have obtained middle level education. Only 8% and 9% members have obtained matriculation degree and 4.00% and 5.00% members have got their higher secondary degree from beneficiary and non-beneficiary families respectively. Graduation or diploma level of education has been obtained by 2.00 and 3.00 percent members of the selected households and only 0.67% members of the beneficiary families have acquired above graduation/degree level of education. According to caste category information, 53.33% and 60.00% are general category, followed by 40.67% and 34.00% farmers from schedule caste (SC) category, 5.33% and 6.00% from OBC and 0.67% and 0.00% from ST category in the beneficiary and non-beneficiary sample households respectively, across the study area. The overall average annual family income from all sources of the sample households is Rs. 31730.59 for beneficiary farmers, whereas it is Rs. 32538.93 for non-beneficiary farmers in the study area. Thus, there is a higher annual family income of Rs. 808.34 for non-beneficiary farm family over beneficiary farm family. However, agriculture is the earning source of almost 70 % and 74.33 % of the average annual family income for beneficiary and non-beneficiary sample households respectively. So, we conclude that all the sample households in the study area are primarily farmers by profession. There are 77.6% of the operated area occupied by marginal farmers, followed by medium farmers (14.4% area) & small farmers (8.0% area) of the beneficiary group and 72.5% operated area are under the control of marginal farmers followed by 22.5% area under small farmers and 5.0% area under medium farmers for the non-beneficiary group. No large farm exists in both beneficiary and non-beneficiary group of farmers.

3.7.2. The total cultivated own land of the sample beneficiary farmers are 250.44 acres. There are 55.56 acres leased-in and 2.50 acres leased-out land for beneficiary farmers.

Thus, net operated area is 303.50 acres (cultivated own-250.45 plus leased-in 55.56 minus leased-out2.50), which resulted 1.01 acres net operated area per beneficiary household across the study area. On the other hand, the sample non-beneficiaries have total net operated area of 119.08 acres resulting 1.19 acres net operated area per household across the study area. Another estimates point out that the cropping intensity (194.22%) in the sample beneficiary farms is higher than the cropping intensity (192.73%) in the sample non-beneficiary farms and the irrigation intensity is 196.43% and 198.72% for beneficiary and non-beneficiary farms respectively. So, it may conclude that intensive crop cultivation under assured irrigation facility has been done by the sample farmers across the study area.

3.7.3. Only tube-well is the main source of irrigation of the beneficiary farmers as it covers 45.31% of the net operated area followed by only canal covering 39.22% of the net operated area. The non-beneficiary farmers use canal water and tube-well water for irrigating 47.27% & 42.80% of their net operated area respectively. However, almost the entire study area has assured irrigation potentiality, as 97% and 94% of the net operated area of beneficiary and non-beneficiary farms respectively has facility for obtaining irrigation. So, we may conclude that the study area is suitable for growing paddy since the supply of water in required amount is important during panicle initiation to flowering stage of the paddy crop.

Among the beneficiary farmers those were cultivating in leased-in and leased-out land, 40.21% and 28.00% farmers maintain the condition of share cropping for leased-in and leased-out land respectively. Under another terms & conditions prevails in the study area, 55.80% farmers pay fixed rent in cash of Rs.8612.12 per acre for leased-in land and 72.00% farmers receive fixed rent in cash of Rs.3825.00 per acre for their leased-out land. Again 4.00% farmers pay for leased-in land by kinds @ 8.04 qtls. per acre as fixed rent. Among the non-beneficiary farmers, 29.53% farmers for cultivating leased-in land and 19.32% farmers for cultivating leased-out land exchange a portion of their production with their counterpart. Apart from this system, 63.48% farmers pay fixed rent in cash of Rs. 8835.29 per acre for leased-in land and 80.68% farmers receive fixed rent in cash of Rs.3500.00 per acre for leased-out land. Side by side, 7.00% farmers pay fixed rent by kinds @ 8.53 qtls. per acre.

3.7.4. The crops those are grown in the study area fall in the four major categories, namely, cereals, pulses, Oilseeds and others. Rice is the only and main crop from cereals cultivated widely across the study area by occupying 83.05% and 90.77% to the gross cropped area in beneficiary and non-beneficiary farms respectively. Only 0.10% and 0.07% area of the total gross cropped area have been allotted for growing lentil and moong in NFSM

beneficiary farms and only black gram has been cultivated in a little piece of non-beneficiary lands. In beneficiary farms, three oilseeds crops, namely, groundnut, mustard and sesame have been grown in 0.74%, 0.68% and 3.76% area respectively to the total gross cropped area and in non-beneficiary farms, groundnut, mustard and sesame have been grown in areas of 0.21, 1.18 and 2.98 acres respectively. Others cultivated crops of the study area include jute, vegetables, banana, flower and potato. Among these crops, banana has only been cultivated in beneficiary farms in a small piece (total 1.17 acres only) of land. Remaining four crops have been cultivated in both beneficiary and non-beneficiary farms. Despite higher acreages allotment under cultivation of jute, vegetables, flower and potato in beneficiary farms (total 67.29 acres in beneficiary farms and total 16.61 acres in non-beneficiary farms), the percentage of cultivated area to total gross cropped area is lower for vegetables in beneficiary farms (1.73%) than non-beneficiary farms (4.13%). However, it is clear that area is predominant by rice cultivation. So the selection of this area for NFSM_Rice Programme is appropriate.

3.7.5. The overall average annual family income of the sample households is Rs. 31730.59 for beneficiary farms, whereas it is Rs. 32538.93 for non-beneficiary farms in the study area. But net income from per acre land cultivation of beneficiary and non-beneficiary farms was Rs. 21910.47 and Rs. 20303.69 respectively. The estimation indicates higher earning of beneficiary farms by Rs. 1606.78 over the non-beneficiary farms from per acre land cultivation. However, the income from non-farm sources is higher (Rs. 9564.50) in beneficiary families than income from non-farm sources (Rs. 8361.30) of non-beneficiary families. It is evident from the estimation of comparative economics of crop cultivation between beneficiary and non-beneficiary farms that gross as well as net farm incomes for all the crops in beneficiary farms are not same, except paddy, than their non-beneficiary counterpart. The gross and net return of paddy in beneficiary and non-beneficiary field are Rs.26130.53, Rs. 26180.24 and Rs. 7887.35, Rs.7955.84 respectively. It is similar in case of mustard and sesame too. But groundnut, however, depicts different picture. Despite higher cost of cultivation, the calculated gross as well as net income from groundnut cultivation is higher for beneficiary farms than non-beneficiary farms. In case of jute cultivation, non-beneficiary farmers go to the higher expense for per acre cultivation and they get higher gross as well as net return than beneficiary farmers. But in the vegetable field, despite higher expenses incurred, lower net return has been received by beneficiary farmers than non-beneficiary farmers. Again flower and potato cultivation provide a higher net return for non-

beneficiary famers, though they spent comparatively lower amount of rupees for these crop cultivation than beneficiary farmers.

3.7.6. Only 5.33% and 3.33% beneficiary farmers and only 5% non-beneficiary farmers have costly implement namely, Tractor and Electric Pumpset respectively and only 2% beneficiary farmers have another costly implement Power Tiller. Among the medium cost implement, only 27% beneficiary farmers and 18% non-beneficiary farmers have Diesel Pumpset. Among the sample farmers, 82.33% beneficiary and 87% non-beneficiary farmers have low cost implement like Knapsack Sprayers. Again, 71.67% beneficiary and 71% non-beneficiary farmers is the owner of another low cost implement Paddy Thresher. There are no other remarkable farm implements with the sample farmers, except some Spade, Sickle, etc.

3.7.7. Only the Commercial Bank and Primary Agricultural Credit Society (PACS) have played more or less significant role for sanctioning loan to the sample farmers. There are 24.7% and 19% beneficiary and non-beneficiary farmers respectively who have got loan from Commercial Bank. The Primary Agricultural Credit Society (PACS) has sanctioned loan for 14% beneficiary farmers and 6% non-beneficiary farmers. Other sources like, Government Agencies, Intermediaries, Self Help Group (SHG), Non-Government Organization (NGO), etc do not play remarkable role for sanctioning loan to the selected sample farmers.

It is evident from enquiry that maximum amount has been borrowed for housing purpose (Rs. 135000/-) followed by business (Rs. 24000/-) and agriculture (Rs. 20704.31) purposes by the beneficiary farmers. On the other hand, the non-beneficiary farmers have borrowed only for agriculture purpose by the amount of Rs. 30592.59.

CHAPTER 4

NFSM INTERVENTIONS AND ITS IMPACT ON FARMING

The NFSM programme envisaged "implementation of cropping system centric interventions in a Mission mode approach through active engagement of all the stakeholders at various levels"*. This included the agricultural experts from the State Agricultural Departments, the SAUs and the KVKs vis-à-vis the farmers at the grass root.

In terms of the NFSM Guidelines, the programme is to be implemented through the ATMA structure for dissemination of high yielding technology. The process involved adoption of bottom up planning procedures. The extension and delivery was to take shape of a group approach catering to the location specific requirement of the farmers giving adequate emphasis towards gender concerns. Hence, the success of the whole project under NFSM depended, to a large extent, on the awareness of the beneficiary farmers.

