

## **EXECUTIVE SUMMARY**

### **Introduction**

The Government of India has launched National Food Security Mission (NFSM) during 2007-08 under two components in Karnataka State namely, NFSM (Rice) and NFSM (Pulses) is a centrally sponsored scheme being implemented in the state from 11th plan period (2007-2008 to 2011-2012). The program is continued during 12th plan to achieve additional production of 10 lakh tones of rice and 2 lakh tones of pulses through area and yield enhancement to achieve food security. The Mission has been in implementation in 7 districts under rice and all 30 districts under pulses. An impact evaluation study of the programme for the period of 2007-08 to 2013-14 has been carried out by the Institute of Public Enterprise (IPE) at the instance of the Karnataka Evaluation Authority (KEA), Government of Karnataka. The study was conducted in 11 districts that is 4 for rice and 7 for pulses. A sample size of 1100 respondents from 110 villages at the rate of 10 farmers per village inclusive of both beneficiaries (9) and non-beneficiaries (1) were taken for primary study. The sample included different categories of farmers like OC/SC/ST/BC/Women/Minority/Small/Medium/Big to assess the benefits of NFSM scheme to all the interested groups of the farmers. The data was collected from the implementing agencies, farmers - both beneficiary and non-beneficiary using various questionnaires and other participatory methods. The data was analyzed using appropriate analytical tools.

### **Implementation of the Scheme**

An autonomous agency named State Agriculture Management Agency (SAMA) is implementing the scheme under the guidance of the State Food Security Mission Executive Committee (SFSMEC). In all sample districts, District level Food Security Mission Executive Committees (DFSMEC) were constituted for NFSM implementation and monitoring through the department of agriculture. The systems and procedures devised in the transfer of funds are reported to be simple and efficient. Separate accounts for the scheme are maintained by the State and the District level and the funds are transferred through 'electronic banking/RTGS'. The annual accounts are duly audited by a chartered accountant on time. There were no complaints at district level on the receipt of funds.

A State level Project Management Team (PMT) is constituted and is functioning under the leadership of the State Mission Director and district level teams under the respective district Joint Directors of Agriculture. PMTs have been constituted in all the sample districts with consultants and technical assistants as and when the approval of the same is accorded by the Government of India (GOI).

## State Level Area, Production and Yield

**A. Rice:** The production during base year was 36.45 lakh tones and it increased to 40.52 lakh tones in 2013-14. The productivity levels have increased to 15.78 percent. The area under rice cultivation decreased from 13.95 lakh hectares (2006-07) to 13.40 lakh hectares (2013-14) that is by 3.99% over base year. The decline in area is due to conversion of area under rice to crops like maize and ginger and plantations like coconut and areca nut. These alternative crops/plantations fetch remunerative price and require lower level of water and labor. The Government of Karnataka has declared drought affected during the year 2012-13 and it has an impact on the area, production and productivity of rice. There would have been higher production if all districts were covered under NFSM.

- **NFSM Districts:** The area has remained almost same but production and productivity levels have increased in NFSM districts. In Non-NFSM districts area decreased but production and productivity under rice increased marginally.

**B. Pulses:** The production and productivity levels of the pulses have increased significantly with about 58.66% and 95.53% respectively. The increase in area was only 8.21% over the base year. The average yield obtained during 2013-14 was 745 kg per ha as compared to 381 kg per ha yield in the base year 2006-07 shows a positive growth. The production during base year was 8.38 lakh tones and it increased to 13.31 lakh tones during 2013-14. An increase of 4.93 lakh tons production over the base year in pulses was more than double the targeted 2 lakh tones.

- **NFSM Districts:** All the 30 districts were covered under NFSM-Pulses and recorded an increase 58.66 percent production and 95.53 percent productivity over the base year 2006-07.

## Targets and Achievements

- Funds **utilized** are Rs. 305.07 crore against the budget allotted Rs 376.74 crore to rice and pulses for the study period (2007-08 to 2013-14) that is an achievement of 80.97%.
- Funds allotted for rice are Rs 101.55 crore and utilize Rs 67.57 crore (66.53%).
- Funds **allotted** for pulses are Rs 275.19 crore and utilized Rs 237.50 crore ( 86.30%).
- **Sample Districts:** The overall position in the utilization of funds was Rs 208.49 crore against the released Rs 246.58 crore that works out to be 84.95 percent achievement.
- **Main Interventions:** A total amount of Rs.204.11 crore released to sampled 11 districts during the period of 2007-08 to 2013-14 for the major interventions against which an amount of Rs 175.76 crore (86.11%) was utilized.
- **Other interventions:** An amount of Rs 32.73 crore spent against the released Rs 42.47 crore to other miscellaneous expenses for components like project management teams,

award for best performing district, capacity building, Accelerated Pulses Production Programme (APPP) etc. The performance of Gadag district with 100% utilization of the funds can be rated as excellent, Dharwad (99.32%), Gulbarga (91.58%) and Yadgir (90.83%) with more than 90% achievements rated 'very good', Bidar, Bijapur, Raichur, Shimoga with above 80% rated as 'good', Belgaum (57.81%), Udipi (54.98%) and Hassan (49.09%) performance was average.

