

Working Paper 2015/02

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

R.A. Dutta, S. S. Kalamkar & M. R. Ojha

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Agro-Economic Research Centre

For the States of Gujarat and Rajasthan

(Ministry of Agriculture, Govt. of India)

Sardar Patel University

Vallabh Vidyanagar, Dist. Anand, Gujarat

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


R.A. Dutta, S. S. Kalamkar & M. R. Ojha¹

I. Background

Global agri-food systems are undergoing a rapid transformation towards higher-value products, stricter food standards and closer international and vertical integration. The ramifications for trade flows, industry structure, competitiveness, and social welfare may be far reaching but are not yet well understood. Developing countries like India in particular face technical and institutional constraints, potentially impeding a successful participation in emerging value chains. This may have implications for poverty, food security, and sustainable development. The global food and nutrition security is in question today with ever-increasing food prices resulting from adverse climatic effects on agricultural production, rise in oil prices, increasing use of grains for biofuels and significant reduction in public spending on agricultural sector over the last three decades. At the same time, world has experienced an unprecedented increase in population during the past century, with a billion people added every decade during the last three decades alone.


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¹Agro-Economic Research Centre (*Ministry of Agriculture, Govt. of India, New Delhi*), Sardar Patel University, Vallabh Vidyanagar 388120, Anand, Gujarat (email-director.aerc@gmail.com).



Thus, changes in food availability, rising commodity prices and new producer–consumer linkages have crucial implications for the livelihoods of poor and food-insecure people (Braun, 2007). In fact, global food prices witnessed a very sharp increase in 2007 and they continue to rise. Initially it was thought that the increase in food prices was a part of their cyclical nature, aggravated by the adverse impact of weather on production in some parts of the world. However, the continuing surge and the high level of global food prices seen so far till 2008 make it abundantly clear that the recent trend cannot be attributed to any volatility of international prices and there are fears that food prices may stay at these levels or may rise even further. The increase has been particularly very sharp for staple foods. Since 2007, two rounds of food price hikes have contributed to millions of people being hungry or malnourished (IFPRI, 2011). These increases in prices of staple foods have led to emergencies and rationing in a large number of countries and there are frequent reports of food riots from various parts of the globe (Chand, 2008), particularly in under-developed and developing countries and the picture is turning gloomier day by day. This is causing worldwide concern.

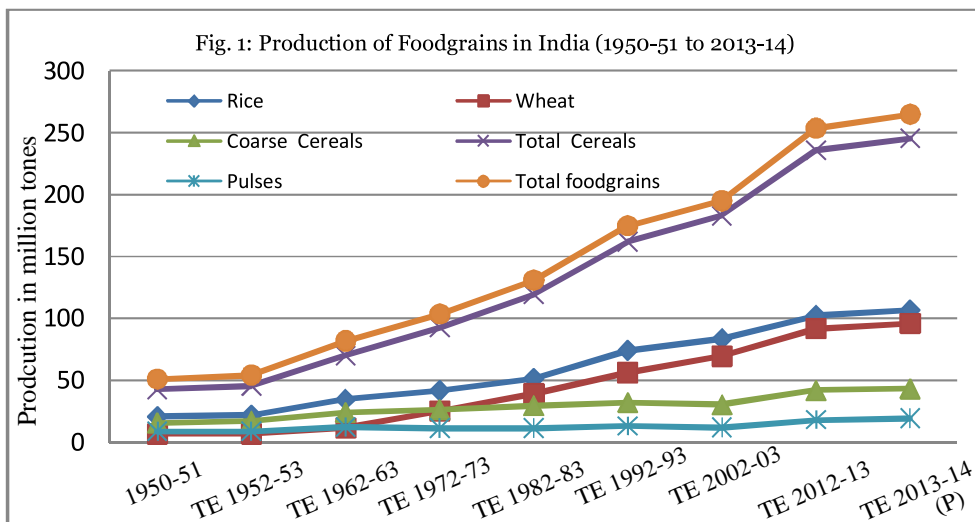
India plays a very important role by its contribution in world food production. It accounts for 10.6 per cent of total world's total cereals production (rank third next to China and USA) and 25.5 per cent of world's total pulses production (rank first) in 2011 (GOI, 2013). India's size in terms of food consumers is also many times larger than the average size of the rest of the countries, except China (Acharya, 2007), and accounts for 16.7 per cent of the world's food consumers. Another important dimension of food security in India is that a large number of rural households in India are food grain producers, a fact which has got positive implications for food access (Kalamkar, 2011). Food and nutrition security has remained one of the top priorities of policy planners in post-independence India. Improving the food security is an issue of considerable importance for the developing countries like India where millions of people suffer from hunger and malnutrition. Due to deep-rooted poverty, rapidly growing population, low agricultural productivity and resultant food and nutritional insecurity during early independence periods, country had to give high priority to make our population food secure which would in turn mean economic growth and reduce poverty.




India made significant advances towards achieving its goals of rapid agricultural growth, improving food security, and reducing rural poverty during last four decades. The introduction of Borlaug new seed-fertilizer technology during the mid sixties led to large increases in the yield levels of wheat, rice and later oilseeds and cotton (Bhalla, 2007). Food grains production has increased more than five times from 50.82 million tonnes (mt) in 1950-51 to about 264.77 mt in 2013-14 (GOI, 2015) (see, Fig. 1). The increase in the foodgrains production was mainly resulted from yield gains rather than expansion of cultivated area under food grains, which remain stagnant at around 125 million hectares since last four decades (since 1973-74). The country has followed a multi-pronged strategy to improve and sustain food and nutrition security. The strategy includes (i) strong support for raising food production, (ii) stable supply of some food staples and (iii) making food available at affordable prices. This strategy embraces several instruments that cover generation and adoption of technology, better availability of inputs, institutional credit, subsidy on farm inputs, improved infrastructure, expansion of irrigation, institutional reforms and mechanism, competitive markets, remunerative prices for farmers/producers, public procurement, system of buffer stocks, open market sales, supply of food through public distribution system, nutrition interventions and trade policy (Chand and Jumrani, 2013).

However, despite the impressive growth and development, India is still home to the largest number of poor people of the world and accounts for about one-fifth of the world' poor (20.6% share of world's poorest in 2013). Food availability and price stability, which are considered as a good measure of food security till 1970, were achieved through green revolution and Public Distribution System (PDS), however the chronic food security which is primary associated with poverty, still persisted in the country. In addition to this, per capita per day availability of food grains in India is almost stagnant during last decade. Though physical access to food was achieved, economic access at micro-level lagged behind indicating food and nutritional insecurity. The FAO report 'The State of Food Insecurity in the World 2014' estimated that India is home to more than 190.7 million undernourished people (2012-14), which is 15.2 per cent of the national population (FAO, IFAD and WFP, 2014). India is home to the greatest population of severely malnourished children in

the world. Accordingly, to the National Family Health Survey of India, 55 per cent children living in rural areas suffer from malnutrition compared to 45 per cent of children in urban areas. Rural poverty and food insecurity at household level remain pronounced, despite pervasive government interventions. Therefore, issue of ensuring food and nutritional security for the masses has occupied a central place in recent policy debates in India (Kalamkar, 2011a).



The experience of last three decades (1981 to 2010) indicate that the growth rate of food grain production decreased from 2.7 per cent per annum during the period 1986-97 to 0.9 per cent per annum during 1996-2008 (Kalamkar, 2011a). The yield growth rate of food grains also decreased from 3.1 per cent to 1.0 per cent during the same time period. The decadal growth indicates that foodgrains production rate declined from 2.7 in 1980s to 2.1 per cent during 1990s to 1.9 per cent in 2000s. The productivity rate of growth during corresponding period was 2.9, 2.1 and 1.6 per cent respectively. Whereas growth in area under foodgrains declined at the rate of 0.2 per cent during 1980s and 0.1 per cent during 1990s, while same had increased marginally during 2000s at the rate of 0.3 per cent per annum. Thus, declining growth of food grains production was partly contributed by the decline in area but largely by the decline in rate of yield. There was also decline in growth in the production of other agricultural commodities. This is clearly reflected in the decelerated agriculture growth from 3.5 per cent during 1981-82 to 1996-




97 to around 2 per cent during 1997-98 to 2004-05. Nevertheless, there have been signs of improvement during the recent years (Dev and Sharma, 2010; Kumar, 2013 and GOI, 2013). The significant and reverse turn in agricultural production occurred mainly due to the implementation of important programmes, such as Rashtriya Krishi Vikas Yojana (RKVY), National Food Security Mission (NFSM), National Horticultural Mission (NHM), various sub-schemes and substantial increase in the state agricultural outlay on agriculture (GOI 2013; Kumar, 2013).