4.1. Awareness of NFSM

Results of the primary survey in West Medinipur and Howrah districts reveal that all the beneficiary farmers were aware of the NFSM programme. In all the CD blocks the beneficiary households responded in affirmative as regards to their awareness towards the project (Table 4.1a). In course of the primary survey it was found that the Department of Agriculture and the Panchayat carried out local level awareness meetings and programmes in all the blocks. The non-beneficiaries also seemed to be aware of the project. Only 22 per cent of non-beneficiary farmers in West Medinipur and 34 per cent in Howrah reported lack of awareness about the NFSM project. In both the districts 8 per cent of the beneficiary respondents were women. So, in a sense the process of technology dissemination in the survey area involved the farmers in general keeping in view the gender concerns.

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

Details of awareness	Percentage	
	Howrah	West Medinipur
% of beneficiaries aware about the NFSM	100.0	100.0
% of beneficiaries not aware about the NFSM	0.0	0.0
% of beneficiaries who did not reply	0.0	0.0

*NFSM Guidelines, Govt. of India

However, in course of the study we had the opportunity of discussing about the process of implementation of NFSM in the two districts with the state agricultural experts as well as local panchayat members associated with the process. The discussion indicated that a

thorough and transparent procedure was maintained in the selection of beneficiary and the demonstration clusters. But the process had been mostly a top down instead of a bottom up approach as envisaged in the NFSM guidelines, where the farmers could have generated their own demands and had the opportunity to participate in the planning process.

It is revealed from the data that the state department of agriculture has been instrumental in escalating the awareness among the farmers regarding NFSM in West Medinipur in particular. However, in Howrah the fellow farmers played an important role in increasing awareness about NFSM (Table 4.1b). At the block level, over 49 per cent of the respondents in Amta I became aware about NFSM from state departmental sources (Table I, Appendix). The corresponding percentages for Debra and Medinipur Sadar are 72 and 53.3 respectively. In Domjur, however, fellow farmers and friends played a key role in this connection. Even in the three blocks mentioned earlier, friends and fellow farmers turned out to be one of the main sources of information. In these three blocks (viz. Amta I, Debra and Medinipur Sadar) Gram Panchayat (GP) and Zilla Parisad (ZP) were also equally important.

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

		% of beneficiaries aware about NFSM			
District		Howrah		West Medinipur	
Sl.No	Sources of Awareness	Yes	%	Yes	%
1	News Paper	0	0.0	0	0.0
2	Agrl. Department	39	26.0	94	62.7
3	SAU	2	1.3	0	0.0
4	KVK	0	0.0	0	0.0
5	RSK	0	0.0	0	0.0
6	Farmers/ Friends	62	41.3	50	33.3
7	Input Supplier	0	0.0	0	0.0
8	Radio/TV	0	0.0	0	0.0
9	Ag. Exhibition	0	0.0	0	0.0
10	ZP/TP/GP	17	11.3	80	53.3
11	Any Other (Progressive Farmer)	46	30.7	0	0.0

Publicity of NFSM amongst all groups of stakeholders was supposed to be one of the important aspects of its success. Hence, the districts adopted different publicity measures including use of print and electronic media to publicize the programme. Apart from the print media, the State Directorate has been using AIR and DD for publicizing the NFSM programme. But unfortunately, these awareness programmes have had little impact in the areas under consideration. The progressive farmers of Howrah, however, played a significant role in course of increasing awareness among the farmers.

4.2. Costs and Subsidy Particulars of Availed NFSM Benefits

The results of the primary survey reveal that in both the districts NFSM benefits centered around distribution of seed minikits of improved variety of rice to the farmers, few plant protection chemicals, INM and IPM nutrients and chemicals. Amount of subsidy on seed minikit distributed to the beneficiary farmers per household was to the tune of Rs. 416.92, which accounted for 92 per cent of the total cost on seed (Table 4.2). Costs on PPC, INM and IPM per beneficiary households in aggregate were to the tune of Rs. 625.38, Rs.773.12 and Rs.1000.77 respectively, of which amount of subsidy accounted for 86.1 per cent, 60.81 per cent and 24.67 per cent respectively. A section of beneficiary farmers in Howrah received cash subsidy for the purpose of threshing that amounted to 18.26 per cent of the cost towards threshing.

Table 4.2: Particulars of benefit availed (2013-14)

Sl.No	Benefit Item Name	% of HHs benefitted to aggregate sample	Total Cost (Rs. per HH benefited)	Subsidy per Household	Subsidy as a % of total cost
1	Seed minikits HYV/Hyb.	100.0	452.59	416.92	92.12
2	PPC	80.7	625.38	538.47	86.10
3	INM	63.3	773.12	470.10	60.81
4	IPM	13.0	1000.77	246.92	24.67
5	Others	37.3	1872.86	341.96	18.26
Total		300	2276.00	1308.78	57.50

However, when looked at componant level, one finds that the subsidized seed minikits was distributed more or less uniformly across the districts and the proportion of subsidy, barring Medinipur Sadar, accounted for over 98 per cent of the cost of seed (Table II Appendix). Number of beneficiaries who also availed PPC benefits was 100 per cent in Amta I, Domjur and Medinipur Sadar blocks while the corresponding number was only 34 in Debra block. Only 39 respondents from Medinipur Sadar block reported deriving the benefit of Integrated Paste Management (IPM) wherein the proportion of subsidy was to the tune of 24.7 per cent. Cash subsidy towards threshing charges was provided to the farmers of Amta I and Domjur in the district of Howrah only. Proportion of cash subsidy had been 18.2 and 18.3 per cent in the two blocks respectively. On the whole it can be said that apart from distribution of HYV/Hybrid seeds (ARIZE 6444 – Hybrid variety and MTU 7029, MTU 1010 – HYV) the PPC and INM measures were undertaken at a significant scale.

4.3. Annual Usage of Farm Equipments and their Benefits

In course of the field survey it was observed that the NFSM programme benefits were restricted within making provisions for improved seeds, micro nutrients and plant protection chemicals in both the districts. None of the beneficiaries had been provided with farm equipments under the scheme. This might have been due to the fact that NFSM is being implemented in the survey areas for the first time in 2013-14. On the other hand, it is also true that implementation of NFSM programme in the areas under consideration had centered primarily around block demonstrations of rice.

One of the major idea behind linking NFSM with ATMA was to increase programme coordination and integration, so that the farmer organization, technology gaps and natural resource management can be handled more effectively and efficiently. It was envisaged that the implements once distributed would be used and taken care of by the farmers' own organizational arrangement on sharing basis.

4.4. Impact of the benefit availed under NFSM

On the whole the impacts of NFSM programme as reported by the beneficiaries were based on block demonstration of rice. As regards programme's impact on productivity, most of the farmers were of the opinion that the new and improved variety has been effective in increasing the productivity of rice. Out of 300 beneficiary farmers who were allotted HYV/Hybrid seeds, 46.7 per cent opined that the increase was less than 5 per cent while 34. 7 per cent agreed upon the increase to be between 5 to 10 per cent (Table 4.3). Around 22 farmers (7.3 %) had the impression that the increase in productivity was between 10 to 15 per cent. Productivity increase arising out of use of PPC was reported by 64 per cent of the beneficiary farmers while the corresponding proportion towards INM was 44.2 per cent.

In each development block over 85 per cent of the beneficiary farmers opined to have enjoyed an increase in productivity resulting out of HYV/Hybrid seeds (Table III Appendix). So far as responses regarding benefits accrued through block demonstration are concerned, there seems to be little difference between the districts and blocks. The two districts, as we know, were selected in a manner that Medinipur West having highest production and Howrah having lowest production of rice. The two blocks from each district were selected on the basis of proximity of the block from district HQ – so that one has close proximity while the other is situated far away. But the data do not reveal any substantial difference between the responses

relating to the demonstration benefits from the recipients, so that we are in a position to differentiate between the blocks or the districts. In course of the survey the farmers seemed to be quite happy with the productivity response of the supplied seed.

Table 4.3: Impact of the benefit availed under NFSM

Benefit derived	Impact	% of farmers opined				
		Seed minikit	PPC	INM	IPM	Other benefit*
% Increase in Productivity	No Change	11.3	36.0	55.8	53.8	100.0
	<5%	46.7	59.5	40.5	46.2	0.0
	5-10%	34.7	4.5	3.7	0.0	0.0
	10-15%	7.3	0.0	0.0	0.0	0.0
% Fall in Material Cost	No Change	31.0	67.8	100.0	48.7	100.0
	<5%	59.7	32.2	0.0	48.7	0.0
	5-10%	9.3	0.0	0.0	2.6	0.0
% Fall in Water Use	No Change	79.7	100.0	100.0	100.0	100.0
	<5%	20.3	0.0	0.0	0.0	0.0
	5-10%	0.0	0.0	0.0	0.0	0.0
% Fall in Labour Cost	No Change	100.0	100.0	100.0	100.0	15.2
	<5%	0.0	0.0	0.0	0.0	67.0
	5-10%	0.0	0.0	0.0	0.0	17.9
% Fall in Losses	No Change	100.0	62.4	51.1	59.0	100.0
	<5%	0.0	37.6	48.9	41.0	0.0
	5-10%	0.0	0.0	0.0	0.0	0.0
% Increase in Price	No Change	100.0	100.0	100.0	100.0	100.0
	<5%	0.0	0.0	0.0	0.0	0.0
% Increase in Soil Health	No Change	100.0	100.0	100.0	100.0	100.0
	<5%	0.0	0.0	0.0	0.0	0.0
% Increase in Human Health	No Change	100.0	100.0	100.0	100.0	100.0
	<5%	0.0	0.0	0.0	0.0	0.0
Total Respondents		**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

** Cash subsidy for harvesting*

Farmers' opinion regarding reduction in material cost corroborates our earlier finding that generally the farmers seemed to be more or less satisfied with crop demonstration under ongoing NFSM programme. As they received subsidies towards seeds, pesticides and plant protection chemicals, that had a cost reducing effect in view of crop enterprise. As regards to IPM, 48.7 per cent beneficiaries has opined a reduction in material cost to the tune less than 5 per cent while 2.6 per cent of the farmers had the opinion that proportion of reduction had been between 5 to 10 per cent (Table 4.3). Similarly, a substantial proportion of farmers agreed upon that there have been a reduction in losses due to use of PPC.

