Impact of National Food Security Mission (NSFM) on Input Use, Production, Productivity and Income in Himachal Pradesh

C.S. Vaidya
Ranveer Singh

AGRO-ECONOMIC RESEARCH CENTRE
HIMACHAL PRADESH UNIVERSITY
SHIMLA-171005 (INDIA)

April 2015

About the Centre

The Agro-Economic Research Centre (AERC) of Himachal Pradesh University was established in December 1972 by the Ministry of Agriculture, Government of India to carry out research and investigations in the field of Agricultural Economics in Western Himalayan Region consisting of Himachal Pradesh and Jammu & Kashmir. This is one of the 12 AER Centres established by the Government of India. The thrust areas of the Centre include study of changes in rural economy; adhoc investigations of problems of interest to the Ministry of Agriculture, Government of India; research on fundamental problems relating to agricultural economics of the country and to provide technical advice to the Government of India and State Government on agro-economic issues. The AER Centre is fully financed by the Ministry of Agriculture, Government of India. The Centre has also been taking up some adhoc studies on behalf of or in collaboration with some other national and international agencies like World Bank, USAID, GTZ, ICIMOD, CIP, NJPC, SJVN and different Departments of State Government. The faculty members guide the Ph. D and M. Phil students of departments of Economics and Geography.

While program evaluation and impact evaluation studies continue to dominate the work program of the Centre, a large number of adhoc policy oriented studies have also been undertaken over these years. The research studies carried out by AER Centre cover a wide spectrum of issues in the field of agricultural economy. The AER Centre has expertise in conducting impact evaluation and economic feasibility studies for agriculture, horticulture, animal husbandry, forestry and rural development related activities. The Centre expertise in conducting techno economic feasibility of agricultural projects. Details at: www.aercshimla.org

Impact of National Food Security Mission (NSFM) on Input Use, Production, Productivity and Income in Himachal Pradesh

C.S. Vaidya
Ranveer Singh

AGRO-ECONOMIC RESEARCH CENTRE
HIMACHAL PRADESH UNIVERSITY
SHIMLA-171005 (INDIA)

April 2015

HIMACHAL PRADESH UNIVERSITY
Summer Hill, Shimla - 171005

Professor Arun Diwaker Nath Bajpai
Vice-Chancellor

FOREWORD

The National Food Security Mission was launched during October, 2007 in the country with the objectives of Increasing production of rice, wheat, pulses and coarse cereals through area expansion and productivity enhancement and simultaneously restoring soil fertility and productivity at the individual farm level thereby significantly improving farm level economy. The scheme has been implemented in 136 districts of 14 states for rice, 141 districts of 9 states for wheat 171 districts of 14 states for pulses in addition to existing Integrated Scheme of Oilseeds, Pulses, Oil palm & Maize (ISOPOM) districts. It was expected that the implementation of the scheme would increase the production of rice by 10 million tons, wheat by 8 million tons and pulses by 2 million tons by the terminal year of XI Five year Plan (2011-2012). The experience indicated that the focused approach of the mission with direct funding arrangement has been benefiting millions of farmers across the country in the targeted States and the Districts.

Himachal Pradesh was brought under NFSM during the year 2012-13, about five years later than most of the country. Due to this, the real benefits of the scheme will take some time to become apparent in the state. However, I expect that, the state is going to enjoy the benefits and the farmers of this hilly state will be able to significantly enhance the farm productivity and hence improve the farm economy.

I find that some of the programme components are not very relevant for hilly terrain of the state like heavy farm machinery and some other components require greater emphasis like irrigation, so important keeping in mind its present status in the state. This calls for greater inbuilt flexibility in the programme in selection of the project components within over all objectives. I hope this will be in minds of policy makers during the programme review or for some future programmes which might be in planning phase.

The Agro Economic Research Centre at this University undertook the present study for evaluating the programme implementation in Himachal Pradesh, which is an indicator of the valuable services that the Centre has been rendering in its field of specialization. The staff members of the Centre engaged in the study deserve appreciation in bringing out this volume for wider circulation. The findings of the study, it is hoped, will be found useful for proper implementation of the programmes and schemes of various government departments aimed at making the programme more valuable for the state.

I learn with pleasure that the authors will welcome the suggestions for their future guidance.

(Prof. A.D.N. Bajpai)
Vice-Chancellor
Himachal Pradesh University
Shimla

Date : April 18, 2015

Tel. No. 0177-2831363 (Off.), 0177-2815207 (Res.) Fax : 0177-2830775
E-mail : bajpaipersonal@yahoo.com Website : www.adnbajpai.org.

ACKNOWLEDGEMENTS

During the course of the study “Impact of National Food Security Mission (NFSM) on Input Use, Production, Productivity and Income in Himachal Pradesh” sponsored by Directorate of Economics and Statistics, Ministry of Agriculture, GoI, we came across many persons and departments which greatly helped and guided us for completing the study, satisfactorily. We are also grateful to Prof. Pramod Kumar, Director, ADRT Bangalore and Coordinator of the study, for his advice, support and valuable comments for improvement of the study at every stage.

We wish to acknowledge the cooperation extended by various officers of the department of agriculture, HP, during the data collection for the study. We are indebted to Dr. J.C. Rana, Director, Agriculture, HP for ensuring that we are entertained at every step of data collection. We are also thankful to Dr. V.K. Sharma, District Agriculture Officer Shimla Dr.. Kaushal, SMS, Directorate of Agriculture and Dr. Muneesh Sood ADO, Shimla. Deputy Director, Agriculture, Palampur, Dr. Desh Raj Sharma and ADOs and SMSs of Rampur and Rait blocks in district Shimla and blocks Rampur and Sunni of district Shimla deserve special thanks for their cooperation and assistance. We are also thankful to Sh. Prakash Chand and Sh. R.S. Palshara, AEOs of Jeori and Rampur, respectively.

We place on record our thanks to Prof. A.D.N. Bajpai, hon'ble Vice Chancellor, Himachal Pradesh University, Shimla, for his constant encouragement and valuable guidance so important in completing the study and making it richer.

In the end, we are grateful to the staff of Agro-Economic Research Centre, Himachal Pradesh University, Shimla and particularly Dr Partap Bhati, Mr Narender Kumar Sharma for coordinating field survey. They along with Dr. (Mrs.) Meenakshi were responsible for tabulation and analysis of the study and they deserve thanks for carrying out this job very efficiently. Mr. Chaman Lal Chauhan and Mrs.Meera Verma provided secretarial assistance and authors acknowledge their cooperation and efficiency. Last but not the least; I would like to thank Mr. Mast Ram, Driver, who never complained long drives and many times at very odd hours during data collection.