The structural change initiated by the reform process in the early 1990s completely transformed the Indian economy. This is evident from the remarkable increase in annual Gross Domestic Product growth rate from 5.3 per cent in 1990-91 to 8.9 per cent achieved during 2010-11, which latter lower down to 4.7 per cent in 2013-14. The process of reforms transformed the services sector much more than that of manufacturing and agriculture sector. As per the estimates of Department of Economics and Statistics 2014, services sector's contribution in the GDP increased from 49.60 per cent in 1990-91 to 59.90 per cent in 2013-14, as against drastic decline from 24.90 per cent to 13.9 per cent by the agriculture sector during the same time period, even share of manufacturing sector had remained around 26.1 per cent during 2013-14. The above statistics clearly indicates the transformation of the Indian economy from traditional agrarian to service oriented Indian economy. In the midst of this transformation from agriculture to services, it is very interesting to highlight the revelation by the National Sample Survey (NSS) 66th Round (GOI, 2013) that still, more than half of the Indian rural workforce continues to opt agriculture for their livelihood. 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.

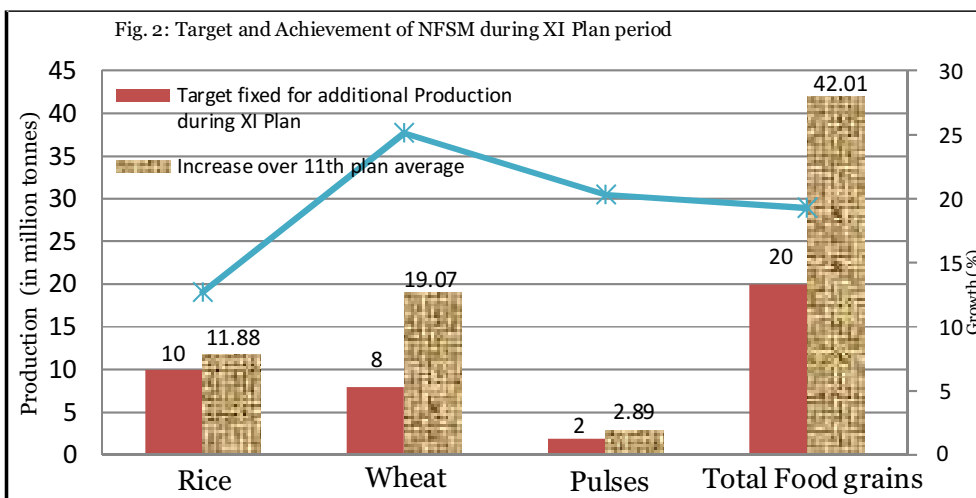
Launching of National Food Security Mission

In order to combat the challenge of deficit food availability in the country, the Government of India launched National Food Security Mission



(NFSM) in 2007-08 at the beginning of 11th Five Year Plan. The NFSM Programme targeted to escalate/rise production of rice, wheat and pulses by 10, 8, and 2 million tonnes, respectively by the end of Eleventh Five Year Plan. The mission had adopted two-fold strategy to bridge the demand-supply gap. First strategy was to expand area and the second was to bridge the productivity gap between potential and existing yield of food crops. Expansion of area approach was mainly confined to pulses and wheat only and rice was mainly targeted for productivity enhancement. The chief measures adopted to augment the productivity included: (1) acceleration of quality seed production; (2) emphasizing Integrated Nutrient Management and Integrated Pest Management; (3) promotion of new production technologies; (4) supply of adequate and timely inputs; (5) popularizing improved farm implements; (6) restoring soil fertility; and (7) introduction of pilot projects like community generator and blue bull. A total amount of Rs 4500 crores have been spent under NFSM during the 11th FYP (GOI, 2014).

As stated above, NFSM aimed to escalate production of rice, wheat and pulses. Generating employment opportunities was also a key objective. The NFSM target was to enhance farm profitability so that the farming community retains its confidence in farming activity. With these strategy and goals, NFSM was implemented in 561 districts in 27 states in the country (GOI 2013). Along with the NFSM, Rashtriya Krishi Vikas Yojana (RKVY) programme was also launched during the same time period. In addition, there were several other state and Centrally Sponsored Programmes running parallel with the NFSM programme. Aided by all the above efforts of the Central and State governments, rice production during the end of 11th Five Year Plan increased by 11.88 mt, wheat production by 19.07 mt and pulses production by 2.89 mt as compared to the production during the year 2006-07 (see, Fig. 2).



The main feature of NFSM has been the promotion of proven agriculture technologies to the farmers in relatively less productive districts. Several technologies and agriculture practices, including improved seeds, planting techniques, resource conservation tools and technologies, nutrient and soil management, etc. have been delivered through the Mission during the last six years. Timely availability of critical inputs was accomplished through various interventions under the mission for which the response of farmers has been very enthusiastic². After achieving the goal of increasing foodgrains production by 20 million tonnes during XIth Plan period under NFSM, new targets have been set to produce additional 25 million tonnes of foodgrains by 2016-17: 10 million tonnes of rice, 8 million tonnes of wheat, 4 million tonnes of pulses, and 3 million tonnes of coarse cereals. The main focus is on cropping systems and on small and marginal farmers through development of farmer producer organizations (FPOs) and creating value chain and providing market linkages (GOI, 2014).

²Forward by Secretary, Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India to report by Sandhu, et al., (2014).


Background of NFSM in Gujarat

The NFSM is in operation in 27 states of the country including Gujarat. NFSM-Rice, NFSM-Wheat, NFSM-Pulses and NFSM-Coarse Cereals are being implemented in the state. During first two years of XIIth five year plan period, no district in the state was covered under NFSM-Coarse Cereals programme (see, Table 1). It was included in the year plan of 2014-15. During the year 2014-15, out of 33 districts in the state, total 26 districts of the state were covered under NFSM. Out of 26 districts covered under NFSM, all districts were covered for NFSM-Pulses, 02 districts were covered for NFSM-Rice, 05 districts were covered for NFSM-Wheat and 08 districts were covered for NFSM-Coarse Cereals during the year 2014-15.

Table 1: Yearwise districts covered under NFSM in Gujarat

Year	No. of districts in State	District covered under NFSM			
		Wheat	Paddy	Pulses	Coarse Cereals
2007-08	26	04	02	11	-
2008-09	26	04	02	11	-
2009-10	26	03	02	11	-
2010-11	26	04	02	26	-
2011-12	26	04	02	26	-
2012-13	26	04	02	26	-
2013-14 (since 13.08.2013)	33	05	02	26	-
2014-15	33	05	02	26	08

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. Therefore, this study was undertaken with following specific objectives.




Objectives of the Study

- a) To analyse the trends in area, production, productivity of rice, wheat and pulses in the selected NFSM districts in Gujarat;
- b) To analyse the socio-economic profile of NFSM beneficiary vis-a-vis NFSM- Non beneficiary farmers in Gujarat;
- c) To assess the impact of NFSM on input use, production, income and employment among the beneficiary farmers in Gujarat;
- d) To identify factors influencing the adoption of major interventions (improved technologies) under NFSM in Gujarat; and
- e) To identify the constraints hindering the performance of the programme in Gujarat.


II. Data and Methodology

The study is based on both secondary as well as primary level data. The secondary data on area, production and productivity of crops and related parameters were collected from various publications of Ministry of Agriculture, Government of India and as well as office of the Director of Agriculture, Government of Gujarat, Gandhinagar, related websites, research reports, papers, presentations. The primary survey data were obtained from selected sample farmers from two NFSM-Wheat districts of the State. For the selection of farmers, a multi-stage sampling design was employed. At the first stage, two NFSM-wheat districts were selected. For the selection of district, crop production triennium average (TE) in the NFSM districts for the last three years period for which latest data were available was arranged in descending order. Out of the districts which were included in NFSM Wheat during last three year, top crop production NFSM-Wheat district and bottom crop production NFSM-Wheat district was selected for the survey for each crop. Accordingly, Ahmedabad and Banaskantha districts were selected for primary data collection.