4.5. Per acre Cost and Return of Paddy in *Kharif* and *Summer* 2013-14

In course of the study, data pertaining to cost and returns of the crop enterprise during Kharif and/or Summer by both the beneficiary and non-beneficiary farmers were collected. It appeared that in Medinipur Sadar block NFSM crop demonstration was launched in the Kharif season and in other three blocks vis. Amta I, Domjur and Debra it was during Summer. Moreover, in Debra hybrid seeds (ARIZE 6444) were distributed while in the other two blocks HYV seeds of summer rice (MTU 1010) were in focus of crop demonstration.

During Kharif, i.e. the monsoon crop, the NFSM farmers had a marginal edge over the non-NFSM farmers in terms of productivity. However, net return per acre was higher among the non-beneficiary farmers as compared to their beneficiary counterpart (Table 4.4). Per acre net return form crop enterprise was to the tune of Rs.7429.42 among the non-beneficiary farmers vis-à-vis Rs. 5487.62 among the beneficiaries. In terms of gross returns and income from by-product, the non-beneficiary respondents seemed to have an edge over the beneficiary farmers. However, quantum of production per acre and value of main output do not reveal a significant difference between the two sections. Higher net return (with subsidy) among the NFSM farmers is observed only when the quantum of subsidy is deducted from the total cost. Subsidy on seeds and other nutrient and paste management measures had had its impact in augmenting net return from crop enterprise for the NFSM farmers. For Kharif rice the amount of subsidy per acre amounts to Rs.2284.00 and hence, the net income per acre turns out to be Rs. 7771.61 (For more detail please see Table IV Appendix). Turning to the cost components, it is revealed that NFSM beneficiaries employ more family labour than the non-beneficiaries.

Moreover expenditure towards irrigation charges was meager in Kharif season. Kharif rice is cultivated during the monsoon and farmers in years of usual rainfall need very little supplementary irrigation. Moreover, most of the farmers in the two districts have access to irrigation from government canals during monsoon and canal charges are very low. But these canals are unable to provide water for irrigation during Summer season. So cultivators of Summer rice have to depend almost entirely on sub-soil water from shallow tube wells or submersible tube wells purchased from private water entrepreneurs at a very high cost.

Table 4.4: Per acre cost and return of paddy in *Kharif* 2013-14

		NFSM		Non NFSM	
Particulars	**Unit**	**Qty**	**Val (Rs.)**	**Qty**	**Val (Rs.)**
Hired labour	Manday	50.88	7098.63	55.26	7711.51
Family labour	Manday	9.97	1505.96	4.02	596.06
Bullocks*			556.71		672.08
Tractor*			1855.49		1567.65
Seed	Kgs	29.18	900.91	31.65	871.31
Farmyard Manure	Kgs	1880.09	1322.08	2136.26	1538.52
Fertilizer+	Kgs	92.42	1817.65	115.89	1260.08
Pesticide	Kgs/Lit	1.42	1332.79	0.78	789.72
Irrigation charges			51.90		12.73
Harvesting & threshing			1190.43		1191.50
Transport cost			0.00		0.00
Total_cost			16974.17		15589.37
Main product	Qnt	15.78	18741.28	15.52	18800.38
By_product*			3720.51		4218.40
Gross_income			22461.79		23018.78
Net_income without subsidy			5487.62		7429.42
Amount of subsidy			2284.00		0.00
Net Income with subsidy			**7771.61**		**7429.42**
Cost_per_qnt.			1075.47		1004.62

***Quantity figures were not available, + Including micro nutrients

On the contrary, in terms of per acre productivity of summer rice the NFSM farmers had a clear edge over the non-beneficiaries. Hence, gross and net return from summer crop enterprise is higher among the beneficiaries than the non-beneficiaries. The net return per acre for beneficiaries amounts to Rs.17687.40 in comparison with Rs.16109.43 of the non-beneficiaries (Table 4.5). Now if the subsidy amount of Rs.2696.85 per acre is added, the net return per acre gets enhanced to Rs. 20384.24. At the disaggregative level in all three blocks (viz. Amta I, Domjur & Debra) net return per acre is significantly higher for the beneficiary farmers (Table V Appendix). Especially in Debra block, where hybrid variety had been distributed, net income (value calculated on the basis of price) is highest. Labour usage reveals a similar pattern as in case of Kharif cultivation. So, in a sense the NFSM technology has had its impact on increasing productivity and net income of the farmers. These observations regarding cost and returns corroborate with the response of the farmers regarding increase in productivity and reduction in material cost.

Table 4.5: Per acre cost and return of paddy in *Summer* 2013-14

		NFSM		Non NFSM	
Particulars	**Unit**	**Qty**	**Val (Rs.)**	**Qty**	**Val (Rs.)**
Hired labour	Manday	29.37	4678.01	43.18	6844.34
Family labour	Manday	31.81	5220.39	17.39	2825.40
Bullocks*			212.18		195.37
Tractor*			1995.06		1465.51
Seed	Kgs	17.55	837.96	30.47	1008.20
Farmyard Manure	Kgs	165.67	123.48	1218.28	735.73
Fertilizer+	Kgs	191.73	3735.27	165.58	2972.40
Pesticide	Kgs/Lit	1.22	1114.64	1.31	1214.62
Irrigation charges			4409.06		3808.29
Harvesting & threshing			1197.86		1192.07
Transport cost			0.00		0.00
Total_cost			22142.78		21144.17
Main product	Qnt	23.99	36136.00	22.29	34111.96
By_product*			3694.17		3141.64
Gross_income			39830.17		37253.60
Net_income without subsidy			17687.40		16109.43
Amount of Subsidy			2696.85		0.00
Net income with subsidy			**20384.24**		**16109.43**
Cost_per_qnt.			922.83		948.54

***Quantity figures were not available, + Including micro nutrients

4.6. Marketed Surplus and Marketing Channels

It is evident from the primary data that over 80 per cent of the total output of Paddy, is being sold out by the non-NFSM farmers while the corresponding proportion for the NFSM farmers is to the tune of 63 per cent (Table 4.6). Bulk of total sales is being done through the local merchants in both the districts. When analyzed across the seasons, it is revealed that major part of the total output, barring summer crop by NFSM beneficiaries, is being sold out by all categories of farmers (Table VI, Appendix). Among the beneficiary farmers cultivating summer rice the sale of output is to the tune of 58.5 per cent of the gross output. But this table reveals only a part of the story. The data, when analyzed block wise points towards some other problems which had been reported over and over again by the farmers in course of the survey. It is evident from the disaggregative data that over 80 per cent of Kharif rice in Medinipur Sadar block is being sold by both the beneficiary and non-beneficiary farmers. But as the question boils down to the marketing behavior of the beneficiaries of Summer crop, the marketed proportion gets reduced. Both the blocks of Howrah viz. Amta I and Domjur register sales proportion around 70 per cent, while the similar proportion in case of Debra is

strikingly low (only 17.6%). On the contrary the non-NFSM farmers carrying out cropping activities in Summer had sold out their output in a proportion over 82 per cent. It might be a case that the NFSM farmers of Amta I and Domjur have retained a sizeable proportion of their high yielding output for family consumption. But the exceptionally high retention by the beneficiary farmers of Debra seems quite unusual. In course of the survey we had come across complaints, more often than not, regarding the marketability of hybrid variety of rice (which was distributed in Debra). The coarse quality of the grain from hybrid paddy does not correspond to the food habit of the locality and posed hindrance in marketing the output. Moreover, the local traders remained disinterested in purchasing the hybrid produce for the fact that the rice millers did not accept such a meagre quantity for processing. The respondents seemed to be quite satisfied with its productivity response but at the same time they were unhappy as regards to its market prospects. Hence, it ended up with a forced retention of 82.4 per cent of total output.

Table 4.6: Marketing channels and marketed surplus of paddy

Sl No	**Particulars of output sold**	**NFSM**		**Non NFSM**	
		% of HH	% of value marketed	% of HH	% of value marketed
1	Local Market	22.0	6.8	23.0	21.3
2	Merchant	78.0	93.2	77.0	78.7
	% of Total output		**63.1**		**83.0**

Coming now to the question of marketing channels, one would find that the local merchants play the vital role in marketing of output by the farmers. As they are small producers it is difficult for them to take the advantage of retail selling by their own effort. The non-NFSM farmers are also dependent on the merchants for the sale of output. In Amta I and Domjur blocks local merchants play the key role for marketing of Summer rice (Table VII Appendix). In both the areas the whole marketing is being done through the merchants. In Debra block, however, the HYV output of the non-NFSM farmers are sold in the market by the households as well as through the merchants. On the contrary the beneficiary farmers of Debra block, cultivating hybrid rice, have to shoulder the main responsibility of marketing their own produce. Kharif output in Medinipur Sadar is also marketed through the merchants. So, in a sense the local paddy and rice merchants in the rural sector dominates the scenario of marketing channels.