## **Primary Survey Report**

### **A. Demographic Details**

- **Gender and Age:** The proportion of male among the sampled respondents is 90 percent. The **majority** of the respondents (45.40%) are in the age group of 40 years and above.
- **Social Group:** About 63% of the respondents selected for the present study are from OC/General category, followed by 14.90% BC, 10.40% SC, 6.90% ST and 4% minorities.
- **Education:** The study reports 31.50% respondents are secondary school educated, followed by 30.90% primary school educated, 17.50% illiterate, 13.40% intermediate educated, and the remaining 6.90% are graduates.

### **B. Execution**

- **Selection of the Area and Beneficiaries:** A large number of respondents reported selection of fields were as per the needs and suitability. The selection of beneficiaries was on participatory mode.
- **Inputs supply:** The inputs supply was mostly on time with proper planning and advanced tie-up with manufacturers and suppliers.
- **Transfer of Technology:** Almost all respondents were very happy with the technical support extended by the department. The involvement of subject experts in the transfer of technology was good.

### **C. Impact:**

- **Sustainability:** Continuity of improved package of practices is an indication of its sustainability for any developmental program. The survey reveals 52.70% will continue all practices recommended under the mission, followed by 36.10% continue Top two essential practices, 10.40% continue Top one main practice.
- **Impact on Area-Increase:** One of the major objectives of the scheme is that the area under rice and pulses should increase. There was slight increase in area due to NFSM interventions in surveyed villages. About 56.80% sample respondents have reported increase as 'little more area' under rice and pulses due to NFSM interventions.

- **Impact on Yield:** The major objective of the mission is to increase the yields of rice and pulses with the NFSM interventions. The survey findings revealed that there was a significant increase in the productivity of rice and pulses. From the survey, 49.39% respondent's yields have increased by 10-15%, 36.06% respondents yields increase was 5-10% and 15.66% respondents yields were more than 15% due to NFSM interventions.
- **Non-beneficiaries yields:** The study found 46.36% non-beneficiaries yields were less than NFSM beneficiaries. However 32.73% non-beneficiary farmers felt their yields were at par with the yields of NFSM beneficiaries.
- **Impact on Income:** NFSM has greatly helped the farming community in the overall economic upliftment. The majority (57.88%) respondents reported 5-10% increase in their income, followed by 27.67% with more than 10% increase and 13.33% respondent's income increased marginally.
- **Social Impact:** The survey report found 54.24% respondents used higher income for better education and 35.05% used for better nutritive food to their children.
- **Major Contributors for Higher Income**

The seed treatment has significantly contributed for higher yields in four surveyed districts such as Bidar, Gadag, Raichur and Yadgir. The next best intervention in the enhancement of yields was the use of improved variety seeds in pulses and hybrid seeds in rice.

Integrated Nutrients Management (INM) with the use of micronutrients like zinc, boron and soil ameliorate gypsum and lime have contributed considerably in the improvement of soil fertility and to attain high yields in several surveyed districts. Farm equipments (FE) role is also substantial in the enhancement of income.

#### **D. Intervention Specific Findings**

There were mainly 7 interventions such as Demonstrations, Seed Supplies, Integrated Nutrient Management (INM), Integrated Pest Management (IPM), Farm Equipments, Water Application Tools and Trainings during the study period 2007-08 to 2013-14. The overall financial performance of all the study districts put together, farm equipments with the distribution of knapsack sprayers, cono-weeders, rotavators, power weeders, multi-crop threshers and seed drills was quite good with 96% achievement. The performance of water application tools in the distribution of irrigation pump sets, sprinklers, pipes etc. with 82% and demonstrations with 81% against targets was also good.

- **Demonstrations:** The improved technical practices in rice demonstrations such as transplanting of young seedlings of 12-15 days on singly in a space of 25x25 cm, using of

green manure has been largely contributed for better yields in rice. Seed treatment with *Trichoderma* contribution was significant in the enhancement of yields in pulses.