Shimla: 17th April 2015 Authors

CONTENTS

EXECUTIVE SUMMARY

Abstract

The National Food Security Mission (NFSM) was implemented in the state of Himachal Pradesh during the year 2012-13 and the present study has been conducted to evaluate the impact of NFSM on input use, production and income among the beneficiary farmers and to identify factors influencing the adoption of major interventions. The study also envisages identifying the constraints hindering the performance of the programme. The study reveals a definite improvement in net and gross irrigated area, net area sown, irrigation and cropping intensities and use of fertilizers during the 10th five year plan. The performance of NFSM districts in respect of area, production and yield of paddy and wheat was better as compared to Non-NFSM districts. It was found that the 'per household' agricultural income for NFSM category was higher but this income on 'per acre' basis was lower. Same was the case for total household income. Paddy, wheat and maize, the main cereal crops, were yielding positive returns in both cases but net returns from barley were negative on Non-NFSM farms. The cultivation of fruit and vegetables yielded significant income for farmers, per acre returns being higher for Non-NFSM farmers. The farm asset holding was quite meagre with almost absence of heavy machinery and equipments. The positive impact of programme is obvious in the farm of lower cost of cultivation as well as production for programme beneficiary farmers. The higher production of wheat has resulted in higher percentage of farmers generating marketable and marketed surplus. The analysis indicates that only the size of holding was the significant variable affecting the participation of respondents in the National Food Security Mission. There were no major constraints reported by the respondents in availing the programme benefits.

Objectives of the Study

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

Methodology

The study has been conducted in two districts viz Kangra and Shimla where the benefits of NFSM were extended for wheat crop (As per instructions of the study coordinator). Further, all development blocks in selected districts were listed and one located near to district headquarter and one at a distance of 15-20 Kms from it were to be selected with slight modification as per the advice of concerned officials of department of agriculture. In this manner, Kangra and Rait blocks in district Kangra and Rampur and Sunni in district Shimla were selected. Finally, a sample of 75 program beneficiary farmers and 25 non-beneficiaries were selected from four development blocks making a total sample of 300 programme beneficiary farmers and a control sample of 100 Non-NFSM farmers. The non-beneficiaries were selected from adjoining villages ensuring that they were operating under almost identical socio-economic and agro-climatic conditions.

Main Findings

The following text presents the main findings of the study.

Impact of NFSM on Food Grain Production in the State – A Time Series Analysis

The analysis indicates that during the 10th five year plan there was a definite improvement in net and gross irrigated area, net area sown which increased by net 0.29, 0.59, 0.33 and 0.10 per cent over the previous year. The irrigation and cropping intensities and use of fertilizers registered a change of 0.34, -0.30 and 1.76 per cent respectively. The increase of 1.76 per cent in fertilizer consumption was almost insignificant in comparison to corresponding increase during the year 2001-02. No conclusion could be drawn for 11th five year plan due lack of data.

There was not much change in area, production and yield of paddy during 10th five year plan as compared with 9th, the respective figures being -0.25, 10.12 and 10.41 per cent but during 11th plan there was definite decline with area and production declining by 2.72 and 1.27 per cent but productivity increasing by 1.50 per cent. However, there was decline in area, production and yield of wheat during successive plan periods. The rate of change in area slowed down from 1.05 to -0.36 per cent from 9th to 11th five year plan whereas the decline in production of wheat was from 153.49 to 2.31 per cent during this period. The change in productivity slowed from 151.16 to 2.67 per cent. There was almost absence of any definite trend in case of pluses.

The performance of NFSM districts in respect of area, production and yield of paddy was better as compared to Non-NFSM districts as judged by respective growth rates. During 11th five year plan the growth rates of area, production and yield were -0.10, 7.74 and 4.31 per cent in comparison to -1.02, 1.93 and 2.71 per cent respectively for Non-NFSM districts. More or less same picture emerged in case of wheat but trend was not as definite as in case of paddy. The growth rates of area, production and yield of wheat were -0.66, 7.30 and 8.41 per cent in comparison to -0.67, 7.29 and 8.01 per cent respectively for Non-NFSM districts. There comparison in case of pulses could be made in absence of NFSM districts.

During two years of the programme in the state, the funds made available for paddy were Rs. 444.06 lakhs and 482.75 lakhs during the years 2012-13 and 2013-14 which were completely utilized during the respective years. Same situation was observed in case of wheat with the funds of Rs. 1601.55 lakhs and 1632.31 lakhs during the years 2012-13 and 2013-14. There was no spillover of funds from one district to other as indicated by the outlays and expenditure for each district. During two years of the programme, Rs. 926.81 lakhs was the total outlay for paddy and Rs. 3233.86 lakhs for wheat.

There was mismatch between outlays and expenditure of category-wise interventions for both rice and wheat some components consuming more than their outlays. For rice, out of total outlay of Rs. 518.25 lakhs only 86.11 per cent could be spent. Similarly, for wheat the percentage achievement was about 93 per cent of the outlay of Rs. 2114.63 lakhs.

The analysis of correlation between changes in NFSM expenditure and irrigation/fertilizer could not be carried out in absence of data as the programme has been in operation only for two years.

Household Characteristics, Cropping Pattern and Production Structure

The average household size was slightly higher in case of Non-NFSM category (5.10 per sons). In NFSM households 74.38 per cent persons were engaged in farming as compared to 73.72 per cent in Non-NFSM households. Of total members of NFSM households, 41.16 per cent were males and 37.19 per cent females, respective figures for Non-NFSM category were 40.39 and 33.73 per cent.

Illiterates formed higher proportion of Non-NFSM category (15 %) but NFSM category had higher percentage of persons who had degree/diploma (4.66 %) or qualification above degree level (1 %). The NFSM category had higher percentage of SC/ST and OBC households, 12.67, 0.67 and 31.66 per cent respectively. Among Non-NFSM category, 20, 3 and 17 per cent households, respectively, belonged to these categories. The NFSM category households also enjoyed higher average annual income of Rs. 253353 from all sources and on comparison the average annual income of Non-NFSM category households was Rs. 226648 only. Larger area of Non-NFSM category farms was under marginal (81.19 %) but when holdings were analysed larger percentage of NFSM farms were under marginal category (82 %). The total average area operated by NFSM category farms was 1.28 acres, higher than 1.01 acres for Non-NFSM category. Same was the case for total owned land, average of 1.72 acre for NFSM farms and 1.39 Non- NFSM farms . Cropping intensity was marginally higher on NFSM farms (201.78 %) but case was just reverse in case of irrigation intensity which was 198.55 per cent for Non- NFSM farms. Tanks and open field channels were the only source of irrigation. These sources of irrigation were providing irrigation to 31.47 per cent of total area whereas on Non- NFSM farms only 28.17 per cent of the area was irrigated. Thus, the scenario of irrigation was slightly better on NFSM farms. The practice of leasing-in or out of the land was completely absent in both the categories of sampled farms.