From each district, two talukas were selected at the second stage, drawing one taluka from the nearby district headquarter and the second at a distance of 15-20 kilometers from the district headquarter. Accordingly Dholka and Sanand taluka from Ahmedabad; Palanpur and Kankrej taluka from Banaskantha district were selected. Subsequently, at the third stage, 75 beneficiaries and 25 non-beneficiaries were selected randomly from each taluka making a total sample size of 200 households per district and 400 households for wheat crop in the state of Gujarat. For the selection of beneficiary households in each taluka, the beneficiary list was obtained from the Department of Agriculture/State Officials at the taluka level. After obtaining the beneficiary list, the households were selected in such a way that major component/s covered under the scheme get due representation. For the selection of non-beneficiary households, there was no list available. Therefore, the selection of non beneficiary households was done from same peripheral areas so that similar cropping pattern and baseline characteristics are represented by the non-beneficiary households as well. Giving representation to different size classes and various socio-economic characteristics was also tried while selecting the beneficiary and non beneficiary sample farmers.

In order to fulfill the first objective of analyzing the trends in production, productivity of rice, wheat and pulses in NFSM districts and Non-NFSM districts, secondary data on area, production and productivity of rice, wheat and pulses for 9th, 10th and 11th FYP is used. Average annual growth rate, correlation and graphical analysis were applied using this secondary information. For meeting the remaining objectives, primary household data were used. The primary data relating to general information about the sample farmers, socio-economic profiles, cropping pattern, details on various inputs used in paddy, wheat and pulses cultivation, irrigation details, yield, returns, reasons for adoption/non-adoption of NFSM interventions, constraints faced for availing the benefits, suggestions for improvement, etc., were collected from the sample beneficiary and non-beneficiary farmers using a pre-tested questionnaire. The primary household data was collected mainly pertaining to the agricultural year 2013-14 which is the latest agricultural year.




The year to year change in irrigated area, fertiliser use as well as growth in area, production and productivity of crops covered under NFSM during plan period was estimated as: Year to Year Change (YYC) = $(CYV - PYV) / PYV * 100$; Where, CYV- Current year value; PYV –Previous year value. The data of the last year of previous plan was used for estimation of year to year change for the first year of the plan. The planwise average annual growth rate (AAGR) was estimated by taking average of year to year change, as: AAGR (average of year to year to change) = Average of YYC. The relation between per cent change in NFSM expenditure and per cent change in fertilizer consumption, irrigated area, area and production of paddy, wheat and pulses was analyzed by estimating Correlation Coefficient between two data sets.

In order to know the factors impacting the participation of farmers in NFSM, logit regression model using generalized liner model was used. The binary dependent variable was used as: 1 for NFSM beneficiaries; 0 for Non-beneficiary. The determinants/ independent variables considered/used for analysis were age (years), education (code), total farming income (Rs/annum), caste (code), number of people engaged in farming/agriculture, net irrigated area (acre), asset value (Rs), and credit amount borrowed (Rs./acre).

III. Findings from Secondary Data


Impact of NFSM on Foodgrains Production in the State

- The state has 188.1 lakh hectares of total reporting area. The net sown area accounted for 54.8 per cent of reporting area. The trend in area and fertiliser use in Gujarat during 1997-98 to 2011-12 indicate that during the last three plan periods (9th to 11th plan period), net area sown has grown from 97.3 lakh hectares (1997-98) to 103 lakh hectares (2009-10). Comparatively, the gross cropped area in the state has fluctuated a lot during corresponding period. It has increased from 112.1 lakh hectares in 1997-98 to 122.5 lakh hectares in 2010-11. Out of 103.2 lakh hectares of net sown area, 42.33 lakh hectares area was irrigated in 2010-11. So, 41.1 per cent of net sown area in the state was irrigated. The groundwater was the main source of irrigation



for more than 78 per cent of net irrigated area. The percentage of gross irrigated area to gross cropped area in the state was estimated to be 45.27 per cent. The cropping intensity in the state has increased marginally during last three plan periods while irrigation intensity has increased significantly.

- Plan-wise growth analysis shows that during 9th Five Year Plan period (FYP), average annual growth rate of net irrigated area, gross irrigated and cropped area had declined. The same trend was recorded positive in case of fertilizer use. During 10th FYP period, the positive rate of growth in net sown area with significant growth in area sown more than once has increased gross cropped area in the state. The significant increase in net irrigated area as well as area irrigated more than once has increased gross irrigated area significantly (by 8.214 % per year). The rate of growth in irrigation intensity as well as in cropping intensity was also very high. The total consumption of fertilizer as well as per hectare NSA fertiliser use had also increased tremendously (by 9.4 and 9.9 % per annum respectively) during this period. During 11th FYP period, the rate of growth achieved during earlier plan period could not to be sustained by the state and decline trend in rate of growth of net irrigated area as well as cropping intensity was noticed. Due to marginal decline in area under irrigation has impacted area sown more than once as well as area irrigated more than once, which ultimately reduced cropped as well as irrigated area and thus cropping as well as irrigation intensity. However, fertilizer consumption has recorded significant increase during the plan period.
- During 9th FYP plan period, the overall consumption of NPK had declined from 10.27 lakh tones in 1997-98 to 9.15 lakh tones in 2001-02, then significantly increased to 14.1 lakh tones in 2007-08, further reported to increase to 17.3 lakh tones in 2011-12. The NPK consumption per hectare of NSA has also increased from 105.6 kg in 1997-98 to 175 kg in 2011-12. It is worth mentioning here is that despite of State Government flagship programme on ‘Soil Health Card’ (which supposed to make aware the farmers about the negative consequences of application of overdoses of fertiliser and positive effects of balanced fertiliser application on soil

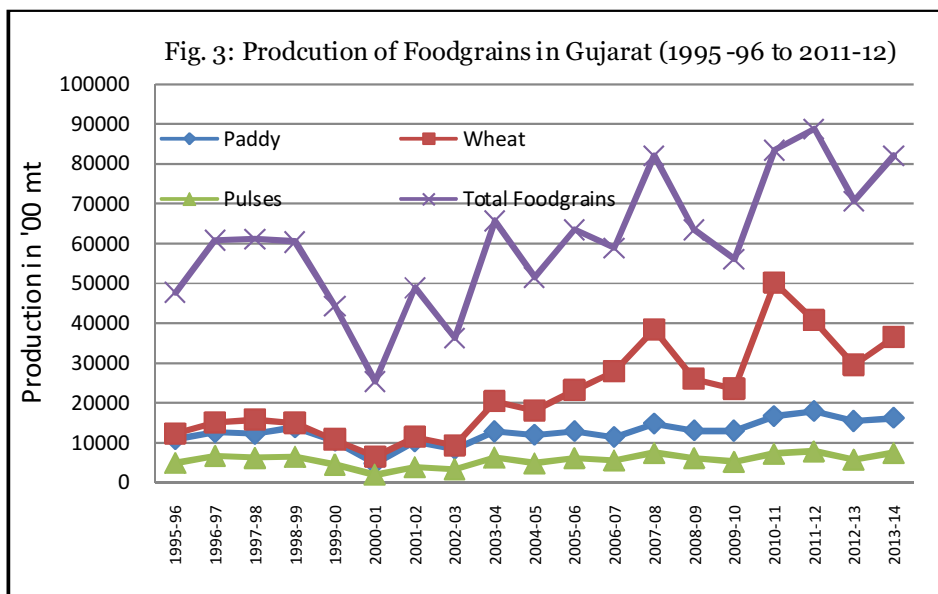


health), the fertiliser consumption in the state has registered increasing trend.


Growth of Paddy, Wheat & Pulse Crops–Impact of NFSM (State)

- Gujarat is one of the important producers of food grains in the country, which contributed around 3.10 per cent to national foodgrains production in 2013-14. However, high year to year fluctuations in production of foodgrains is major concern (see, Fig. 3). During the year 2013-14, foodgrains crops were grown on 4.29 mha having production of 8.21 mt with average productivity level of 1917 kg/ha. The average productivity level of foodgrains in the state was lower than national average (2101kg/ha), despite the fact that about 46.0 per cent area under foodgrains in the state was irrigated during 2011-12 (close to national average of 49.8 %). In fact level of productivity of foodgrains in the state was less than half of productivity level recorded in Punjab (4409 kg/ha) in 2013-14. As like at all India level, the state has also registered significant growth in foodgrains production in recent past (Fig. 3).
- **Wheat:** Wheat is the important rabi crop grown in Gujarat, occupies around 12 per cent gross cropped area. This crop is mostly grown as irrigated crop (98 % in 2010—11), except wheat production in Khambhat, where it generally grown as rainfed crop. As per GOI (2015) estimates, wheat crop was grown on 1.35 million ha area in Gujarat with production of 3.65 million tonnes, accounted for 4.33 per cent area and 3.81 per cent production of the country in 2013-14. Per ha productivity of wheat in the state (2703 kg/ha) was lower than national average of 3075 kg/ha in 2013-14. The trend in area, production and productivity of wheat during last three plan periods shows that during 9th plan period, area under wheat had declined at the annual average rate of growth of 0.06 per cent per annum, whereas productivity growth was positive. The tremendous growth in production was recorded in 10th FYP period mainly due to significant increase in area under wheat crop (19.83 % per annum) supported by positive growth in productivity of this crop. Though during the last FYP

period, rate of growth in production was lower down as compared to earlier plan period, expansion in area under wheat as well as increase in productivity level, production had increased at the rate of 18.03 per cent per annum.