- **Seed supplies:** The yield obtained by the use of high yielding variety seeds in pulses and hybrid seeds in rice recorded a significant 10-15% increase in 53% respondent's fields, followed by 5 to 10% increase in 37% beneficiaries fields over the traditional/old varieties. Hybrid KRG-4 replaced traditional varieties of rice to the extent of 15-20% area in Shimoga district.
- **Integrated Nutrient Management (INM):** Application of lime in acidic soils gave tremendous response in the correction of soil pH and improvement of soil fertility. The yield obtained from the gypsum treated plots under NFSM-pulses recorded a considerable increase.
- **Integrated Pest Management (IPM):** As many as 97% respondents reported yield gain of 5 to 15% with IPM over non-treated plots. Many respondents reported of good results with *Emamectin benzoate* application in pest control as compared to other pesticides.
- **Water Application Tools:** The pump sets and pipes supplied to the rice and pulse growing farmers have created considerable additional irrigation facilities. The water use efficiency improved with sprinkler sets, drip system and other water application tools.
- **Supply of Farm Equipments:** The use of farm equipments had brought savings both in time and money to the beneficiary farmers over the traditional methods. Apart from savings in time and expenditure, the use of farm equipments has also ensured timely farming operations. Tillers, mechanical sprayers, weeders, transplanters have contributed significantly in all districts in general in the mechanization of farming and it was more particular in labor scarcity districts like Shimoga, Udipi, Belgaum and Hassan.
- **Trainings:** Overwhelming majority (90%) respondents expressed their satisfaction with the quality of training. Every respondent informed that the training programs were useful and it has contributed for higher yields.

## **Selected District and Crop Wise Findings**

### **1. Rice**

The overall physical and financial achievements were 70.12 and 63.77 percent respectively. The extent of achievements however varied among different districts.

- **Udipi:** Majority of the respondents (96%) reported 5 to 15% yield increase in rice under NFSM as compared to control. The increased productivity and income of 43% respondents used for better nutritive food. Majority of the respondents felt that the best gain from NFSM was the lime application to improve soil fertility. A large number of non-beneficiaries (70%)

were not aware of NFSM. Labor shortage, wild animals menace mainly with monkeys, bison and peacocks are serious problems in Udipi district.

- **Shimoga (Shivamogga):** The survey reported with 73.30% sample respondents rating on increase in area as “little more”, 82.20% respondent’s yields increase was 5-15% and 65.60% reported 5-10% increase in their income. About 55.60% respondents could afford better education to their children due to increased income with NFSM interventions. Hybrid paddy, line planting, machine transplantation, green manure has contributed significantly for higher yields. Problems are *Bacterial Leaf Blight* disease and lack of remunerative market price to rice.
- **Hassan:** The survey findings revealed that there was marginal increase in the productivity and income due to NFSM interventions. Majority of the respondents used the extra income for better nutritive food. Machine transplantation, zinc, lime application are major contributors for higher productivity and income. Area under rice has come down due to delay in the release of water under Command Area and shifting of a large area under rice to other remunerative crops like ginger.
- **Belgaum (Belagavi) :** Majority of respondents reported increased area under rice as ‘little more’, production increased to the extent of 10-15%, and income increased to 5-10%. Majority of the respondents used extra income for better medical treatment and children education. Major contributors for higher income are hybrid paddy seed, intercultivator, rotavator, diesel engine and micronutrients.

## 2. PULSES

The levels of physical achievements against targets for the period 2007-08 to 2013-14 for pulses were reasonably good. District wise details are given under:

- **Bidar:** The study reported significant increase in area under pulses, 10-15% increase in yields and 5-10% increase in income. Beneficiaries have used extra income for better nutritive food and children education. *Trichoderma viridi* was the major contributor in maintaining appropriate plant population with decreased seedlings mortality at the initial stages of crop and resulting into higher productivity. Major problem is the less than 10 year old varieties seed distribution norm. A portion of area under pulse crops has been shifting to soyabean cultivation because of better market price for soyabean. About 80 percent of the non-beneficiary respondents revealed that their yields were less than NFSM beneficiaries and the balance 20% expressed that their yields were at par with NFSM beneficiaries.
- **Gulbarga:** Majority respondents got 5-10% increased yields and income. The extra income was used for the better education of their children. Major intervention that has contributed for

higher productivity is Integrated Nutrition Management (INM). A part of the area under pulses has been converted to cotton.