4.7. Summary of the Chapter 4

4.7.1. In course of the primary survey it was found that the farmers in general were aware about the NFSM programme. The Department of Agriculture and the Panchayat carried out local level awareness meetings and programmes in all the blocks. However, only 22 per cent of non-beneficiary farmers in West Medinipur and 34 per cent in Howrah reported lack of awareness about the project. In both the districts 8 per cent of the beneficiary respondents were women. It is revealed from the data that the state department of agriculture has been instrumental in imparting awareness among the farmers regarding NFSM in three CD blocks out of the four. In one block, however, fellow farmers and friends played an important role in this connection. Enhancements of awareness through print and electronic media have had little impact in the areas under consideration. The progressive farmers of Howrah district, however, played a significant role in course of increasing awareness among the farmers.

4.7.2. Amount of subsidy on seeds distributed to the beneficiary farmers in aggregate accounted for 92 per cent of the total cost on seed. Costs on PPC, INM and IPM per beneficiary households accounted for 86.1 per cent, 60.81 per cent and 24.67 per cent of respective costs. Apart from distribution of HYV/Hybrid seeds (ARIZE 6444 – Hybrid variety and MTU 7029, MTU 1010 – HYV) the distribution of Plant Protection Chemicals (PPC) and measures regarding Integrated Nutrient Management (INM) were undertaken at a significant scale.

4.7.3. None of the beneficiary had been provided with farm equipments under the scheme. This might have been due to the fact that NFSM is being implemented in the survey areas for the first time in 2013-14. On the whole it can be said that implementation of NFSM programme in the areas under consideration had centered primarily around block demonstrations of rice.

4.7.4. As regards to the impact of the programme to increase the productivity, most of the farmers were of the opinion that the new and improved variety has been effective in increasing the productivity of rice. Out of 300 beneficiary farmers, 46.7 per cent opined that the increase was less than 5 per cent while 34. 7 per cent agreed upon that the increase to be between 5 to 10 per cent and 7.3 per cent was of the impression that the increase in productivity was between 10 to 15 per cent**.** No substantial differences between the responses across the blocks or districts were visible as to demonstration benefits. In course of the

survey the farmers seemed to be quite happy with the productivity response of the supplied seed.

4.7.5. In terms of productivity of the crop (paddy), the NFSM farmers seem to reap the benefit of improved variety particularly in the summer season. Hence, in aggregate gross and net return from crop enterprise is gainful for the ones having NFSM benefits. Moreover, if one deducts the subsidy amount from the total cost, the net income of the beneficiary households increase substantially. Given the subsidy in respect of seeds, micro nutrients and plant protection chemicals, the beneficiary farmers exhibit better net return from crop enterprise than their non-beneficiary counterpart. Turning to the cost components, it is revealed that NFSM beneficiaries employ more family labour than the non-beneficiaries. So, in a sense the NFSM technology with its provision for subsidies has had its impact in increasing productivity and income of the beneficiary farmers.

4.7.6. It is evident from the primary data that over 80 per cent of the total output of Paddy, barring summer crop by NFSM beneficiaries, is being sold out by all categories of farmers. Among the beneficiary farmers cultivating summer rice, leaving Debra aside, the sale of output is around 70 per cent of the gross output. Retention of the Summer produce by the beneficiaries of this block is strikingly high. It should be remembered that hybrid seeds were distribute in this region for crop demonstration. The coarse grain from hybrid paddy posed hindrance in marketing the output. At the same time, the local traders remained disinterested in purchasing the hybrid produce as the rice millers did not accept such a meagre quantity. The respondents seemed to be quite satisfied with its productivity response but at the same time they were unhappy as regards to its market prospects. Hence, it ended up with a forced retention of 82.4 per cent of total output.

In the scenario of marketing, one would find that the local merchants play the key role. Being a small producer it is difficult for them to take the advantage of retail selling by their own effort. This remains true for beneficiary as well as non-beneficiary farmers with the exception of hybrid cultivators in Debra, where they had to shoulder the main burden of marketing the produce.

CHAPTER 5
PARTICIPATION DECISION, CONSTRAINTS AND SUGGESTIONS FOR IMPROVEMENT OF NFSM

5.1. Factors Influencing Participation of Farmers in NFSM

Experience from the past tells us that the farmers are often hesitant or reluctant in adopting something new or participating in a new government programme. It thus remains important to identify the factors responsible for determining participation of the farmers in schemes like NFSM.

Here, to find out the factors influencing the decision of farmers regarding whether or not to be a beneficiary of the NFSM scheme, we have to take resort to qualitative response regression models as the regressand itself is qualitative in nature. Here the response variable, regressand, is a binary or dichotomous variable, which can take only two values, say 1 if the farmer has participated in the NFSM programme and 0 otherwise. In particular, we resort to a logit function, where the logit L is defined as-

$$Li = ln\ [P_i / (1 - P_i)] = Z_i = \beta_1 + \beta_2 X_i + u_i$$

-where P_i is the probability of participating in NFSM programme; and *Li*, the log of the odds ratio, is called the logit.

As we are dealing with data at the individual level, it is easy to see that $P_i = 1$ if a farmer participates in the NFSM programme, and $P_i = 0$ otherwise. Now putting the value directly into the logit L_i, we obtain-

$L_i = ln\ (1/0)$ if a farmer participates in the NFSM programme; and

$L_i = ln\ (0/1)$ if a farmer does not participate in the NFSM programme.

As this expression are meaningless, we cannot estimate the logit model specified by us by the standard OLS routine, and take resort to the maximum-likelihood method to estimate the parameters. The particular logit model we are to estimate can be written as-

$$Li = ln\ [P_i / (1 - P_i)] = Z_i = \beta_1 + \beta_2 \text{Farm-size}_{+.....+} u_i$$

It should be noted at the outset that in binary regressand models, goodness of fit is of secondary importance. What matter are the expected signs of the regression coefficients and their statistical and/or practical significance.

It may also be noted here that in our model, the independent variables include certain dummy variables as well. In particular, Education Dummy 1 assumes the value of 1, if the level of education of the farmer is up to primary, else 0. Similarly, Education dummy 2 assumes the value of 1, if level of education of the farmer is higher than primary up to secondary, else 0. In case of 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 category, else 0. Similarly, the Caste Dummy 2 assumes the value 1, if the respondent farmer falls in the ST category, else 0. The results of the logit model is presented in Table 5.1(a) as under-

Table 5.1 (a): Factors influencing participation in NFSM
(Dependent variable: 1 for NFSM beneficiaries; others: 0)

Logit estimates Dependent Variable: Benefit Dummy		Number of obs =		400
		LR chi2(11) =		9.1
		Prob > chi2 =		0.6129
		Pseudo R2 =		0.0202
		Log likelihood =		-220.3851
Independent Variables	Coef.	Std. Err.	z	P>|z|
Age	-0.003	0.010	-0.240	0.806
Education Dummy 1	-0.127	0.563	-0.230	0.821
Education Dummy 2	-0.039	0.714	-0.050	0.957
Family Size	-0.038	0.047	-0.810	0.418
Caste Dummy 1	-0.363	0.531	-0.680	0.494
Caste Dummy 2	-0.291	0.270	-1.080	0.280
Family Size	-0.047	0.136	-0.340	0.731
Farm Income	0.000	0.000	-0.250	0.802
Farm Asset Value	0.000	0.000	-0.780	0.436
Credit Availed per Acre	0.000	0.000	1.470	0.143
Ratio of NIA to NSA	1.681	1.189	1.410	0.157
Constant	0.026	1.333	0.020	0.984

Incidentally, the result of our logit regression model fails to fit to our data as revealed by LR Chi^2 and Pseudo R^2. In fact, none of the coefficients of the independent variables (including constant) appears statistically significant, as revealed by the values of Z statistic and the values of P>|Z|.

As such poor model fits can be obtained under the presence of strong multicollinearity as well, we have constructed a partial correlation coefficient matrix for the variables in the model (including the dependent variable) to rule out the presence of multicollinearity, which is presented in table 5.1(b).

However, the partial correlation coefficient matrix does not reveal any indication of multicollinearity problem in our model. Only a correlation coefficient measure of 0.576 between farm size and farm income can be observed in the matrix, which is quite obvious in farm economics. Apart from this, none of the any two variables included in our model exhibits strong correlation between each other. As such, the presence of multicollinearity may safely be ruled out from our logit model.

Our findings strongly indicate that there might be other variables not included in our logit model which influences one's decision regarding participation in NFSM scheme. As learnt from the discussions and interviews with the farmers, we propose that further research into the subject might think of involving factors like political identity of farmers, i.e. whether or not the farmer belongs to the ruling party in the region, as an important explanatory factor in participation decisions in public sector schemes like NFSM. For the present moment, it can only be said that our logit model does not fit to data, and no confirmed relationship among the dependent and independent variables can be established.