- Paddy:** In the state of Gujarat, paddy occupies around 6 per cent of the gross cropped area of the State in 2011-12. As per GOI (2015) estimates, during 2013-14, paddy crop was grown in Gujarat on 0.79 million ha area with production of 1.62 million tonnes. About 62 per cent of area under paddy in the state was under irrigation during 2011-12. The state of Gujarat had accounted for 1.79 per cent of area and 1.52 per cent of production of paddy of the country (2013-14). The productivity level of rice in the state was 2053 kg/ha which was lower than all India average of 2424 kg/ha during 2013-14. As seen in case of wheat crop, during 9th FYP period, the rate of growth in area under paddy was also found negative, while tremendous growth in productivity level was estimated (7.05 % per annum). During 10th FYP period, significant increase in productivity level (3.22 % per annum) as well as increase in area under paddy (08.37 % per annum) has resulted in significant growth in production (4.737 %). The positive high rate of growth



in area and productivity equally contributed in significant increase in production of paddy in the state (10.61 % per annum) during 11th FYP period.

- **Pulses:** About 7 per cent gross cropped area of the State was under pulse crops during 2010-11. As per GOI (2015) estimates, state accounts for 3.22 per cent of country's total pulses production in 2013-14. Tur and gram are the important pulse crops grown in State. Tur is the main pulse crop grown in Gujarat. It accounted for about 2.2 per cent of gross cropped area and about 4 per cent of total food grains production in the state. It was grown on about 0.21 mha area with production of 0.24 mt, which accounted for 5.41 per cent and 7.26 per cent in total area and production of the country in 2013-14. The productivity level of tur in the state was 1138 kg/ha as compared to national average of 849 kg/ha). The top five major tur growing districts in the state are Vadodara, Bharuch, Surat, Panchmahal and Sabarkantha. Gram crop was grown on 0.25 mha area having production of 0.28 mt with average productivity level of 1150 kg/ha, which was significantly higher than national average of 967 kg/ha in 2013-14. As like in paddy and wheat crops, area under pulses recorded negative trend during 9th FYP period, while productivity growth was positive which increased the production at the rate of 1.81 per cent per annum during this period. The significant increase in productivity level (8.84 % per annum) followed by area increase (3.24 % per annum) during 10th FYP period has recorded heavy increase in production of pulses in the state (14.17 % per annum). During 11th FYP period, production of pulses had increased at the rate of 9.74 per cent per annum due to significant increase in productivity level (4.97 % per annum) followed by increase in area (3.52 % per annum).

Thus, state has experienced increase in production of wheat which was mainly due to significant increase in area under crop followed by increase in productivity, whereas in case of paddy and pulses, productivity growth was main factor followed by growth in area under these crops. It is worth mentioning here is that during the year 2007-08 to 2009-10, 11 districts of the State were covered under NFSM. However, during 2010-11 and 2011-



12, all 26 districts of the State were covered. During the year 2014-15, out of 33 districts in the state, total 26 districts of the state were covered under NFSM. Out of 26 districts covered under NFSM, all districts were covered for NFSM-Pulses, 02 districts were covered for NFSM-Rice, 05 districts were covered for NFSM-Wheat and 08 districts were covered for NFSM-Coarse Cereal crops.

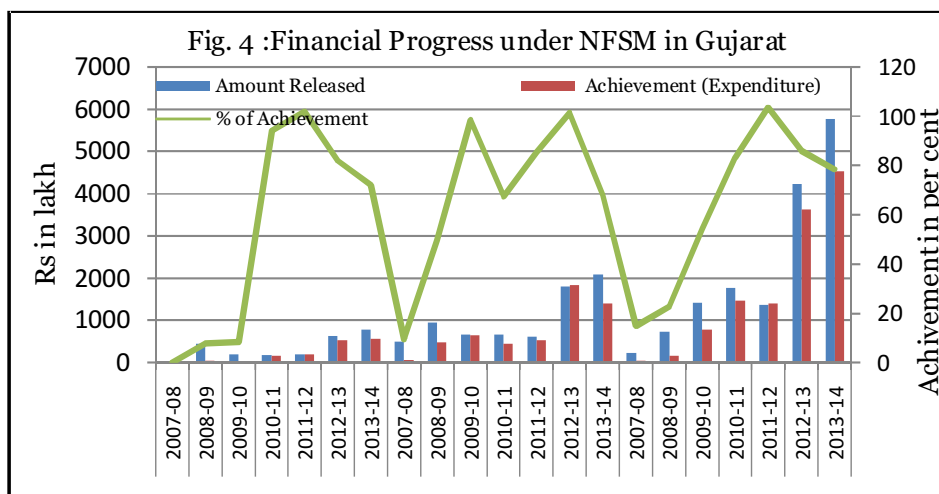
District-wise Growth of Paddy, Wheat & Pulse crops and Impact of NFSM

- The districtwise growth in area, production and yield of wheat in NFSM and Non-NFSM districts in Gujarat shows that during 11th FYP period, among NFSM districts, Ahmedabad district recorded highest rate of growth in production (29.32 %) followed by Banaskantha (16.65 %) and Sabarkantha (14.18 %) and the lowest growth rate in production was recorded in Mehsana (11.19 %). Area and productivity growth rate was highest in Ahmedabad, followed by Banaskantha. Among non-NFSM districts, Porbandar district has recorded the highest rate of growth in production, mainly due to increase in area under this crop. The lowest growth rate in production was recorded in Jamnagar district where productivity growth was found better than growth in area.
- In case of paddy, during 11th FYP period, out of two NFSM-Rice districts, the rate of growth in production was positive and significantly high in Dahod district, mainly due significant growth productivity whereas area under crop was declined. The rate of growth in production of paddy in Panchmahal was also very high (29.73 % per annum), mainly due to productivity growth. Among Non-NFSM districts, Navsari and Ahmedabad recorded more than 16 per cent increase in production during 11th FYP period.
- In case of pulses, among all NFSM districts covered during the last plan period, Banaskantha recorded highest rate of growth in pulses production (44.95 %), whereas lowest growth in production was recorded in

Sabarkantha (2.31 %) while same was recorded negative in Surat, Valsad and Kheda districts. Due to drastic decline in both area and productivity of pulses, production of pulses in Surat had declined drastically. Production decline in Valsad was due to decline in productivity level while same was due to decline in area under pulses in Kheda district. Thus, efforts should be made to arrest decline in area under pulses in these districts as well as attempt should be made to enhance the productivity level.

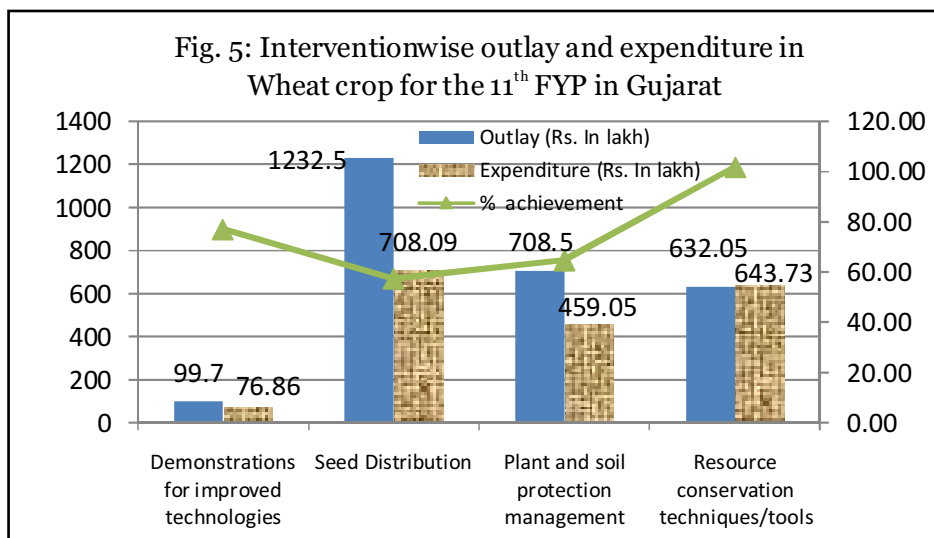
Financial Progress under NFSM in the 11th & 12th FYP

- The financial progress under NFSM in Gujarat indicate that during the year 2011-12, total expenditure under NFSM rice and pulses was more than amount allocated whereas in case of wheat, it was about 85 per cent (Fig.4).