- **Bijapur (Vijayapura):** The majority of NFSM beneficiaries reported 5-10% increase in production and income and it was used for the better education of their children. The non-beneficiaries were not adopting the improved technologies due to lack of awareness and 84.4% of them felt that their yields were less than NFSM beneficiaries.
- **Gadag:** The yield increase of 10-15% was reported by 72.20% respondents. About 86.70% reported 5-10% increase in their income and it was used for better education of their children. The major contributors for higher yields are *Trichoderma* seed treatment followed by Integrated Nutrient Management (INM) component with the application of boron, zinc and gypsum. The non-beneficiary farmers, 60% indicated that their yields were less than NFSM beneficiaries, 30% farmers yields were at par. The balance 10% felt it was far less yields than the NFSM fields.
- **Dharwad:** The increase in the yields due to NFSM interventions was 10-15% for 68.10% of the sample respondents, followed by 5-10% increase for 21.80% beneficiaries. About 47.80% respondents reported more than 10% increase in their income followed by 31.10% reported 5 to 10% increase. The increased income was used for better nutritive food and education. Jaki variety of bengal gram contributed for 10% increase in yields and it has replaced A1 variety. Seed treatment and micronutrients have also contributed significantly in the productivity enhancement of pulses in Dharwad district.
- **Yadgir:** As many as 85.60% reported that the increase in yields due to NFSM interventions was 10-15% and the remaining 14.40% opined 5-10% increase. The majority 84.40% respondents reported 5-10% increase in their income and the balance 15.60% reported more than 10% increase in their income. Majority respondents used higher income for the better education of their children. The *Trichoderma* seed treatment and micronutrients have contributed significantly for the higher yields.
- **Raichur:** There was a significant increase in the productivity and 50% beneficiaries believe that the increase was 5-10% followed by 31.10% beneficiaries 10-15% increase, and 18.90% view more than 15% increase in yields. The majority (60%) respondents have reported 5-10% increase in their income. As many as 76.70% respondents used higher income for better education of their children. Seed treatment with *Trichoderma* contributed significantly in the enhancement of yields.

## **Employment**

The implementation of NFSM scheme in the different districts generated more employment opportunities mainly due to increase in production which requires more of the labor for different operations. Farm equipments and water application tools supplied under NFSM are being used not only for rice and pulse crops but also for all crops and plantations. The year round field work with the cultivation of different crops has generated more employment in villages. On the other hand, mechanization in agriculture provided indirect employment to skilled and unskilled persons engaged in operation, repair and maintenance of farm equipments.

## **Convergence**

All the districts have reported convergence of Mission interventions with different schemes of the State level programmes. Most of the selected districts have converged with Boochetana, ATMA, Farm Mechanization, Rashtriya Krishi Vikas Yojana with NFSM Scheme.

## **Forward and Backward Linkages**

Government Input supply Agencies like Karnataka State Seeds Corporation Ltd (KSSC), Karnataka State Cooperative Marketing Federation Ltd (KSCMF) and Private Farm Machinery and Micro Irrigation system agencies have been associated in backend operations for the supply of high quality agricultural inputs to farmers.

The department of agriculture has been providing marketing information to farmers and linking up with established Market Yards through Agricultural Produce Market Committees to ensure remunerative price for farm products including procurement under Minimum Support Price (MSP).

## **Suggestions and Recommendations**

### **(A) Short Term practicable recommendations**

1. Age limit of seeds of varieties of pulses, hybrids of rice released within 10 years for demonstrations and seed distribution components may be relaxed beyond 10 years.
2. May take necessary steps to have same amount of subsidies for farm equipments and water application tools under different schemes.
3. Timely release of rate contract agreements may be ensured for timely procurement and distribution of inputs to farmers.
4. The beneficiary of one intervention may not be given another intervention benefit in the same season to reach the benefits of NFSM to large number of farmers.

5. There may be a relaxation on conducting of 100 hectares extent of demonstrations in contiguous blocks in a village as it is difficulty in certain districts like Hassan, Udipi etc.

**(B) Long Term practicable recommendations**

1. While fixing the targets, it is suggested to consider the opinions of field level implementing officers for need based components.
2. Integrated farming may be encouraged.
3. Agricultural Universities and Research Institutes have to play an important role in bring out high yielding hybrids and varieties suitable to local conditions. Also make sure enough quantities of seeds are made available in association of State Seeds Corporation.

**(C) Recommendations requiring change in policy**

1. It is essential to work out area wise need based assessment and prepare district-wise requirements specific to those regions needs instead of general allocation of funds for common component-wise allotment to all districts.
2. May use an appropriate Technology (IT/MIS/GIS) for better monitoring of the project implementation.
3. It is suggested that the provisions may be made in future for concurrent monitoring and evaluation of such schemes.