Table 5.1 (b): Partial Correlation Coefficient Matrix of Variables included in the Logit Regression Model

	Benfit Dummy	Age	Education Dummy 1	Education Dummy 2	Family Size	Caste Dummy 1	Caste Dummy 2	Fam Size	Farm Income	Farm Asset Value	Credit Availed per Acre	Ratio of NIA to NSA
Benfit Dummy	1											
Age	-0.045	1										
Education Dummy 1	-0.022	-0.008	1									
Education Dummy 2	-0.009	0.029	-0.035	1								
Family Size	-0.071	0.254	0.031	0.059	1							
Caste Dummy 1	-0.013	0.067	0.004	-0.041	-0.001	1						
Caste Dummy 2	-0.058	0.215	0.041	0.060	-0.050	-0.267	1					
Farm Size	-0.074	0.081	0.056	0.161	0.190	-0.062	0.219	1				
Farm Income	-0.041	-0.022	0.167	0.086	0.050	0.040	0.114	0.576	1			
Farm Asset Value	-0.039	0.098	-0.046	-0.060	0.093	0.086	-0.102	0.099	0.022	1		
Credit Availed per Acre	0.056	0.122	-0.023	0.013	0.031	0.055	0.127	-0.033	0.023	0.065	1	
Ratio of NIA to NSA	0.092	-0.105	-0.035	0.007	-0.198	0.062	-0.160	-0.139	0.005	0.009	-0.096	1

5.2. Constraints Faced in Availing the NFSM Benefits

To avail benefits under central/state sector schemes, it has been widely observed that the farmers often have to face numerous difficulties at different stages of implementation process of the schemes. It is here that we have tried to examine whether and to what extent the beneficiaries under the NFSM scheme face various constraints in availing benefits under the schemes. We have also tried to examine the exact nature of the constraints faced by the beneficiary farmers in availing the benefits under NFSM.

First, we asked the beneficiary farmers whether, on the whole, they faced any problem while availing benefits under NFSM or not. Response from the farmers reveals that there are very little constraints in availing benefits under the NFSM scheme on the whole. In particular, only 9 per cent of all beneficiary farmers reported that they had faced problems in availing benefits under the NFSM scheme. It may be noted here that while presence of such problems is not reported in Debra block of West Medinipur, that in the Medinipur Sadar block stands quite high as 28 per cent of beneficiaries in the block reported of facing problems in availing benefits under NFSM. However, apart from Medinipur Sadar block, beneficiaries from the other three blocks remained largely satisfied as there are very little reports of gross difficulties in availing benefits under NFSM.

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

Sl. No	Howrah - Amta	Howrah - Domjur	W.Medinipur - Debra	W.Medinipur - Sadar	All
% of beneficiaries faced problem/s while availing the scheme	2 (2.7)	4 (5.3)	0 (0.0)	21 (28.0)	27 (9.0)

Figures in parenthesis indicate percentages

To investigate further, we have carried out a detailed probe into the exact nature of problems faced by beneficiary farmers in availing benefits under the NFSM scheme across the four sample blocks from over two districts. Here it comes out that-

a) There exists a huge information gap between the farmer households and the implementing authority of NFSM, as only 7 per cent of all beneficiary farmers ascertained that information about NFSM reached them comprehensively. In fact, a block-wise analysis reveals that apart from Debra block of West Medinipur, the information gap is the common feature in all other blocks.

b) Eligibility criteria for availing benefits under NFSM have not reached the farmers of Howrah district at all as compared to Medinipur district, where 64 per cent of the beneficiary farmers know about the eligibility criteria, particularly in Medinipur Sadar block.

c) The procedure followed in availing benefits under the scheme is truly quite easy, as revealed by most of the beneficiary farmers across all sample blocks under study.

d) It is also largely admitted by almost all the beneficiary farmers across the sample blocks (particularly in West Medinipur district) that only a few documents are required for availing benefits under the NFSM scheme.

e) The beneficiary farmers by and large admitted that they got their subsidy amount on time, except for Medinipur Sadar block of West Medinipur, where initial payment remains the highest problem as the subsidy was paid after a long time of actual purchase of inputs. In all other blocks, the beneficiary farmers ascertained that subsidy amount reached them on time without any major delay.

f) It was also widely confirmed by the beneficiary farmers that the NFSM scheme arranged for institutional financing, though it seems that the farmers willfully opt out from such arrangements (as revealed by credit information of the households).

g) While technical support/advice was largely available under the NFSM scheme in Howrah district (as revealed by 70% of beneficiary farmers of Howrah district), that in West Medinipur district was almost not available, as only 2 per cent of beneficiary farmers in West Medinipur district expressed that they received technical advice under the NFSM scheme.

h) Only 23.33 per cent of beneficiary farmers of West Medinipur district, particularly hailing from Debra block, alleged that the NFSM scheme is biased towards larger farms. Otherwise, the NFSM scheme appeared not biased to any particular size class of farms, be it large or small.

i) There has been no allegation regarding poor quality of materials/machineries being distributed under the NFSM scheme. As also, no other constraints were there, that might act as a problem in availing benefits under the NFSM scheme.

Table 5.2(b): Details of Constraints faced in availing the NFSM benefits (only Beneficiary)

Constraints		Howrah - Amta		Howrah -Domjur		W.Medinipur - Debra		W.Medinipur - Sadar	
		Yes (%)	Remarks	Yes (%)	Remarks	Yes (%)	Remarks	Yes (%)	Remarks
1	Information about NFSM reaches comprehensively to the households	0 (0.0)	Info not available - 75	0 (0.0)	Comp.Info not available -35; Info. from only Farmer/Friend-10; Info. from only Progg. Farmer -30	20 (26.7)	NA-14; Info.from SDA&GP-15; Info.from SDA&Friend-3; Info.from only SDA-21; Info.from GP&Friend-12; Info. From only GP-9	1 (1.3)	NA-15; Info.from SDA&GP-6; Info.from SDA&Friend-8; Info.from only SDA-8; Info.from GP&Friend-8; Info. From only GP-10
2	Eligibility or criteria for availing the subsidy is provided to the households	0 (0.0)	Info not available - 75	0 (0.0)	Info not available - 75	30 (40.0)	Info not available - 45	66 (88.0)	Info not available - 9
3	Procedure for the subsidy quite easy (if no provide details in remarks)	75 (100.0)		75 (100.0)		59 (78.7)	Benefits distributed in Kind -2; Only seeds distributed-14	69 (92.0)	Info not available - 6
4	Only few documents are required for availing the subsidy (if no provide details in remarks)	58 (77.3)	Info not available -17	65 (86.7)	Info not available - 10	75 (100.0)		75 (100.0)	
5	Subsidy paid after purchase while initial payment remains the highest problem	0 (0.0)		0 (0.0)		0 (0.0)		45 (60.0)	Fertilizer Purchased in June 2013 but Subsidy arrived late- 39; NR-6
6	Institutional financing facility available under the programme	75 (100.0)		75 (100.0)		75 (100.0)1		73 (97.3)	Info not available - 2
7	Capacity building/technical advice is provided under the programme	59 (78.7)	NR -16	46 (61.3)	NR -29	3 (4.0)	NR -72	0 (0.0)	NR -75
8	Long time gap between the purchase and receiving the subsidy amount	0 (0.0)		0 (0.0)		0 (0.0)		66 (88.0)	Subsidy received after one yr-60; NR-6
9	Biased towards large land owners	0 (0.0)		0 (0.0)		27 (36.0)	NR-27	8 (10.7)	NR-8
10	Poor quality of materials/machinery are supplied	0 (0.0)		0 (0.0)		0 (0.0)		0 (0.0)	
11	Others	0 (0.0)		0 (0.0)		0 (0.0)		0 (0.0)	

Figures in parentheses indicate percentages

5.3. Suggestions for Improvement of the NFSM Scheme

For a public sector scheme to achieve success, review of its performance is as important as the scheme itself. One of the major indicators of assessing performance of schemes like NFSM is to analyze suggestions made by those availing direct benefit from the scheme, as also suggestion made by those beyond the reach of the scheme. It is here that Table 5.3 and Table 5.4 take account of the suggestions made respectively by the beneficiaries and the non-beneficiaries of the NFSM scheme.

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

Sl. No.	Suggestions	% of the beneficiaries
1	CASH SUBSIDY REQUIRED	5 (1.67)
2	CONTINUTY OF NFSM	54 (18)
3	CROP INSURANCE NEEDED	36 (12)
4	FERTILIZERS NEEDED	60 (20)
5	INSTITUTIONAL FINANCE NEEDED	8 (2.67)
6	INSUFFICIENCY OF INPUTS	17 (5.67)
7	IRRIGATION SUPPORT	62 (20.67)
8	MARKETING SUPPORT	79 (26.33)
9	QUALITY SEEDS NEEDED	28 (9.33)
10	SUBSIDIZED IMPLEMENTS	20 (6.67)
11	TIMELY DISTRIBUTION OF INPUTS	140 (46.67)
12	TRAINING REQUIRED	69 (23)

Note: Figures in parentheses indicate percentage to total beneficiary respondents

In case of suggestions made by the beneficiaries of the NFSM scheme, it is extremely important to note that as much as 46.67 per cent of beneficiaries complained about timely distribution of inputs under the scheme. In fact, while conducting field survey, it is observed that distribution of inputs like fertilizers, seeds, pesticides, etc. to the beneficiary farmers starts too late to be used in due time for the intended season of cultivation. The delay in distribution of inputs might be due to any reason (like official time lags), but the beneficiary farmers are the end sufferers for the delay. Delayed application of inputs is neither scientifically approved nor it is in line with traditional cultivation practices, rather it may cause serious negative influence on crop output. For this, near about half of the beneficiary farmers suggested that the distribution of inputs under the NFSM scheme should be organized in due time, so as to allow timeliness in application of inputs by the beneficiary farmers.