Paddy, wheat and maize were main cereal crops on both categories of farms. Wheat was the major crop covering 38.03 per cent of the total gross cropped area on NFSM farms where as this percentage was 38.40 for Non- NFSM farms. Minor cereals and grams were grown only on NFSM farms on 0.86 and 0.12 per cent of GCA. Other pulses occupied 4.83 per cent of GCA only on NFSM farms and 6.96 per cent of GCA on Non-NFSM farms. The Non-NFSM farms preferred cultivation of fruit, as indicated by the area devoted for their cultivation whereas the vegetables were preferred crops on NFSM farms. The area under fruit occupied 9.71 per cent of GCA on NFSM farms and 11.83 per cent on Non-NFSM farms. The respective figures for vegetables were 3.91 and 2.56 per cent.

It was found that the 'per household' agricultural income for NFSM category was higher, Rs 152189 per annum as compared to Rs. 148018 for Non-NFSM category. But this income on 'per acre' basis was lower for NFSM category, Rs. 67938 as compared to Rs. 85857 for Non-NFSM category. Same was the case for total household income which was Rs. 207970 for NFSM category and Rs. 207322 for Non-NFSM category.

Paddy, wheat and maize, the main cereal crops, were yielding positive returns in both cases of NFSM and Non- NFSM categories. Net returns were higher for NFSM farmers in case of wheat and maize (Rs. 19346/acre and Rs. 4871/acre respectively) but in case of maize the Non- NFSM farmers were getting a net income of Rs. 31476/acre whereas income on NFSM farms was Rs. 26458/acre only. The net returns from barley were negative on Non-NFSM farms (Rs. 923/acre) but NFSM farmers were getting an income of Rs. 3191/acre. The cultivation of gram resulted in loss for NFSM farmers and net returns from other pulses were positive for both categories. The cultivation of fruit and vegetables yielded significant income for farmers. The per acre returns for Non-NFSM farmers from cultivation of fruit was Rs.604448/acre in comparison the NFSM farmers were getting net income of Rs. 530763/acre from fruit cultivation. Same pattern was observed in case of vegetables with Non-NFSM farmers getting net income of Rs. 72295/acre and NFSM farmers, only Rs. 530763/acre.

There was almost complete absence of heavy machinery and equipments on both categories of farms. This has been a result of poor economic standing of the farmers and the fact that these machinery and equipments are not compatible with hilly terrain of the state. The average value of tractors/mini tractors was only Rs. 1933 and Rs. 6400 per farm of NFSM and Non- NFSM categories. Only other equipments owned by farmers were sprayers, threshers and choppers.

The condition of indebtedness is highly satisfactory with only about five per cent of the households under debt from commercial banks taken for agriculture and utilized for the same purpose without any leakage for unproductive purposes.

NFSM Interventions and its Impact on Farming

The NFSM programme has only just begun in the state, despite that all the beneficiaries were aware of the programme and the department of agriculture being the only source of information. All the beneficiaries have availed the benefit of seed minikits. There was not impact of usage of farm equipments as these were made available under the programme. The benefit of seed minikits has resulted in increase in productivity in the range of 20-30 per cent and reduction in material cost by 15-20 per cent.

The positive impact of programme implementation is obvious in the farm of lower cost of cultivation as well as production for programme beneficiary farmers. The total cost of wheat cultivation on NFSM farms was Rs. 14869/acre which was Rs. 15617/acre for Non-NFSM farms. The gross and net incomes from wheat cultivation were also higher on NFSM farms. The NFSM farmers were generating a net income of Rs. 19340/acre and Non-NFSM farmers were getting only Rs. 17392/acre. The cost of wheat production on NFSM farms was Rs. 1247/qtl which was Rs. 1360/qtl for Non-NFSM farmers.

The higher production of wheat has resulted in higher percentage of farmers (69.33 % NFSM farmers in comparison to only 50 % Non-NFSM farmers) who were able to generate marketable and marketed surplus. The percent of value marketed was also higher for NFSM farmers. This calls for programme implementation in full earnest so that larger number of farmers is benefited located in larger geographic area and the extent of benefits is also improved. This will also be important to implement all the programme components to make the programme effective.

Participation Decision, Constraints and Suggestions for Improvement of NFSM

The analysis indicates that only the size of holding was the significant variable affecting the participation of respondents in the National Food Security Mission. The value of coefficient of this variable was 1.4978 and was significant at one per cent level of probability. There were no major constraints reported by the respondents in availing the programme benefits. Major suggestions for improving the quality and efficacy of the programme were inclusion of irrigation as a major programme component and extension of the programme to all other major crops. The non-beneficiaries of the programme wanted wider publicity of the programme and widening of its scope.

CHAPTER 1

INTRODUCTION

1.1 Introduction

The concept of food security concerns itself with the situation of current availability of food at different levels, household, state and national levels. This is not a concept of recent origin as the evidences of granaries in ancient China and Egypt have been discovered. These granaries were used to provide food at the time of famines ensuring food security during the distress times. However, it was not until 1974 World Food Congress (held in the wake of the devastating famine in Bangladesh in the preceding two years) that the term of 'food security' became a formal concept. Then also, the concept of food security was applied only at the national level. A state was considered food secure when there was sufficient quantity of food to sustain a steady expansion of food consumption and to offset fluctuations in production and prices. A new definition emerged at 1996 World Food Summit. Now the emphasis was on individuals enjoying food security, rather than the nation. According to the Food and Agriculture Organization (FAO), food security "exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life".

Household food security exists when all members, at all times, have access to enough food for an active, healthy life. Individuals who are food secure do not live in hunger or fear of starvation. On the other hand, according to the United States Department of Agriculture (USDA), food insecurity, is a situation of "limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways". Food security incorporates a measure of resilience to future disruption or unavailability of critical food supply due to various risk factors including droughts, transportation problems, fuel shortages, economic instability, and wars. The FAO identified the four pillars of food security as availability, access, utilization, and stability. The United Nations (UN) recognized the Right to food in the Declaration of Human Rights in 1948, and has since noted that it is vital for the enjoyment of all other rights.

According to report of Food and Agriculture Organization on 'The State of Food Insecurity in World' brought out during the year 2013, a total of 842 million people in 2011–13, or around one in eight people in the world, were estimated to be suffering from chronic hunger, regularly not getting enough food to conduct an active life. This figure is lower than the 868 million reported with reference to 2010–12. The total number of undernourished has fallen by 17 percent since 1990–92.