- The districtwise percentage share of expenditure in total outlay during five years period indicated that the districts which had spend the allocated amount more than or close to budgeted amount and crossed or almost achieved the target were Surendranagar, Rajkot, Junagadh, Jamnagar, Narmada, Kutch, Porbandar, Ahmedabad, Tapi, Kheda, Surat, Gandhinagar, Anand, Patan, Mahesana and Vadodara. The share of expenditure in total outlay was recorded to be the lowest in Dang district, which is one among the tribal and backward districts of the state.

- The details on category wise intervention wise outlay and expenditure in wheat, rice and pulse crops for the 11th FYP in Gujarat (2007-08 to 2011-12) shows that in case of wheat crop, achievement rate was better in resource conservation techniques/tools category (e.g. incentive on Rotavators, Seed Drills, Sprinkler Sets, Knap Sack Sprayers as well as for Pump sets) followed by plant and soil protection management category in which incentive for Gypsum (for Salt affected soils) was given (Fig. 5). In demonstrations for improved technologies, achievement rate was better in demonstrations on improved package of practices activity. It was very disturbing to note here is that expenditure on increase in SRR activity was short by about 42 per cent. Unless rate of seed replacement is increased, the productivity level of crop would remain lower in many areas of the state.




- In case of rice crop, the target was achieved only in one intervention under resource conservation techniques/tools, i.e. incentive for pump sets. The other interventions in which expenditure ratio to outlay was more than 60 per cent were incentive for cono-weeders & other implement, incentive on knap sack sprayers, incentive on rotarator and incentive on seed drills. Under the category of plant and soil protection management, about 80.73 per cent expenditure of total outlay was spent on providing assistance for plant protection Chemicals and bio-agents.

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- In case of pulse crops, the expenditure was more than the outlay for the interventions such as incentive for diesel pump sets, distribution of rotavators, production of certified seeds and organization of technology demonstrations. The other major interventions were incentive for knap sack sprayers and distribution of seed drills.

IV. Findings from Field Survey Data

Household Characteristics, Cropping Pattern & Production

- The socio-economic profile of the selected households indicate that selected NFSM beneficiary households were relatively large in size, more dependence on agriculture with 1.37 times higher average size of holdings than selected Non NFSM households (Table 2). The average family size of beneficiary households was 7.25 whereas same was 6.57 in case of non beneficiary households. The average size of land holding with beneficiary and non beneficiary households was 8.05 acre and 5.86 acre respectively. Both categories households were dominated by male respondents thus decisions were mostly taken by male as a head of household. It was strange to note here that only about 44 per cent members of beneficiary households and about 35 per cent members of non-beneficiary households were engaged in agriculture despite of the fact the major source of income for both categories of households was agriculture. About a quarter of family members were aged below the 15 years with one fifth illiterate family members in both groups. The social classification of selected households indicate that other backward classes accounted the highest share (around 50%) in total selected households followed by general category (around 40%) and the lowest share was of SC category households (less than 10 %).
- The distribution of net operated area as per land holding size category indicate that among the beneficiary group, small farmers accounted for 32 per cent of total holders with about 15 per cent of total net operated land area, followed by medium farmers (30 per cent holders with 27.77 per cent of total net operated land area), large farmers (21 % holders with 53.16 % of



net operated land area) and the lowest number of holders and area was recorded in case of marginal farmers group (17 % of holder accounted for 3.77 % of area). In case of non-beneficiary households, except higher share of land holders in marginal group than large group, same trend was noticed. Thus, total 49 per cent beneficiary holders which were marginal and small farmers put together had hardly hold 19 per cent area of total land holdings, whereas in case of non-beneficiary households, total 60 per cent small and marginal holders put together had hold about 28 per cent share in total land holding area. The average net operated land holding size was higher in beneficiary households (8.05 acre) than its counterpart (5.86 acre).


- The characteristics of operational holdings of selected households show that beneficiary households had possessed/owned 7.15 acre whereas non-beneficiary household had 5.4 acre land. The land leased in pattern seems to be dominant in selected beneficiary household than non-beneficiary household. Though, in absolute term, area sown more than once was also higher in beneficiary household (4.61 acre) than non beneficiary household (3.61 acre), the relative share of same to net sown area was higher in non-beneficiary household (61.5 %) than beneficiary household (57.3%) resulted in higher cropping intensity in non beneficiary household than beneficiary household. The same trend was observed in terms of area irrigated more than once, resulted in higher irrigation intensity in non-beneficiary household (166.04 %) than beneficiary household (160.43%).
- The details on sources of irrigation show that 92 per cent land of beneficiary households and about 95 per cent land of non beneficiary households was irrigated. Among the sources of irrigation, groundwater was the main source of irrigation to both the groups. The tubewell source of irrigation accounted for about 50 per cent area under irrigation in case of beneficiary households, whereas it was about 75 per cent in case of non-beneficiary households. The canal irrigation was another source of irrigation which accounted for around 20 per cent irrigated area in both cases. The share of tank irrigation in total net irrigated area of beneficiary households was significantly higher (16.1%) than non beneficiary households (1.51 %). Thus, the selected households in both groups were well protected with the supportive irrigation in crop production.


- The tenancy details indicated that about 54 per cent of leased-in was taken by beneficiary households on fixed rent on cash basis, followed by share cropping (27.47 %) and fixed rent in cash (18.82 %). The pattern of fixed rent in cash was followed by beneficiary household in leasing out the land. In case of non-beneficiary households, fixed rent in kind pattern in leased-in land accounted for highest share in total land leased-in (41.97 %), followed by share cropping (33.68 %) and fixed rent in cash pattern (24.34%). The rate of taking land on leased-in was found higher than the rate for leased-out in selected area. Of course, quality land may differ which must have effected on deciding this land rate.

Table 2: Socio-Economic Profile of the Sample HH (% of HH)

Sr. No.	Particulars		Selected HH		
			NFSM	Non-NFSM	
1	Total households surveyed: numbers		300	100	
2	Household size: Average Size: numbers		7.25	6.57	
3	% of HH members engaged in farming		43.51	34.40	
4	Gender of the Respondent (%)	Male	97.33	99.00	
		Female	2.67	1.00	
5	Age group of the members (%)	Adult Males (>15 yrs)	37.76	38.05	
		Adult Females (>15 yrs)	35.60	36.68	
		Children (<15 yrs)	26.63	25.27	
6	Education status of the family members (%)	Illiterate	22.33	19.00	
		Primary	27.90	30.86	
		Middle	27.90	24.69	
		Matriculation/secondary	25.32	22.22	
		Higher secondary	9.87	7.41	
		Degree/Diploma	5.58	8.64	
		Above Degree	3.43	6.17	
7	Caste of households (%)	SC	9.33	6.00	
		ST	0.00	0.00	
		OBC	49.00	56.00	
		General	41.67	38.00	
8	Occupation income (Rs./annum/HH)	Only agriculture (net)	268526	184707	
		Dairy business	55020	49225	
		Salaried/pensioners	14573	19280	
		Wage earners	100	2380	
		Own Non-farm business	2673	4510	
9	Net operated area	% of area	Marginal (0.1 to 2.5 ac)	3.77	7.67
			Small (2.51 to 5 ac)	15.29	20.17
			Medium (5.1 to 10 ac)	27.77	32.25
			Large (10.1 and above)	53.16	39.92
		% of holders	Marginal (0.1 to 2.5 ac)	17.00	27.00
			Small (2.51 to 5 ac)	32.00	33.00
			Medium (5.1 to 10 ac)	30.00	25.00
			Large (10.1 and above)	21.00	15.00
		Av. size	Total (acres)	8.05	5.86


Source : Field Survey Data.