Apart from this, there has been a strong suggestion for arranging marketing support for paddy by more than one-fourths of the beneficiary farmers. While conducting survey, it is learnt that the paddy produce using hybrid seeds are often not accepted for purchase by the local paddy dealers and rice millers. This is particularly because of certain aspects which

need proper attention from the policy makers. First, the rice millers often refuse to buy hybrid paddy as it is not economical for the rice millers to procure such small quantities of hybrid varieties of paddy from a handful of farmers. This problem of scale on the part of the rice millers also arises in case of processing such small quantities of hybrid paddy into rice, as such an operation become uneconomical from the economic perspective of a rice mill. As a result, the local paddy dealers and paddy traders also refuse to buy such small quantities of hybrid rice from only a handful of beneficiary farmers. The local demand for processed hybrid rice is also quite low as it does not match quality and taste preferences of the local consumers. It might also be noted here that those who retain a part of hybrid paddy out for self-consumption, reported that it takes more fuel and time to boil a hybrid variety of rice as compared to HYV varieties, and does not taste good as well. All these indicate that there is a serious problem of marketability of hybrid rice produced by the beneficiary farmers under the NFSM scheme in cases where hybrid seeds are distributed as input incentives.

Other important suggestions from the beneficiaries include suggestions from providing irrigation, training, greater amounts of fertilizers, etc. Such suggestions, broadly speaking, are either season specific or crop specific in nature. The suggestion for providing irrigation under NFSM assumes importance only if the targeted season for dissemination of technology and inputs under the NFSM scheme is scheduled in summer. Thus, on the whole, two major suggestions come up from the side of the NFSM beneficiaries, viz. timely distribution of inputs under the scheme and provision of marketing support of paddy, especially hybrid paddy, for the beneficiaries.

On the part of the non-beneficiary farmers, it can also be observed (Table 5.4) that a majority (41%) of non-beneficiary farmers suggested for improvement in marketing facilities for their paddy output. As such, comparing with the results of Table 5.3, it is revealed that marketing of paddy out for the farmers is a challenging issue in the study region in general, irrespective of whether the farmers belong to NFSM beneficiary pool or not. It can however be said, based on field visits, that problems faced in marketing of paddy aggravates further particularly when it is hybrid paddy in nature.

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

Sl. No.	Suggestions	% of the non-beneficiaries
1	MARKETING SUPPORT	41 (41.00)
2	NFSM SHOULD CONTINUE	15 (15.00)
3	QUALITY SEEDS NEEDED	15 (15.00)
4	SUBSIDIZED IMPLEMENTS	7 (7.00)
5	TIMELY AVAILABILITY OF INPUTS	14 (14.00)
6	TRAINING REQUIRED	8 (8.00)

Note: Figures in parenthesis indicate percentage to total beneficiary respondents

5.4. Reasons for Non-Participation in the NFSM

To achieve success in the promotion of a public scheme it is also important to analyze the reasons for exclusion of farmers from the specific scheme. Here, when the non-beneficiaries were asked about the reasons for non-participation in NFSM scheme, several reasons/suggestions came up. First, a majority of non-beneficiaries (28%) reported that the reason behind their non-participation is lack of knowledge about the specific scheme. This directly indicates that awareness programmes under the NFSM scheme needs more attention. Also, one-fourths (25%) of the non-beneficiaries expressed that the selection of beneficiaries are politically decided, and only the cadres of the ruling party in the region get benefits under various schemes. This, if so, calls for immediate attention by the State Agriculture Department, as one's political identity cannot be a criterion for obtaining scares resources as benefits under various schemes.

Apart from the above two reasons, about 21per cent of non-beneficiaries expressed their annoyance regarding restrictions in the number of beneficiaries under NFSM scheme. This reflects that though some of the farmers wish to be included in the NFSM scheme, they are refused due to restrictions in the maximum number of beneficiaries of the scheme in a specific reason. It is also to be noted here that some of the non-beneficiaries (7%) were not interested about the scheme as marketability of the variety of seeds distributed under the programme (hybrid paddy seeds) appeared to be a major problem to them.

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

Sl. No.	Suggestions	% of the non-beneficiaries
1	BENEFICIARIES ARE POLITICALLY DECIDED	25
2	DON'T KNOW WHY	19
3	LACK OF KNOWLEDGE ABOUT THE SCHEME	28
4	LIMITED NUMBER OF BENEFICIARIES	21
5	NOT INTERESTED DUE TO NON-MARKETABILITY	7

5.5. Suggestions for the Inclusion of Non- Beneficiary for Availing Benefits under NFSM

In tune with the reasons for non-participation in the NFSM programme, a good proportion (26%) of non-beneficiaries suggested that the Government (both State Government and Central Government) should assign more importance on awareness campaigns, as many farmers do not know about the scheme. Some of the non-beneficiaries (20%) also suggested that the number restriction in the beneficiary farmer pool should be removed, or at least be increased matching the number of interested farmers. As before, some other non-beneficiaries (14%) also suggested that political identity of any farmers must not be a criterion for selection of beneficiaries under any scheme. A few others (6%) also suggested for promoting marketing assistance under NFSM scheme, as it is difficult to sell their product in the immediate post harvest period at low prices, especially when it is hybrid rice in variety.

However, it might also be noted here that some of the farmers appeared reluctant regarding the NFSM scheme as more than one-thirds (34%) of non-beneficiaries were unable to suggest ways of inclusion in the NFSM scheme to avail benefits. We may refer here that in Table 5.5, as much as 19 per cent of non-beneficiaries failed to answer why they are excluded from the scheme. These types of answers, indicating gross reluctance of some of the non-beneficiary farmers, to some extent reveal that there are ample opportunities of awareness campaign under the NFSM scheme, especially when many of the non-beneficiary farmers do not know how to become a beneficiary under the scheme and avail scares resources as benefits under 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	AWARENESS CAMPAIGN REQUIRED	26
2	BENEFICIARY POOL SHOULD BE EXTENDED	20
3	DON'T KNOW HOW	34
4	FREE & FAIR SELECTION OF BENEFICIARIES DESIRABLE	14
5	GOVT. SHOULD PROVIDE MARKETING SUPPORT	6

On the whole, it is revealed that there is a vast gap of knowledge between the programme implementing authority and those who got excluded from the scheme, which calls for immediate attention on awareness campaigns and selection mechanism of beneficiaries.

5.6. Summary of Chapter 5

This chapter, broadly speaking, aims at analyzing the factors influencing the decision making process of farmers regarding participation in NFSM programme. At the same time, this chapter tries to identify the constraints faced by the beneficiary farmers while availing benefits from the scheme. It also takes account of suggestions made by the beneficiary as also non-beneficiary farmers regarding further improvements in performance and reach of the scheme.

5.6.1. First, as farmers are often hesitant or reluctant in adopting something new or participating in a new government programme, it is important to identify the factors influencing the decision of farmers regarding participation in the NFSM programme. For this, we have carried out a logit regression analysis, taking participation in NFSM scheme as the dependent variable, while treating a number relevant of socio economic variables as independent variables (which might have impact on the decision making process of farmers regarding participation in NFSM). However, the result of our logit regression model fails to fit to our data, while a correlation coefficient matrix ascertains the results by ruling out the possibilities of multicollinearity problem that might affect the outcome of our regression model. The findings thus strongly indicate that there might be other factors at work, not included in our logit model, which

influences one's decision regarding participation in the NFSM scheme in the study region.

5.6.2. Second, in case of constraints in availing benefits under the NFSM scheme, it comes out that the performance of the scheme relating aspects like promptness in availing subsidy amount in relation to actual purchase of subsidized inputs, quality of inputs distributed, paper works for enrolling into the scheme, procedure for availing benefits, etc. remained satisfactory on the whole. The problems faced regarding the above mentioned aspects were reported only in specific areas for specific issues. Supportive measures like institutional financing and technical guidance was satisfactory also, as has been reported by the beneficiary farmers of the NFSM scheme. It, however, must be noticed here that there exists a huge information gap between the farmer households and the implementing authority of NFSM regarding proper knowledge of the scheme, eligibility criteria, etc. Concerned authorities may please note this and take proper steps to narrow down the prevalent information gap.

5.6.3. Third, in case of suggestions for improvement by the beneficiary farms, it is extremely important to note that about a half of the beneficiaries complained about timely distribution of inputs under the scheme, which needs to be addresses properly by the implementing authorities. Apart from this, there has been a strong suggestion for arranging marketing support for paddy by more than one-fourths of the beneficiary farmers, as marketing of hybrid varieties of paddy posed a major challenge to the farmers growing hybrid rice. The problem of marketability of paddy, especially the hybrid variety, has also been widely reported also by the non-beneficiary farmers. This strongly suggests that there has been an acute need for marketing support to be extended towards the farming community in general and towards the hybrid paddy growers in particular.

5.6.4. Lastly, though it is often quite challenging for the authorities to take farmers into confidence regarding participation in government programmes, it was time and again suggested by the non-beneficiary farmers that lack of knowledge regarding the scheme was one the leading factors behind non-participation in NFSM. This again calls for greater thrust on mass-campaigning about the scheme among the farming community. It may also be noted here that political interference has also been held responsible for non-participation in government programmes like NFSM, which needs to be neutralized for achieving greater participation of farmers in general.

CHAPTER 6

CONCLUDING REMARKS AND POLICY SUGGESTION

The National Food Security Mission programme was launched to enhance the productivity of rice, wheat and pulses to bridge the demand supply gap and ensure food security to the people. Since inception in 2007-08 (initial years of 11th plan) the programme has taken the shape of crop demonstration of improved verities of seeds associated with other components like making provisions for INM, IPM, improved farm implements etc. The NFSM programme called for implementation of cropping system centric interventions in a cluster approach in the agrarian sector through participation of farmers vis-à-vis the agricultural experts.