1.2 The Indian Context

It has been observed that even though the proportion of the malnourished fell by about 1 percent through the nineties in India, their absolute number increased by about 18 million. Thus, the problem of food insecurity in India is not of general systemic failure that arises due to a supply shortage. It is in fact more a problem where certain sectors (mainly the rural agrarian population and the urban informal sector) suffer from a shortage of food in a general climate of increasing production.

Despite the fact that there has been an impressive economic growth in recent years, widespread poverty and hunger still remains a dominant concern. About 300 million of India's population is still considered to be living in poverty, with almost 30 percent of India's rural population living in poverty. The good news is, poverty has been on the decline in recent years. According to official government of India estimates, poverty declined from 37.2% in 2004-05 to 29.8% in 2009-10. Rural poverty declined by 8 percentage points from 41.8% to 33.8% and urban poverty by 4.8 percentage points from 25.7% to 20.9% over the same period.[1]

India is home to 25 percent of the world's hungry population. An estimated 43 per cent of children under the age of five years are malnourished. India remains an important global agricultural player; despite the fact that agriculture's share in the country's economy is declining. It has the world's largest area under cultivation for wheat, rice, and cotton, and is the world's largest producer of milk, pulses, and spices. Nearly three-quarters of India's households are dependent on rural incomes. Agricultural productivity in the country's semi-arid tropical region is impeded by water shortages and recurrent droughts, while environmental degradation and vulnerability to weather-related disasters pose challenges to the country as a whole.

Poor populations also face a lack of access to productive assets, financial resources, education, health care, and basic social services. The government has recently begun to focus on microenterprise development as a way to address these challenges, as well as initiatives to bring basic services to the rural poor. With the country's population and economy continuing to grow, huge demands will be placed on critical infrastructure in the coming years. It is estimated that US$1 trillion will be needed to meet India's infrastructure needs in the next five years (World Bank 2012).

1.3 Nation Food Security Mission

It was with this background that the National Development Council (NDC) resolved to launch a Food Security Mission for the crops; rice, wheat and pulses. This decision was taken in its 53rd meeting held on 29th May, 2007. The objective was to increase the production of rice by 10 million tons, wheat by 8 million tons and pulses by 2 million tons by the end of the Eleventh Plan (2011-12). Accordingly, a Centrally Sponsored Scheme, 'National Food Security Mission' (NFSM), was launched in October 2007. The Mission is being continued during 12th Five Year Plan with new targets of additional production of food grains of 25 million tons of food grains comprising of 10 million tons rice, 8 million tons of wheat, 4 million tons of pulses and 3 million tons of coarse cereals by the end of 12th Five Year Plan.

1.3.1 Mission Objectives

The National Food Security Mission was launched with following objectives:

- Increasing production of rice, wheat and pulses through area expansion and productivity enhancement in a sustainable manner in the identified districts of the country;
- Restoring soil fertility and productivity at the individual farm level;
- Creation of employment opportunities; and
- Enhancing farm level economy (i.e. farm profits) to restore confidence amongst the farmers.

1.3.2 Strategy

The following strategy has been adopted for meeting out the laid down objectives:

- Implementation in a mission mode through active engagement of all the stakeholders at various levels.
- Promotion and extension of improved technologies i.e., seed, Integrated Nutrient
- Management including micronutrients, soil amendments, IPM and resource conservation technologies along with capacity building of farmers.
- Flow of fund would be closely monitored to ensure that interventions reach the target beneficiaries on time.
- Various interventions proposed would be integrated with the district plan and targets for each identified district would be fixed.

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

Since the NFSM has been in operation in the country for the last about seven years, it is pertinent to evaluate whether the mission has been able to achieve its objectives, or not. Thus, a study at all India level has been planned with following specific objectives.

1.4 Objectives of the Study

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

1.5 Methodology

As per approved proposal of the study, wheat crop was selected in the state of Himachal Pradesh among the NFSM implemented districts for detailed study. Two districts viz Kangra and Shimla have been selected according to criterion of districts having highest and lowest wheat production during the latest triennium of 2010-11 to 2012-13. On this consideration, district Kangra having highest average production (218.63 thousand MT) and district Shimla with lowest figure of only 18.59 thousand MT were selected.

During the next stage of sampling all the development blocks in selected districts were listed and one located near to district headquarter and one at a distance of 15-20 Kms from it were to be selected. However, in present study, this criterion was slightly modified as per the advice of concerned officials of department of agriculture, because as per their advice the NFSM activities were not uniformly distributed across the blocks and in some the blocks the activities just started making it evident that hardly any noticeable impact may be visible. Thus, Kangra and Rait blocks in district Kangra and Rampur and Sunni in district Shimla were selected.

Finally, a sample of 75 program beneficiary farmers and 25 non-beneficiaries were selected ensuring fair representation of different class categories in the sample and as large a geographic coverage as possible. For this purpose complete lists of beneficiaries were obtained from concerned officials. The non-beneficiaries were selected from adjoining villages ensuring that they were operating under almost identical socio-economic and agro-climatic conditions. The sampling procedure has been summarized in figure-1.1.

1.5.1 Data Collection

Data has been collected from selected farmers by personal interview method on schedules designed and provided by the Coordinator of the study. The primary data thus collected has been supplemented with the secondary data from official records of department of agriculture.

1.5.2 Analysis

Simple tabular analysis has been used in the study to arrive at the conclusions. However, in order to find out the factors influencing the participation of beneficiaries in NFSM programme, Logistic regression model has been used which is a variation of ordinary regression, used when the dependent

(response) variable is a dichotomous variable taking only two values representing the occurrence or non-occurrence of some outcome event, usually coded as 0 or 1 and the independent variables are continuous, categorical, or both. In the present case the participation in NFSM has been regressed with the factors like age, education, family and holding size, caste, extent of irrigation and use of credit for agricultural purposes etc. These variables have been considered important as the participation is likely to be highly influenced with level of education making him/her more adaptive for reaping benefits of development programmes. Young aged decision makers are more likely to take try new things, justifying inclusion of age of the decision maker as an independent variable for determining the participation in the programme. The farmers having larger land holdings have higher risk bearing ability hence may like to try and opt for participation. Similarly, higher income, level of irrigation and availability of credit are expected to influence the farmers' decision of participation in a positive manner. This justifies the inclusion of these variables in the model.

Unlike ordinary linear regression, logistic regression does not assume that the relationship between the independent variables and the dependent variable is a linear one. Nor does it assume that the dependent variable or the error terms are distributed normally.