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- The cropping pattern of the selected households indicated that cereals crops accounted for 67.40 per cent GCA of beneficiary households, whereas it was 55.67 per cent in non-beneficiary households. The area share of total pulses was very meager in cropping pattern, accounting for 0.79 per cent and 0.13 per cent area of GCA of beneficiary and non-beneficiary households respectively. Thus, total foodgrains crops area share in GCA was higher in case of beneficiary (67.40 %) than non-beneficiary households (55.79%). In case of oilseeds, non beneficiary households had allocated more land to oilseed crops than its counterpart. The paddy and wheat were the main cereal crops grown by selected households followed by bajra and jowar. Gram and moog were major pulse crops grown. Castor and rapeseed mustard accounted significant share in area under oilseeds of selected households. Cotton accounted for about 10-12 share in cropped area of selected farmer households. Guar and Cumin were other crops grown by the selected households during the year under report.
 - The details on household income earned from agricultural and non agricultural sources of selected households shows that net return per household as well as per acre of NSA under crop cultivation was marginally higher in case of beneficiary household than non-beneficiary household, which was estimated to be Rs. 268526/hh and Rs. 33370/acre of NSA in beneficiary, while Rs. 184707/hh and Rs. 31513/acre of NSA for non-beneficiary household. However, per household non-farm income was higher in non beneficiary household, may be due to low share of family members in agriculture and thus dependence on non-farm activities. In all, total income was recorded higher in beneficiary household.
 - The crop-wise per acre costs and returns among the sample households shows that the average level of productivity of all cereal crops was found higher in beneficiary farmer households than non beneficiary farmer households. Particularly in case of wheat crop, average yield realized by beneficiary farmer households was 14.94 qtls/acre whereas same was 14.86 qtls per acre in case of non-beneficiary farmer households. Except jowar and barley, net returns realized by beneficiary households in all other cereal crops were higher than non-beneficiary group. In case of wheat crop



cultivation, net returns per acre realized by beneficiary household was Rs. 13770/-, whereas it was Rs. 10237/- per acre in case of non-beneficiary households. Despite of high productivity level in barley and almost same productivity in jowar crop, low cost of crop cultivation of these crops by non beneficiary households had fetched them high profit level than beneficiary household.

- In case of pulses, moog crop was grown by both groups wherein rate of yield as well as net returns was higher in case of non-beneficiary households. In case of oilseed crops also, except groundnut crop, in all other oilseed crops, beneficiary households had realized higher returns than non beneficiary households. Cotton is an important cash crop grown by the selected farmer. It was observed that the average level of productivity as well as net returns per acre cost of cultivation in cotton was slightly higher in non-beneficiary households than beneficiary households. Almost Rs. 34,000/- per acre profit was realized by both the groups in cultivation of cotton crop.
- The details on farm assets holding by sample households show that the availability of farm implements, machineries and equipments were relatively better with beneficiary households than non-beneficiary households. The average availability of land development, tillage and seed bed preparation equipments as well as sowing and planting equipments were two times higher with beneficiary household than non-beneficiary households. The availability of tractor/mini tractor was relatively higher with beneficiary households and more half of the selected households had tractor as compared to every fifth household in non-beneficiary group. As it has been noted earlier that both selected group households were dependent on groundwater for irrigation purpose and therefore water lifting equipments such as pumpsets and water saving sprinkler irrigation systems were available with the selected households. Among the various sowing and planting equipments, only seed drill was available with selected farmers of both groups. The other important equipments available with selected households were sprayers, harvesters, levelers, and choppers. One among every two households in both groups had a cattle shed. Overall, both the groups of households possessed the necessary farm equipments and machineries for crop cultivation.

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- Availability of credit is important factor of crop production. Out of the total selected beneficiary households, 79 per cent households had taken loan, whereas in case of non-beneficiary, this proportion was 66 per cent. The major source of credit was Primary Agricultural Credit Societies followed closely by commercial banks. Only one beneficiary household has reported to be taken loan from informal source (i.e. money lender). Per household loan amount outstanding was found to be very high in both selected groups. It was very strange to note here that despite of the fact that both selected groups had realized the good harvest and returns, loan outstanding was relatively high in both groups. All the farmers had taken loan for productive purpose only that to for agriculture purpose. Around 3-4 per cent farmers from both groups had taken loan for the purchase of tractor.

NFSM Interventions and Its Impact on Farming

- About 96 per cent beneficiary households were aware about the NFSM and the purpose of benefit which they had received. More than 4 per cent farmers had availed the benefit without knowing the purpose as well as about NFSM.
- About 89 per cent of beneficiary households had received information on NFSM from agriculture department, followed by district level offices and through newspaper (3%). Thus, the agriculture extension was found active in selected areas.
- Total 316 benefit items were availed by the selected 300 beneficiary households, it means 16 sample households availed more than one benefit item (Table 3). The benefits item-wise distribution of selected beneficiary households indicate that the largest number of farmers (43 %) had availed the benefit of FLD kit (Seed, Fertilizers and Knap Sack Sprayers), followed by benefit of incentive for micro nutrients in deficit soils (33.67%), benefit of rotavators (10.67 %), benefit of incentive for lime in acid soils (5.33 %), benefit of pump sets (5.00 %), benefit of manual and power operated knap sack sprayers (4.33 %), benefit of seed drills (2.00%), benefits of machineries/tools -multi crop thresher (0.67) and land laser (0.67 %).


- If we consider the farmers who had benefited with large absolute subsidy amount, benefit of land laser, thresher, rotarator, seed drill and pumpset were major ones. In terms of percentage of subsidy to total cost availed by the beneficiary households, it was observed that highest subsidy benefit was availed by sample farmers in FLD kit (71.67 %), followed by incentive for lime acid soil (57.29 %) and incentive for micro nutrients in deficit soils (50.01%), whereas in remaining items, subsidy benefit ranges between 36-47 per cent. Thus larger number of farmers could avail the benefit of subsidy on FLD kit, may be due to low down payment/share amount as well as easy availability of kits at village level. The benefit of multi-crop thresher was taken by large farmers only, whereas same group farmers had availed benefits of half of the number of seed drill, rotavator and land laser instruments.

Table 3: Details on Benefit Availed by Selected Households

Sl. No	Benefit Item Name	No. of HHs availed benefits	No. of HHs benefitted to aggregate beneficiaries	Avg. total cost (Rs. per HH benefitted)	Subsidy as a % of total cost
1	Incentive for micro nutrients (in deficit soils- Multi Zinc)	101	33.67	1210	50.01
2	Incentive for lime in acid soils (Gypsum)	16	5.33	3370	57.59
3	Machineries/Tools (Multi crop Thresher)	2	0.67	53750	37.21
4	Seed drills	6	2.00	36333	41.28
5	Rotavators	32	10.67	78875	38.03
6	Pump sets (Diesel pump)	15	5.00	26513	37.72
7	Land Laser	2	0.67	350000	42.86
8	Knap Sack Sprayers (Manual and Power Operated)	13	4.33	4085	46.23
9	Others(FLD Kit- Seed, Fertilizers and Knap Sack Sprayers)	129	43.00	5913	71.67


Note : NA - Not Availed, More than one benefit availed, therefore total would more than 300/percentage exceed 100.
Source: Field Survey Data.

- FLD KIT and Knap Sack Sprayers as well as pumpsets were used by the sample households only on their own field and were not rented out. However, other implements were used on own farm by beneficiary as well as it were rented out. Land laser was used hardly 6 days on own field



whereas it was rented out for about 43 days which earned Rs. 42500/- in a year for beneficiary household. In case of rotarator, beneficiary households used it for 26 days on own field and then rented out for about 30 days, having total earning of Rs. 25170/- in a year. Multi-thresher was heavily used by the selected households on their own field as compared to seed drill (which used heavily for renting out). Thus selected farmer households had not only benefited with subsidy amount for particular item, he was benefited with its use on own farm as well as earned extra earnings by renting out the implement.