For a public sector scheme review of its performance is as important an aspect as the scheme itself. Hence, an evaluation study was carried out on the basis of primary survey in two districts of West Bengal to assess the impact of NFSM. The present study had some specific objectives of which we had discussed at length in our introductory chapter. In view of these objectives we shall now attempt to assess its impact among the beneficiaries of NFSM vis-à-vis the farmers who could not avail the NFSM benefits (i.e. the non-beneficiaries).

6.1. Concluding Remarks

The concluding remarks of the study specific to objectives spelt out earlier are presented here as follows:

6.1.1.1. District wise secondary data on area, production and yield of rice, wheat and pulses were analyzed to get an overall picture of the state. It came out that the productivity of rice and wheat has increased over the 11th plan. During the last plan productivity of rice has increased from 25.73 quintal/hectare in 2007-08 to 27.44 quintal/ hectare in 2011-12 and the productivity of wheat has increased from 26.02 quintal/ hectare in 2007-08 to 27.65 quintal/hectare in 2011-12. This may point towards a successful implementation of the program. But in case of pulses, productivity responses seemed to be fluctuating over the years.

6.1.1.2. No major change in net sown area and gross cropped area was observed. There was almost no enhancement in the area under cultivation. However, net and gross irrigated area along with fertilizer consumption revealed substantial augmentation.

6.1.1.3. Variation in productivity of crops across districts in West Bengal over the years from 2007-08 to 2011-12 was analyzed with district level data. It turned out that the average annual growth rate of rice in the NFSM districts was higher as compared to the same for non-NFSM districts during 11th plan. On the contrary productivity response of wheat in the NFSM districts in general was lower than the non-NFSM ones in the same period. However, the districts covered under wheat programme had a very poor productivity of wheat during 9th and 10th plans. During the 11th plan productivity of the crop in these districts geared up. NFSM pulses programme covered all the districts of the state. But no conclusive judgment can be made as there is wide variation among the districts in terms of productivity of pulses.

6.1.1.4. During the 11th plan financial achievement towards NFSM target in West Bengal accounted for over 67 per cent.

6.1.1.5. Component specific allocation of funds reveals that crop demonstration and subsidy were given foremost priority. Allocation towards micro nutrients, plant protection chemicals and chemicals for soil amelioration were close followers.

Productivity of rice in particular has responded positively to NFSM programme in West Bengal. Financial achievement was on the better side registering about two-third utilization. Component specific outlay centered around crop demonstration, plant protection and nutrition.

6.1.2.1. The average size of household was 5.0 and 5.4 for NFSM and non-NFSM families respectively. Literacy rate among the respondents accounted for around 77 per cent in both the groups of farmers. Out of 300 NFSM farmers over 46 per cent were from scheduled and backward caste families. The similar proportion for non-NFSM households was 40 per cent.

6.1.2.2. Both NFSM & non-NFSM respondents were mostly marginal farmers (95% & 91% respectively) where about one third of the total members are engaged in farming activities. Average operational holding size comes out as 1.01 & 1.19 acres for B & NB farmers respectively. There is not much of a difference in irrigation intensity (II) and cropping intensity (CI) between the two groups.

6.1.2.3. Crop enterprise among both the groups is dominated by rice where proportion of rice in GCA is 83 per cent among NFSM farmers and 90 per cent among non-NFSM farmers. Yield rate of rice is just over 18 quintals per acre for both the groups. The overall average annual family income from all sources of the sample households is Rs. 31730.59 for beneficiary farmers, whereas it is Rs. 32538.93 for non-beneficiary farmers in the study area.

6.1.2.4. Average value of farm assets was to the tune of Rs.8626.57 for NFSM and Rs. 5670.75 for non-NFSM farmers. On the other hand, productive credit per beneficiary household was Rs.20840.50 while it was Rs.30592.59 for non-beneficiaries.

In this study, the beneficiaries of NFSM programme and non-NFSM farmers exhibit similar socio-economic and agricultural profile and hence, results seem comparable between the treatment and control groups.

6.1.3.1. It was found that the farmers in general (both NFSM and non-NFSM) were aware about the NFSM programme. It is revealed from the data that the state department of agriculture has been instrumental in imparting awareness among the farmers regarding NFSM. However, fellow farmers and friends along with progressive farmers (in Howrah) played an important role in this connection too. Enhancements of awareness through print and electronic media have had little impact.

6.1.3.2. Amount of subsidy on seeds distributed to the beneficiary farmers in aggregate accounted for 92 per cent of the total cost on seed. Costs on PPC, INM and IPM per beneficiary households accounted for 86.1 per cent, 60.81 per cent and 24.67 per cent of respective costs. Distribution of seeds, plant protection chemicals (PPC) and measures regarding integrated nutrient management (INM) were undertaken at a significant scale.

6.1.3.3. No improved farm equipments were provided to the NFSM farmers for the fact that the programme was launched in the area for first time in 2013-14.

6.1.3.4. Out of 300 beneficiary farmers, 88.7 per cent had the opinion that the new and improved variety has been effective in increasing the productivity of rice. Farmers seemed to be quite happy with the productivity response of the supplied seed.

6.1.3.5. In terms of quantum of production of rice per acre the NFSM farmers have a clear edge over the non-beneficiaries. Moreover, as subsidy amount is deducted from the total cost net return from rice cultivation of the beneficiary households increase substantially than their non-beneficiary counterpart.

6.1.3.6. A substantial part total output of paddy, barring summer crop by NFSM beneficiaries of Debra, is being sold out by all categories of farmers. Retention of the produce by the beneficiaries in Debra is strikingly high. It should be remembered that hybrid seeds (ARIZE 6444) were distribute in this region for crop demonstration. The coarse grain from hybrid paddy posed hindrance in marketing the output. At the same time, the local traders remained disinterested in purchasing the hybrid produce as the rice millers did not accept such a meagre quantity. In the scenario of marketing, the local merchants play the key role.

The NFSM technology with its provision of subsidized improved seeds, INM and IPM measures has had its impact in increasing productivity and income of the beneficiary farmers. The respondents seemed to be quite satisfied with its productivity response but at the same time they were unhappy as regards to the market prospects of hybrid seeds.

6.1.4.1. To identify factors influencing the adoption of NFSM we have carried out a logit regression analysis, taking participation in NFSM scheme as the dependent variable. However, the result of our logit regression model fails to fit to our data, while a correlation coefficient matrix ascertains the results by ruling out the possibilities of multicollinearity problem that might affect the outcome of our regression model.

The findings strongly indicate that there might be other factors at work, not included in our logit model, which influences one's decision regarding participation in the NFSM scheme in the study region. We propose further research in this area.

6.1.5.1. It comes out that the performance of the scheme relating aspects like quality of inputs, paper works for enrolling into the scheme, procedure for availing benefits, etc. remained more or less satisfactory on the whole. But there exists a huge information gap

between the farmer households and the implementing authority of NFSM regarding proper and comprehensive knowledge of the scheme, eligibility criteria, etc.

6.1.5.2. It is extremely important to note that about a half of the beneficiaries complained about timely distribution of inputs under the scheme.

6.1.5.3. There has been a strong suggestion for arranging marketing support for paddy by more than one-fourths of the beneficiary farmers, as marketing of hybrid varieties of paddy posed a major challenge to the farmers growing hybrid rice.

6.1.5.4. It was time and again suggested by the non-beneficiary farmers that lack of knowledge regarding the scheme was one the leading factors behind non-participation in NFSM.

It appeared that there exists a huge information gap regarding proper and comprehensive knowledge of NFSM. Complains were received about timely distribution of inputs. There was suggestion for arranging marketing support for paddy specially hybrid varieties.

6.2 Policy Suggestions

On the basis of the findings of this study and concluding observations, the following recommendations and policy suggestions are proposed:-

6.2.1. West Bengal has exhibited a high potential for yield enhancement of rice in particular and wheat to a certain extent. Pulses, though fluctuations are observed, might have potential for augmentation of yield. There remains a huge scope to exploit this potential through technology dissemination programme like **NFSM** and hence the **programme should continue with greater effort**.

6.2.2. Interventions through crop demonstrations coupled with INM and IPM practices have helped the farmers in reaping the benefits in view of increase in productivity and income from crop enterprise. Such **demonstration programmes should be encouraged**.

6.2.3. An all round effort should be made to **ensure the timeliness of input delivery system** prescribed under the recommended technology.

6.2.4. It is **very necessary** for further growth **that improved farm implements are distributed** among the beneficiaries. Implements once distributed could be used and

taken care of by the farmers' own organizational arrangement on sharing basis. This may boost the attitude of co-operation among the farmers.

6.2.5. There exists an information gap as to comprehensive knowledge of NFSM. A **widespread knowledge about such programmes is required for developing responsiveness** among farmers.

6.2.6. Seed minikits that are being distributed for crop demonstration **may be in line with the consumption basket of the locality**. For people are generally reluctant to adopt new food habit.

6.2.7. Marketing of produce seemed to be one of the major problems in the agrarian sector. And private local traders dominate the scenario. **Marketing co-operative societies could be formed by the farmers** themselves in localities. Panchayats may also initiate formation of such societies.