The form of the model is:

$$\log\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + ... + \beta_k X_k$$

where p is the probability that Y=1 and X_1, X_2,.. .,X_k are the independent variables (predictors). β_0, β_1, β_2, ... β_k are known as the regression coefficients, which have to be estimated from the data. Logistic regression estimates the probability of a certain event occurring.

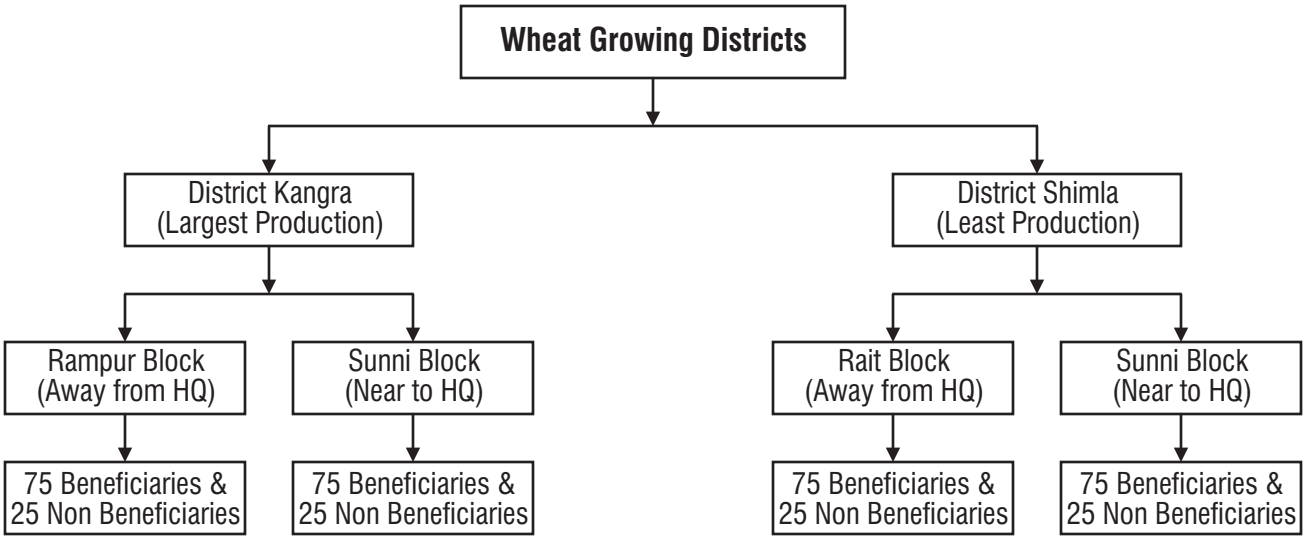


Fig. 1.1: Sampling Details

CHAPTER 2

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

The present chapter has been devoted to work the impact of NFSM on the food grain production and this has been attempted through the time series analysis of production and related parameters. The analysis has been carried out for previous three plan periods; 9th to 11th five year plans. The following paragraphs detail the results of the analysis in this respect.

2.1 Trends in Area, Irrigation and Fertilizer Use

It is indicated that during the 9th five year plan, the net irrigated area increased by 0.96 per cent average annual growth rate (AAGR) whereas this figure for gross irrigated area was only 0.09 per cent. The decline in net area sown was 0.47 per cent but the percentage of net irrigated area to net area sown increased by 1.36 per cent. The positive outcome during this period was that the irrigation intensity increased by about 1.22 per cent during this period but cropping intensity declined marginally by 0.29 per cent. The use of fertilizer registered a significant increase of 10.02 per cent, Table-2.1 presents the details.

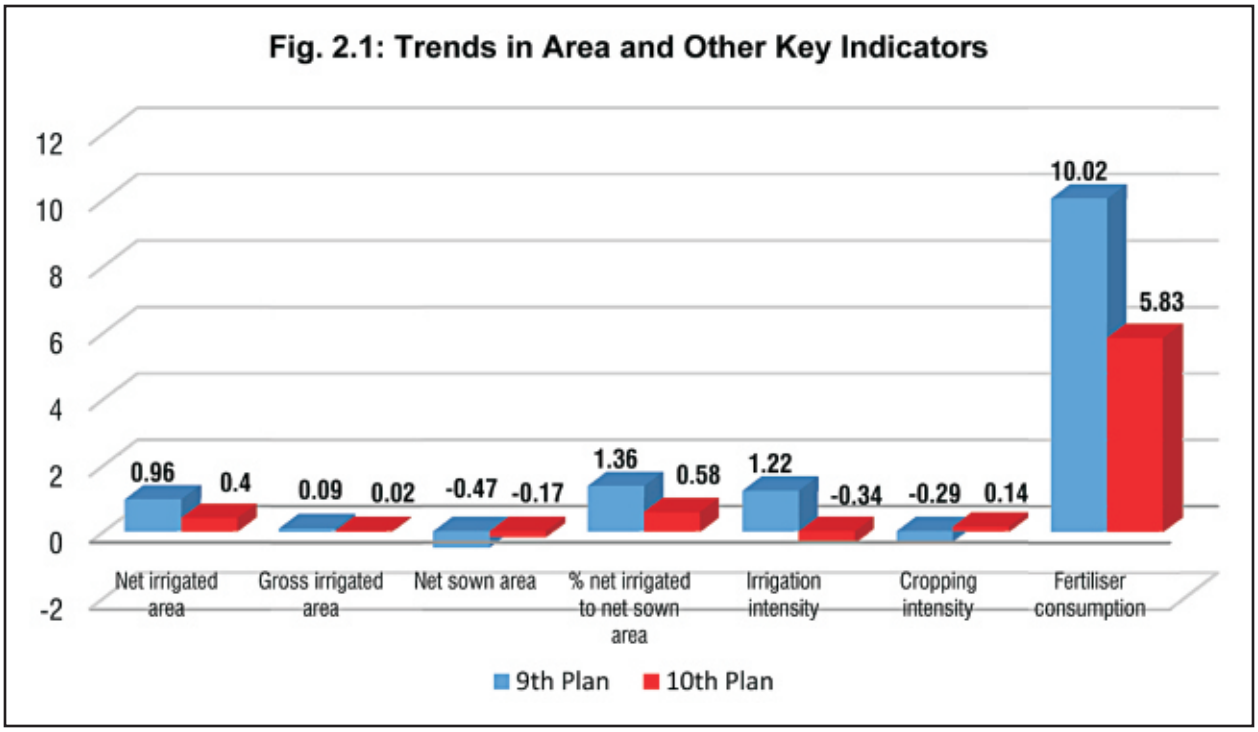
In comparison to 9th five year plan, during the 10th plan, the trends in almost all the parameters under consideration weakened. The net irrigated area increased marginally by 0.40 per cent whereas the gross irrigated area increased by 0.02 per cent only. The net area sown registered a decline of only by 0.17 per cent, an improvement over decline of 0.47 per cent during previous plan period. But the AAGR of net irrigated area to net area sown was 0.48 per cent a clear-cut weakening in comparison to 9th plan. During this period the irrigation intensity and cropping intensity had opposite trends, former declining by 0.34 per cent but the later registering a increasing of 0.14 per cent. However, there was increase of 5.83 per cent in fertilizer consumption.