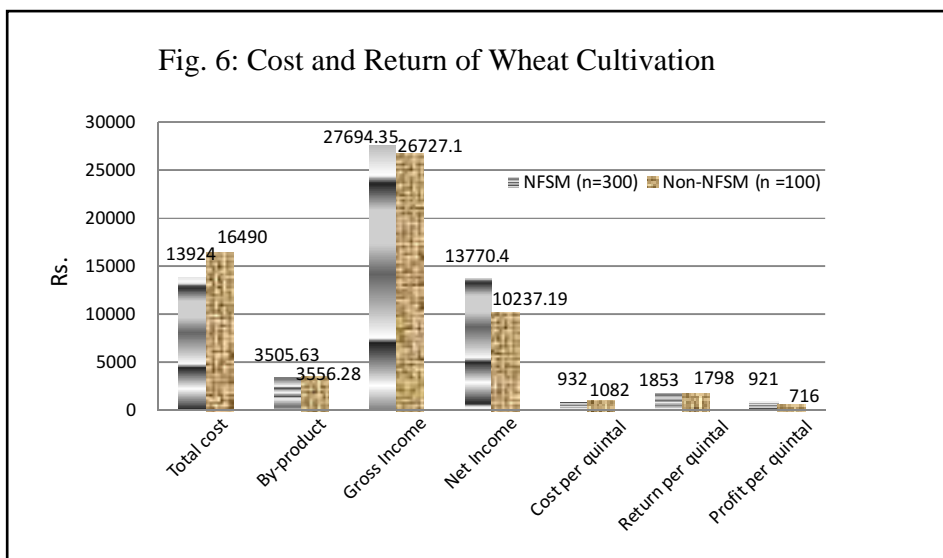
- More than 47 per cent beneficiary household opined that FLD KIT and Knap Sack Sprayers has helped in controlling weed, 34.51 per cent hh mentioned that it helped them in timely operations, about 23 per cent recorded that it has solved problem of labour shortage to some extent. It has also helped in reduction in cost of cultivation as well as good plant growth. Half of the selected farmers had opined that land laser has helped them solving labour problem, completion of operation in time, water saving, weed control, plant growth, reduced cost of cultivation as well as increased cropping intensity. Multi-thresher had benefited same ways.
- More than 73 per cent of households mentioned that pumpsets has helped them in completing operations in time, around 53 per cent farmers mentioned that it has solved labour problem whereas 40 per cent farmers noted that it helped in saving water. Seed drill was another important instrument benefit availed by selected farmers. About 66 per cent benefitted household opined that seed drill has helped in solving labour problem, 83 per cent farmers mentioned that they could do operations in time, whereas 50 per cent farmers recorded that seed drill use had reduced cost of cultivation as well as increased cropping intensity due to saving time in various operations. In solving labour shortage problem, completing operations in time and in controlling weed, rotavator was useful to selected beneficiary household.


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- The use of knap sack sprayers could impact less than 10 per cent (26.8% hh) towards increase in productivity, reduction in material cost (26.1% hh) and other aspects. Majority of farmers have mentioned that use of sprayer, as expected, had no impact on reduction in water use, improvement in soil health, very surprisingly no impact on improvement of human health.
 - In case of land laser, half of the beneficiary farmers opined that (except no impact on improvement in soil health and human health due to use of land laser), productivity level has increased significantly, material cost as well as water use was reduced (up to 30 %) and losses were reduced up to 10 per cent. Among the selected households, half of them mentioned that due to use of thresher, not only productivity level realized by farmer had increased by 20-30 per cent, same level impact was seen in case of fall in labour as well as material cost.
 - In case of use of pumpset, it was observed that about 20 per cent of beneficiary household mentioned that it has helped them in increasing the level of productivity of crop by 40-50 per cent, as well as helped in reduction in labour, water cost, reduction in crop losses, and helped in getting higher output prices due to better output.
 - More than 80 per cent of farmers have opined that use of rotarator has impacted as increased in crop yield by more than 10 per cent, 33.3 per cent mentioned the significant reduction in material, labour cost as well as reduction in losses. More than 50 per cent of farmer households had opined that seed drill use had reduced the labour cost, material cost and has helped in increasing the productivity level.

Per acre Cost and Return of Wheat (Rabi 2013-14)

- Wheat crop was grown during rabi season of agriculture year 2013-14. The beneficiary households had grown four varieties of wheat, viz. Bhaliya 313, GGW 496, Lok 1, and GGW 173. Out these four varieties, Bhaliya variety of wheat was grown mostly as rainfed wheat, whereas other wheat varieties

were grown with protective irrigation facilities. The results of per acre cost and returns of wheat crop grown during the year 2013-14 indicate that at overall level, total expenditure incurred towards per acre cost of cultivation (paid out cost plus family labour) of wheat crop by beneficiary household was lower by around 18 per cent than non-beneficiary households, which was estimated to be Rs. 13924/- and Rs. 16490/-, respectively (Fig. 6). Per hectare wheat yield realized was marginally higher in case of beneficiary households (14.94 qtls) than non-beneficiary household (14.86 qtls). In both the cases, machine labour/power accounted for around 30 per cent of total cost, followed by seed and fertilizer (around 14% each), irrigation charges (around 11 per cent), harvesting and threshing (around 10 per cent). In case of non beneficiary households, hired labour accounted for 13.17 per cent of total cost, which is relatively very high as compared to 8.83 per cent in case of beneficiary households. Thus, due to high cost of cultivation and marginally lower yield realized by non-beneficiary households, cost per quintal of wheat was estimated to Rs. 1082/-, which was relatively higher than cost estimated for beneficiary households (Rs. 932/-). Therefore, profit on per quintal production of wheat was estimated to be Rs. 921/-, which was 28 per cent higher than profit/qlt estimated for non-beneficiary household (Rs. 716/qt.).




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- The variety-wise cost of cultivation estimates for wheat crop present mixed picture. The majority of beneficiary farmers had grown wheat GGW 496 variety, followed by Bhaliya 313, Lok 1 and GGW 173 variety. In case non beneficiary households, the variety preference sequence was as wheat GGW 496 variety, followed by GGW 173, Lok 1 and Bhaliya 313 varieties. It was noted that productivity level was higher in all four wheat varieties for beneficiary households. Except in case of Wheat variety CGW 496, cost of cultivation per acre in other three wheat varieties was estimated to be higher for beneficiary households than non-beneficiary households. Except in case of Wheat variety Lok 1, profit per quintal realized by beneficiary households was higher in cultivation of other wheat varieties. The highest profit on per quintal production of wheat crop was recorded in production of Bhaliya wheat (Rs. 1159/-) by beneficiary farmer whereas in case of non-beneficiary, highest profit/ql production was realized in Lok1 Wheat.

Marketed Surplus and Marketing Channels

- Out of total selected households, 79 per cent beneficiary households and 88 per cent of non-beneficiary households had sold their produce at various places. The details on marketing channels and marketed surplus of wheat with selected households indicated that about 95 per cent beneficiary farmers and about 99 per cent non beneficiary households had sold their output in wholesale market/regulated market. Remaining farmers sold their output in local market and to the merchants. Thus, selected farmers were well versed with the benefit of regulated market in sell of their output.


V. Participation Decision, Constraints and Suggestions for Improvement of NFSM

- In order to know the factors impacting the participation of farmers in NFSM, logit regression model using generalized liner model was used. The binary dependent variable was used as: 1 for NFSM beneficiaries; 0 for Non-beneficiary. The determinants/independent variables considered/used for analysis were age (years), education (code), total farming income




(Rs/annum), caste (code), no. of people engaged in farming/agriculture, net irrigated area (acre), asset value (Rs), and amount borrowed (Rs./acre).

- The results of logit model to determine the factor affecting the participation of farmers in NFSM estimated that out of the eight predictor variables as a factor affecting the participation of farmers in NFSM, only two predictor variables (i.e. number of people engaged in farming/agriculture and assets value) found be significantly influencing the decision on participation of farmers in NFSM. However, though net irrigated area (acres) seems to be important variable but statistically found insignificant. Increase in number of family member by a person increases the log odds of farmer participation in NFSM by 0.2429085 (coefficient value). Whereas in case of assets which also found influencing the decision of participation of farmer in NFSM, the log odds of farmer participation in NFSM is very weak. Thus, it indicates that larger the number of family members as well as number of assets, the log odds of farmer participation in NFSM is better. The factors like age, caste code and education code were found negative and statistically insignificant.
- About 11 per cent beneficiary farmers had faced some difficulties in availing the benefits under the NFSM. The most of the selected farmers have opined that major constraints faced by them were no technical advice/training under the programme was provided; no institutional financing facility was available under the programme. Most of the farmers mentioned that subsidy provided was biased towards large land owners. Some of the farmers mentioned that poor quality materials/machinery was supplied to them. Besides, they had to make payment for purchase before receiving subsidy which was the major problem faced by farmers.
- The suggestions for improvement of the NFSM scheme were collected from beneficiary households. On implementation and quality as well as quantity of benefit provided in scheme, about half of the respondent farmers had suggested that timely availability of seeds and other inputs should be ensured, while about 47 per cent respondents have mentioned that Gram



Sevaks/Gram Mitras should be provided regular training on accurate implementation of NFSM scheme as well as quality inputs should be supplied under NFSM. Besides, other major suggestions given by respondents farmers are input should be provided in more quantity/required quantity; kit should be provided as per suggestions given on soil health card; special gram sabha should be arranged to train/educate farmers or to raise the awareness level; more number of farmers should be involved and given training through farm demonstration/ Krishi Mahostav/ KVK/ SAUs and inadequate staff with implementing agency (State govt.) and present Staff loaded with huge work load, thus unable to justice with this scheme.