6.2.8. In course of the study we had the impression that the programme implementation followed a sort of top-down approach. For it was expressed by a large section of non-beneficiaries having no knowledge about the scheme. **Widespread awareness** in the locality (irrespective of whether an intended beneficiary or not) **is necessary and participation at the grass root** may raise the local needs and **create an environment for a bottom-up planning process**.

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APPENDIX

Table I: Sources of awareness of NFSM among the sample beneficiaries in CD Blocks

		% of beneficiaries aware about NFSM							
District		Howrah district				West Medinipur district			
Block		Amta		Domjur		Debra		Medinipur Sadar	
		Yes	%	Yes	%	Yes	%	Yes	%
Sl	Sources of Awareness								
1	News Paper	0	0.0	0	0.0	0	0.0	0	0.0
2	Agrl. Department	37	49.3	2	2.7	54	72.0	40	53.3
3	SAU	2	2.7	0	0.0	0	0.0	0	0.0
4	KVK	0	0.0	0	0.0	0	0.0	0	0.0
5	RSK	0	0.0	0	0.0	0	0.0	0	0.0
6	Farmers/ Friends	22	29.3	40	53.3	26	34.7	24	32.0
7	Input Supplier	0	0.0	0	0.0	0	0.0	0	0.0
8	Radio/TV	0	0.0	1	1.3	0	0.0	0	0.0
9	Ag. Exhibition	0	0.0	0	0.0	0	0.0	0	0.0
10	ZP/TP/GP	15	20.0	2	2.7	33	44.0	47	62.7
11	Any Other (Progressive Farmer)	16	21.3	30	40.0	0	0.0	0	0.0

Table II - Particulars of benefit availed (2013-14) across CD Blocks

Districts	Benefit Type	No.of HH	T.Cost/HH	T.Subidy/HH	% of Subsidy
	Seed Minikit				
Howrah	Amta I	75	346.56	341.12	98.4
	Domjur	75	319.45	315.77	98.8
Medinipur	Medinipur Sadar	75	636.71	503.15	79.0
	Debra	75	507.63	507.63	100.0
	PPC				
Howrah	Amta I	75	654.76	609.17	93.0
	Domjur	75	584.96	556.27	95.1
Medinipur	Medinipur Sadar	75	768.62	539.42	70.2
	Debra	34	405.38	341.63	84.3
	INM				
Howrah	Amta I	75	334.43	334.43	100.0
	Domjur	75	316.35	316.35	100.0
Medinipur	Medinipur Sadar	27	3579.20	1446.85	40.4
	Debra	13	111.19	111.19	100.0
	IPM				
Howrah	Amta I	0	0.00	0.00	0
	Domjur	0	0.00	0.00	0
Medinipur	Medinipur Sadar	39	1000.77	246.92	24.7
	Debra	0	0.00	0.00	0
	Other				
Howrah	Amta I	73	1880.41	342.47	18.2
	Domjur	39	1858.72	341.03	18.3
Medinipur	Medinipur Sadar		0.00	0.00	0.0
	Debra		0.00	0.00	0

Table III – Proportion of beneficiary households reporting

Benefit	**Howrah**		**Medinipur**	
Increase in Productivity	Amta I	Domjur	Debra	Medinipur Sadar
Seed	85.33	90.67	86.67	92.00
PPC	30.67	82.67	33.33	60.00
INM	56.00	34.67	9.33	12.00
IPM	0.00	0.00	0.00	24.00
Fall Material Cost				
Seed	68.00	65.33	84.00	58.67
PPC	25.33	33.33	9.33	36.00
INM	0.00	0.00	0.00	0.00
IPM	0.00	0.00	0.00	26.67
Fall in Loss				
Seed	0.00	0.00	0.00	0.00
PPC	33.33	32.00	25.33	30.67
INM	56.00	36.00	5.33	26.67
IPM	0.00	0.00	0.00	21.33

Table IV - Cost and Returns of Rice per acre in Kharif 2013-14 by district and block

Kharif Rice	Medinipur	
	Medinipur Sadar	
	NFSM	Non-NFSM
Gross Income	22461.79	23018.78
Total Cost	16974.17	15589.37
Net Income	5487.62	7429.42
Total Subsidy	2284.00	0.00
Net Income with Subsidy	**7771.61**	7429.42

Table V - Cost and Returns of Rice per acre in Summer 2013-14 by district and block

Summer Rice	Howrah				Medinipur	
	Amta I		Domjur		Debra	
	NFSM	Non-NFSM	MFSM	Non-NFSM	NFSM	Non-NFSM
Gross Income	37902.74	38047.06	38424.04	38437.97	47387.57	35767.84
Total Cost	22095.43	19811.99	22332.32	21268.13	21840.15	22051.78
Net Income	15807.30	18235.07	16091.72	17169.85	25547.42	13716.07
Total Subsidy	2813.68	0.00	2541.04	0.00	2763.95	0.00
Net Income with Subsidy	**18620.98**	18235.07	**18632.76**	17169.85	**28311.37**	13716.07

Table VI – Proportion of Total Production (Value) Sold

Blocks	Krarif		Summer	
	% of total production sold		% of total production sold	
	NFSM	Non-NFSM	NFSM	Non-NFSM
Amta I			70.9	82.9
Domjur			69.1	82.4
Debra			**17.6**	83.7
Medinipur Sadar	80.6	83.3		
Total	**80.6**	**83.3**	**58.5**	**83.0**

Table VII – Marketing Channels of Output

Block	Sold to	Kharif		Summer	
		% of total production sold		% of total production sold	
		NFSM	Non-NFSM	NFSM	Non-NFSM
Amta I	Merchant			100.0	100.0
Domjur	Local Market			1.3	
	Merchant			98.7	100.0
Debra	Local Market			58.4	48.8
	Merchant			41.6	51.2
Medinipur Sadar	Local Market	13.2	34.5		
	Merchant	86.8	65.5		
Total	Local Market	**13.2**	**34.5**	**4.4**	**22.8**
	Merchant	**86.8**	**65.5**	**95.6**	**81.4**

ANNEURE I

Coordinator's Comments on the Draft Report

" Impact of National Food Security Mission (NFSM) on Input use, Production, Productivity and Income in West-Bengal"

Submitted by

Agro-Economic Research Centre, Santiniketan West Bengal

1. **Title of the draft report examined**

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

2. **Date of receipt of the Draft report**: 30th May 2015

3. **Date of dispatch of the comments**: 26th June 2015

4. **Comments on the Objectives of the study**

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

5. **Comments on the methodology**

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

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

   General remarks

   - **Chapter I**: Table 1.1and 1.2 are only structures. Data has to be filled. It would be better if entire chapter is restructured as per the chapter plan and table templates which were provided to you (attached).
   - **Chapter II**: Discussion/justification for certain findings is needed. For instance: reasons for not allocating funds in the later part of 11th plan for some districts which was discussed for Table 2.8. There are inconsistencies in the figures among the related tables. For example the total of figures shown in Table 2.7,2.8 and 2.9 differs.
   - **Chapters III**: Results of the chapter three indicates that the performance of non-beneficiaries on few parameters like agricultural income is better than beneficiaries. It will be useful if reasons could be traced. While discussing on education status there is no differentiation between beneficiary and non beneficiary HHs. While discussing computed results may avoid words like 'appears' used in explaining about operational area. Table 3.6 (a), per acre values are to be calculated by dividing the total values by net sown area and

not by gross cropped area. The correct values are given below highlighted by yellow collour see below.

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)	62480.74	61760.2	65753.84	55218.21
Cost of Production	40314.65	39849.74	41576.20	34914.51
Net returns (Farm business income)	22166.09 (69.86)	21910.47	24177.63 (74.30)	20303.69
Non-farm Income	9564.50 (30.14)	-	8361.30 (25.70)	-
Total Income	31730.59	31364.67	32538.93	27325.27

- **Chapters IV and V**: Table 4.3, and 4.4 is not needed since agricultural implements were not supplied. Table 4.5 should be the per cent of beneficiaries who received. Comparative discussion of Table4.6 and Table 4.7 in one para may be attempted.
- Decimals may be omitted while providing values in rupees.
- In some tables absolute numbers are given. Instead of that, per cent to total sample or per HH, as may be the case, would be better as followed by other states.
- Wherever significant results are presented in chapters pertaining to survey results, discuss results with field experience gained during data collection and with existing literature relevant to results.
- More discussion on summaries, conclusions and policy suggestions on each chapter would benefit in drafting consolidated report.
- There is ample scope for correction of errors, improvement of the grammar and language. Hence proofread the report carefully before submitting to us and to ministry.

Specific remarks

The specific comments / suggestions are provided in the draft report (word file) sent by you(attached). The file sent as a track change commented file. Please send the revised report after incorporating all comments.

7. Overall view on acceptability of report

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

ANNEXURE II
Action Taken Report

Agro-Economic Research Centre, Visva-Bharati

Action on comments :

Chapter I - Data has been filled in Table 1.1 and 1.2. It was missed due to some software problem during formatting the draft report. The chapter is restructured as per the chapter plan.

Chapter II – Discussion on findings has been elaborated.

Chapter III - Results of the chapter three indicates that the performance of non-beneficiaries on few parameters like agricultural income is better than beneficiaries. All the other points were incorporated in the report.

Chapters IV and V - Tables 4.3 and 4.4 have been omitted. Necessary corrections in Table 4.5 have been done. Comparative discussion of Table4.6 and Table 4.7 as regards to expenditure on irrigation has been attempted in a separate paragraph.

All the other comments were addressed and necessary changes were incorporated in the report.