This analysis for the 11th plan period could not be carried for the reason that the relevant information was not available. Despite this, whatever information was available has been presented in Table-2.1.

Table 2.1: Trends in Area and Fertilizer Use – Himachal Pradesh

Year	Net irrigated Area (lakh ha)	Gross irrigated Area (lakh ha)	Net sown area (lakh ha)	% net irrigated to net sown area	Irrigation intensity (%)	Cropping intensity (%)	Fertiliser Consumption (Kg/ha of NSA)
1	2	3	4	5	6	7	8
1997-98	1.026	1.804	5.601	18.32	175.82	176.08	62.22
1998-99	1.015	1.826	5.494	18.47	179.84	176.57	70.18
1999-00	1.019	1.787	5.515	18.48	175.35	173.50	67.72
2000-01	1.255	1.813	5.546	22.63	144.43	178.58	44.10
2001-02	1.021	1.810	5.496	18.58	177.23	173.88	73.06
9th Plan Avg. AGR*	0.96	0.09	-0.47	1.36	1.22	-0.29	10.02
2002-03	1.023	1.866	5.446	18.78	182.43	173.57	72.94
2003-04	1.051	1.811	5.405	19.44	172.36	176.80	86.60
2004-05	1.045	1.830	5.426	19.25	175.17	176.56	85.25
2005-06	1.036	1.855	5.390	19.23	179.03	175.03	89.00
2006-07	1.039	1.866	5.408	19.21	179.63	174.51	90.57
10th Plan Avg. AGR	0.40	0.02	-0.17	0.58	-0.34	0.14	5.83
2007-08	0.935	N.A.	5.079	18.42	N.A.	N.A.	98.36
2008-09	1.079	N.A.	5.395	19.99	N.A.	N.A.	106.33
2009-10	1.056	N.A.	5.384	19.61	N.A.	N.A.	98.88
2010-11	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
2011-12	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
11th Plan Avg. AGR	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

Source: Directorate of Economics and Statistics, H.P.



2.2 Trend in Area, Production and Yield of Paddy and Wheat

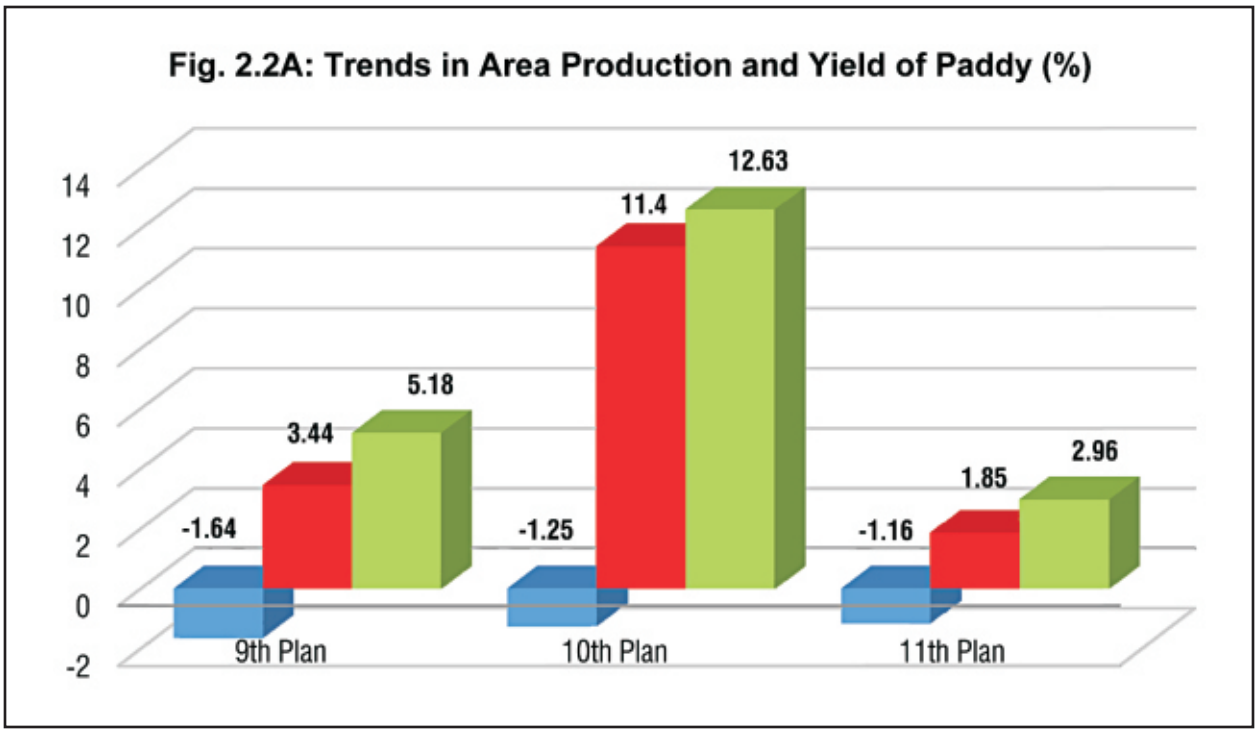
The trends in area, production and productivity of wheat and paddy for the three plan periods have been presented in Table-2.2 wherein it may be seen that the despite of decline of 1.64 per cent in area under paddy, during this plan period, the production increased by 3.44 per cent and productivity by 5.18 per cent during the same period. This trend was more pronounced in case of wheat. The AAGR of area was -0.71 per cent, the production and productivity registered AAGR of 23.20 and 23.47 per cent respectively. The increase in production and productivity of wheat were noteworthy.