- Among the suggestions classified under subsidy given under scheme and additional requirement of subsidy under scheme, the major suggestions made the selected sample households were as: subsidy should be send directly in the beneficiary account; there should not be any time gap in release of subsidy benefit (as initial invest is very high and subsidy come very late); Subsidy for farm pond should given under this scheme; subsidies should be on given for field fencing to save crops from crop damaging animals; and subsidy amount on agricultural implement should be increased.
- The other important suggestions made by the selected farmers were that NFSM program is very useful scheme and it should be continued and therefore NFSM budget needs to be increased. The suggestion was also made for state government officials to implement the scheme with ATMA and to reduce farmer selection biasness.
- About 41 per cent responses suggested that no political influence/pressure should be entertained in implementation of scheme, while 26 per cent sample farmers suggested that information on NFSM should be provided/disseminated in local language. The other suggestions made by non beneficiary households are that due to low budget for NFSM scheme they could be benefited and therefore more budgets should be allocated. Also electricity supply should be regulated and should be made available for long duration was suggested by the farmers.

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- About 53 per cent farmers mentioned that they were unaware about the scheme, while 48 per cent farmers mentioned that scheme provides the inputs in limited quantity and not in time and therefore they did not participate in the scheme. The other reasons cited by the farmers were due to political influence/pressure in implementation of scheme as well as due to low budgeted amount in scheme, they were excluded. Some farmers mentioned that process was too lengthy whereas some farmers had received benefit in some other scheme.
 - More than 53 per cent non beneficiary households suggested that special gram sabha should be arranged to train/educate farmers or to raise the awareness level, 49 per cent farmers households suggested that gram Sevaks/Gram Mitras should be provided regular training on accurate implementation of NFSM schemes, 40 per cent farmers mentioned that NFSM allocation/ budget should be increased, 37 per cent respondents mentioned that there is inadequate staff with implementing agency (state govt.) and present staff is loaded with huge work load, therefore adequate staff should be made available to implement scheme properly and 28 per cent households suggested that more number of farmers should be involved and given training through farm demonstration/ Krishi Mahostav/ KVK/ SAUs.

VI. Policy Implications:

The policy implications emerged out of the study is as follows:


- The awareness level about the scheme need to increased/raised through holding gram sabha, group meetings and agricultural extensions programmes. The information on NFSM should be provided/disseminated in local language.
- The local distribution authorities such as Gram Sevaks/Gram Mitras should be provided regular training on accurate implementation of NFSM scheme.

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- The adequate allocation for various benefits under NFSM scheme should be made by taking into account the actual requirement of funds/allocation in particular area.
 - The government should ensure timely availability of benefits with utmost required quantity to farmer.
 - The government should ensure the adequate staff with implementing office in order to implement the scheme properly and successfully.
 - Farmers should be provided the training on various aspect of scheme through farm demonstration/ Krishi Mahostav/ KVK/ SAUs.
 - In case of some farm implement, more number of distributors should be identified so that farmer gets more options in selecting the instrument.
 - Bottom-up approach should be used in implementation of scheme.
 - The time lag between the paper work and allotment of sanction for purchase of tractor should be reduced and process should be made hassle free to farmer.



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Annexure I

Summary of Interventions and Pattern of Assistance in Wheat observed on Field (Ahmedabad and Banaskantha district of Gujarat)

A. Distribution of FLD (Field Demonstration) kit under NFSM-Wheat in Gujarat

District	Taluka	No. of Beneficiary	Total Cost (Av)	Subsidy Amount (Av)	Farmer's Share (Av)*	Input Distributed
Ahmedabad	Dholka	23	5482	4367	1345*	Wheat Seed (GW- 496)- 80 Kg., Pendimethalin -1- 2 Lit., Knap Sack Sprayer - 1 unit, Incentive for crop cultivation - 1000 Rs/Ha.
	Sanand	62	5661	3648	2297*	Wheat Seed (GW- 496)- 120 Kg., Pendimethalin-1- 2 Lit., Knap Sack Sprayer - 1 unit
Banaskantha	Kankrej	24	6559	5000	1559	Wheat Seed (GW- 496)- 100 Kg., Urea - 100 Kg., DAP - 100 Kg., Zink Sulphate -10 Kg. CloroPhos - 1 Lit., Pendimethalin -1 Lit., Azotobactor - .250 Lit,
	Palanpur	20	6427	5000	1427	Wheat Seed (GW- 496)- 80 Kg., Urea - 100 Kg., DAP - 100 Kg., Zink Sulphate -10 Kg. CloroPhos - 1 Lit., Pendimethalin-1 Lit., PHB - .250 Lit.

Note: * Farmer's share including Sanstha commission Rs.230 and 284 for Dholka and Sanand taluka.

Source : Field survey data.

B. District wise Laser Land Leveler distribution under NFSM-Wheat in Gujarat

District	Taluka	No. of Beneficiaries	Total Cost	Subsidy	Farmer's Share	Remark
Ahmedabad	Dholka	1	3.5 Lakh	1.5 Lakh	2 Lakh	-
	Sanand	1	3.5 Lakh	1.5 Lakh	2 Lakh	-
Banaskantha	Kankrej	0	0	0	0	-
	Palanpur	0	0	0	0	-

Source : Field survey data.

C. District wise Rotavator distribution under NFSM- Wheat in Gujarat

District	Taluka	No. of	Total Cost	Subsidy	Farmer's Share	Remark
Ahmedabad	Dholka	12	81792	30000	51792	-
	Sanand	0	0	0	0	-
Banaskantha	Kankrej	15	76533	30000	46533	-
	Palanpur	5	78900	30000	48900	-

Source : Field survey data.

D. District wise Seed Drill distribution under NFSM- Wheat in Gujarat

District	Taluka	No. of Beneficiary	Total Cost	Subsidy	Farmer's Share	Remark
Ahmedabad	Dholka	0	0	0	0	-
	Sanand	3	36000	15000	21000	-
Banaskantha	Kankrej	2	32500	15000	17500	-
	Palanpur	1	45000	15000	30000	-

Source : Field survey data.

E. District wise Multi crop Thresher distribution under NFSM-Wheat in Gujarat

District	Taluka	No. of	Total Cost	Subsidy	Farmer's Share	Remark
Ahmedabad	Dholka	1	60000	20000	40000	-
	Sanand	1	47500	20000	27500	-
Banaskantha	Kankrej	0	0	0	0	-
	Palanpur	0	0	0	0	-

Source : Field survey data.

F. District wise Pump Set distribution under NFSM- Wheat in Gujarat

District	Taluka	No. of	Total Cost	Subsidy	Farmer's Share	Remark
Ahmedabad	Dholka	6	24400	10000	14400	-
	Sanand	3	23833	10000	13833	-
Banaskantha	Kankrej	4	30500	10000	20500	-
	Palanpur	2	28600	10000	18600	-

Source : Field survey data.

G. District wise Knap Sack Sprayer distribution under NFSM- Wheat in Gujarat

District	Taluka	No. of	Total Cost	Subsidy	Farmer's Share	Remark
Ahmedabad	Dholka	8	4500	2000	2500	Battery Pump
	Sanand	5	3420	1710	1710	Hand pump
Banaskantha	Kankrej	0	0	0	0	Hand pump
	Palanpur	0	0	0	0	Hand pump

Source : Field survey data.

H.: District wise Gypsum distribution under NFSM- Wheat in Gujarat

District	Taluka	No. of	Total Cost	Subsidy	Farmer's Share	Remark
Ahmedabad	Dholka	0	0	0	0	-
	Sanand	0	0	0	0	-
Banaskantha	Kankrej	1	5650	1750	3900	3-10 Ton.
	Palanpur	15	3366	2008	1358	3-10 Ton

Source : Field survey data.

I: District wise Multi Zink distribution under NFSM- Wheat in Gujarat

District	Taluka	No. of Beneficiary	Total Cost	Subsidy	Farmer's Share*	Remark
Ahmedabad	Dholka	25	2090	1044	1150.5	10-50 Kg
	Sanand	1	1440	720	792	20 Kg
Banaskantha	Kankrej	41	700	350	385	10-20 kg
	Palanpur	34	1195	600	654.75	10-50 Kg

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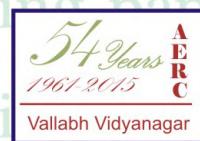
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Agro-Economic Research Centre

For the States of Gujarat and Rajasthan
(Ministry of Agriculture, Govt. of India)

H.M. Patel Institute of Rural Development
Opp. Nanadalaya Temple, Post Box No. 24

Sardar Patel University

Vallabh Vidyanagar 388120, Dist. Anand, Gujarat

Ph. No. +91-2692-230106, 230799; Fax- +91-2692-233106
Email: director.aerc@gmail.com; director.aercgujarat@gmail.com

Websites: www.aercspu.ac.in; www.spuvvn.edu