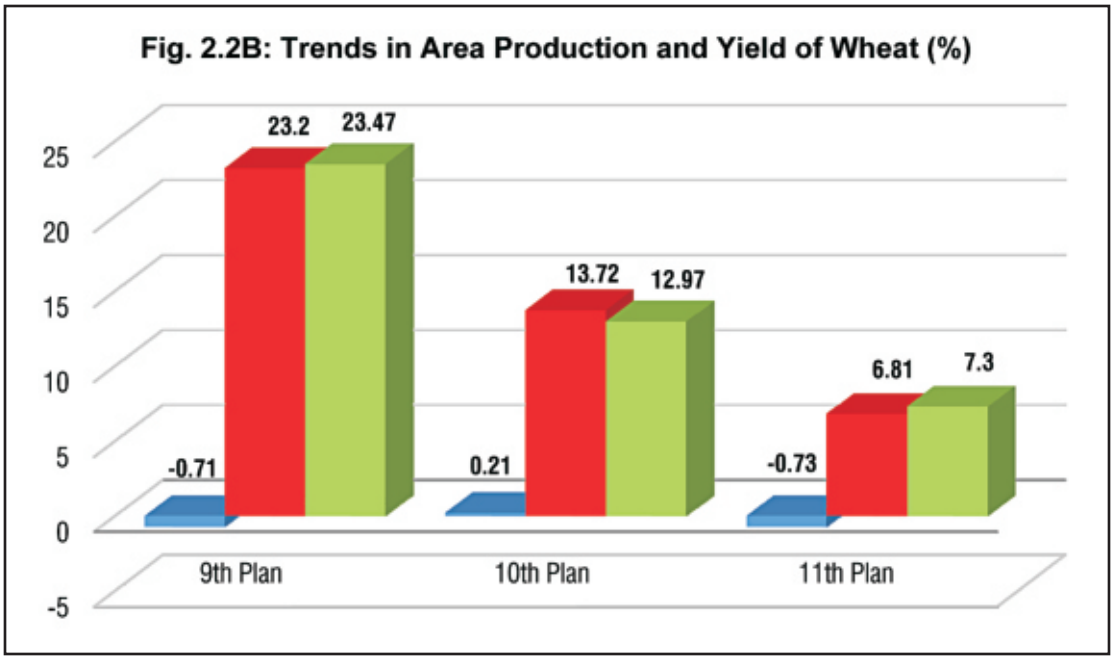
The same trend continued during the 10th plan with paddy area declining by 1.25 per its production and productivity increasing by AAGR of 11.40 and 12.63 per cent respectively. The trends in area, production and productivity of wheat were almost identical with AAGR of area having positive value of 0.21 per cent but the increase in production and productivity were not as spectacular when compared to 9th plan. The AAGR of production and productivity of wheat were 13.72 and 12.97 per cent respectively.

During 11th five year plan the declining trend of area under paddy continued but improved with AAGR of -1.16 per cent, being lowest among three plan periods. But the performance in respect of production and productivity of paddy was not much as compared to previous plan period. The AAGR of production and productivity were 1.85 and 2.96 per cent respectively, significantly lower than previous plan periods. Same situation could be seen in case of wheat as well with area declining by AAGR of 0.73 per cent but production and productivity increased by 6.81 and 7.30 per cent respectively. The further details can be referred to from the Table-2.2.

Table 2.2: Trends in Area, Production and Yield of Paddy and Wheat – Himachal Pradesh

Year	Paddy			Wheat		
	Area (lakh ha)	Production (Tons)	Productivity (Qtls/ha)	Area (lakh ha)	Production (Tons)	Productivity (Qtls/ha)
1997-98	0.862	120444	13.97	3.773	641305	16.99
1998-99	0.828	117750	14.22	3.797	481267	12.67
1999-00	0.802	120365	15.00	3.706	583300	15.73
2000-01	0.815	124893	15.32	3.627	251339	6.92
2001-02	0.806	137418	17.05	3.665	637068	17.38
9th Plan Avg. AGR	-1.64	3.44	5.18	-0.71	23.20	23.47
2002-03	0.833	85653	10.25	3.594	495557	13.78
2003-04	0.813	120624	14.83	3.634	496930	13.67
2004-05	0.795	109129	13.72	3.678	687452	18.69
2005-06	0.794	112139	14.12	3.585	365885	10.20
2006-07	0.792	123485	15.59	3.622	596493	16.46
10th Plan Avg. AGR	-1.25	11.04	12.63	0.21	13.72	12.97
2007-08	0.786	121453	15.45	3.666	562007	15.33
2008-09	0.777	118277	15.22	3.600	381180	10.58
2009-10	0.767	105900	13.80	3.525	414407	11.75
2010-11	0.771	128917	16.72	3.572	614891	17.21
2011-12	0.750	127284	16.97	3.559	629091	17.67
11th Plan Avg. AGR	-1.16	1.85	2.96	-0.73	6.81	7.30

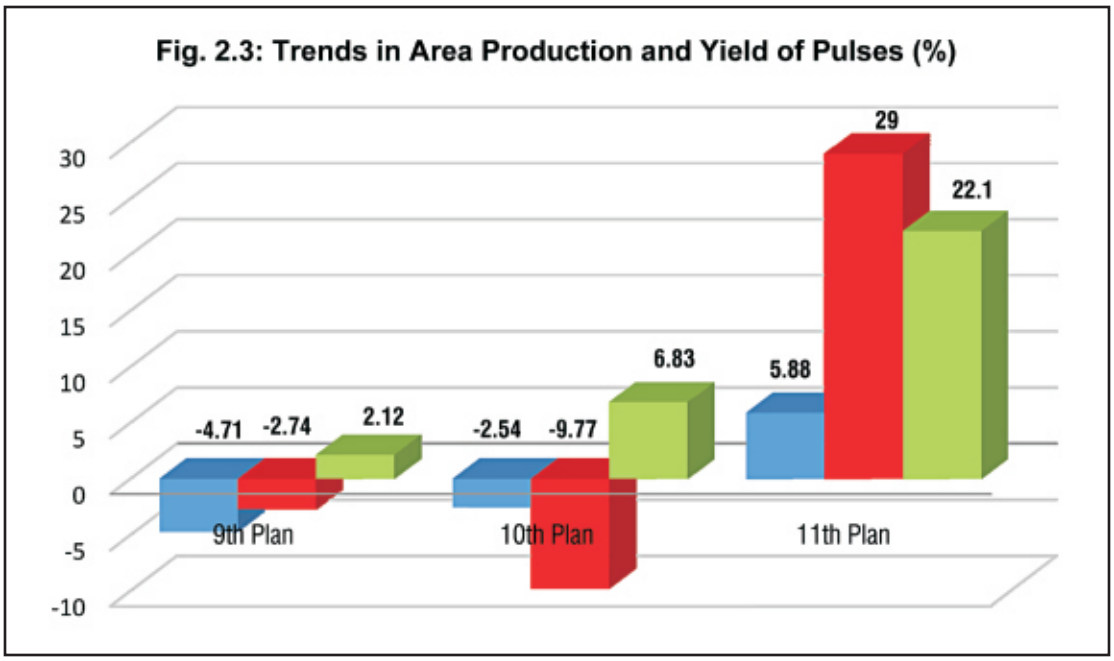




The analysis in respect of pulses indicates a decline of 4.71 per cent in AAGR of the area under pulses during 9th five year plan with a similar decline in the production by 2.74 per cent. However, the productivity increased by 2.12 per cent (Table-2.3). The trend in area was declining during the 10th plan as well but the decline of AAGR was only 2.54 per cent. The production and productivity, both, declined during this plan period. The AAGR of production was -9.77 per cent and that of productivity was -6.83 per cent. The picture appears to be much improved during 11th five year plan with all the variables having positive values. During this plan period, AAGR of area under pulses was 5.88 per cent and that of production and productivity 29.00 and 22.10 per cent respectively.

Table 2.3: Trends in Area, Production and Yield of Pulses – Himachal Pradesh

Year	Pulses		
	Area (lakh ha)	Production (Tons)	Yield (Qtls/ha)
1997-98	0.359	25717	7.16
1998-99	0.338	23771	7.02
1999-00	0.326	24316	7.46
2000-01	0.311	20460	6.58
2001-02	0.296	22542	7.63
9th Plan Avg. AGR	-4.71	-2.74	2.12
2002-03	0.301	19206	6.37
2003-04	0.289	13884	4.81
2004-05	0.280	13335	4.77
2005-06	0.330	14464	4.38
2006-07	0.261	12164	4.65
10th Plan Avg. AGR	-2.54	-9.77	-6.83
2007-08	0.319	20147	6.30
2008-09	0.312	23510	7.54
2009-10	0.212	20660	9.73
2010-11	0.337	40875	12.13
2011-12	0.333	46420	13.95
11th Plan Avg. AGR	5.88	29.00	22.10



2.3 AGR of Area, Production and Yield of Paddy

In order to understand the impact of National Food Security Mission on area, production and productivity, it is prerequisite to find out the rate at which these parameters have been changing prior to current development intervention. It is with this view that the growth rates of area, production and productivity for paddy, wheat and pulses have been worked out for three plan periods and for NFSM and Non-NFSM districts of the state. The following paragraphs present the results of this analysis.

2.3.1 Paddy

There are only three districts covered under NFSM for paddy crop in the state viz Mandi, Kangra and Sirmour. In all other districts provisions of NFSM have not been implemented so far. The growth rates for area, production and productivity of paddy for three plan periods and for NFSM and Non-NFSM districts of the state have been presented in Table-2.4. It is observed that the growth rates for area, production and productivity were positive during 9th five year plan in NFSM districts but in Non-NFSM districts only yield registered a positive growth rate of 1.65 per cent per year. At overall level of the state area under paddy declined at the rate of 1.48 per cent per year, production and yield increasing at the rate of 3.28 and 4.83 per cent per year respectively. It is evident that the performance of NFSM districts was definitely better in comparison to rest.

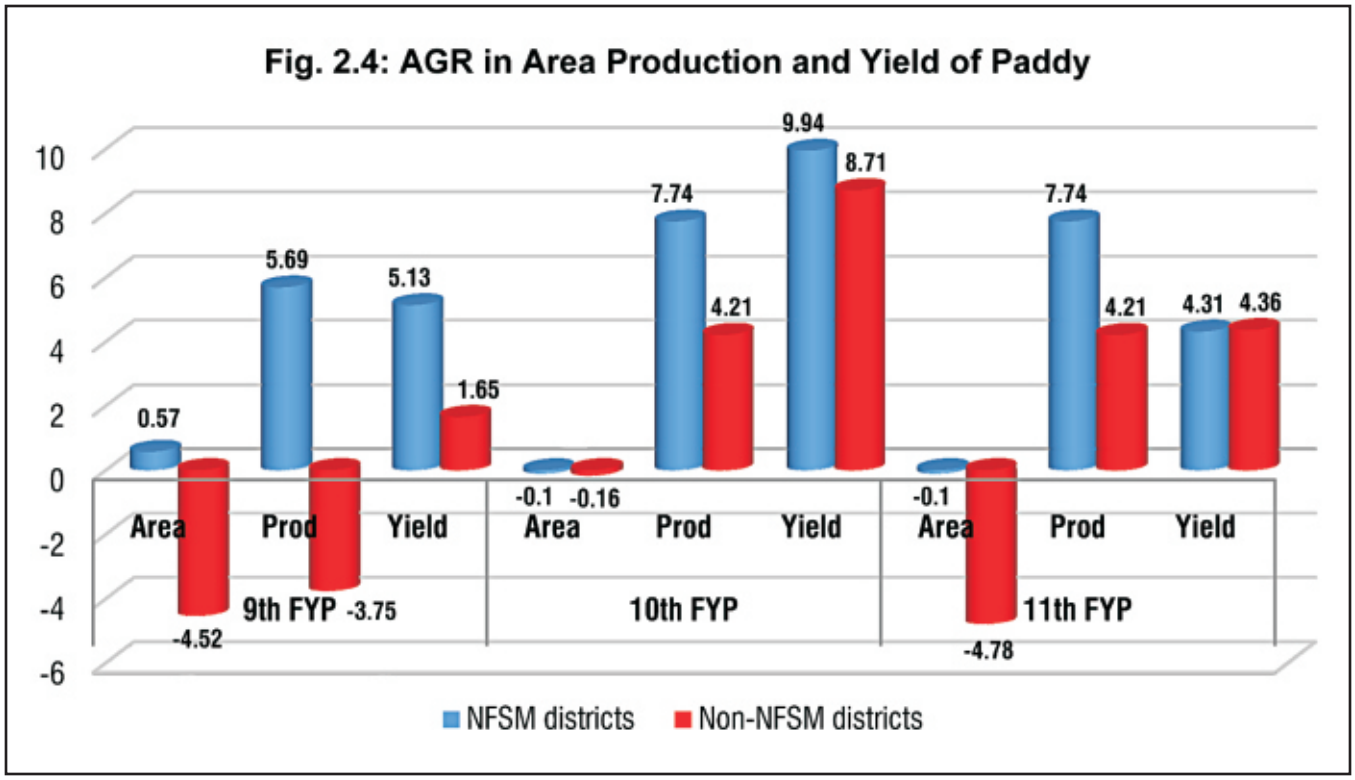
During 10th five year plan the area under paddy declined in NFSM and Non-NFSM districts both at the rate of 0.10 and 0.16 per cent respectively, whereas at the state level it declined at the rate of 1.24 per cent per year. The rates of increase of production and yield were 7.74 and 9.94 per cent in NFSM districts indicating better performance in comparison to Non-NFSM districts where these figures were 4.21 and 8.71 per cent respectively. At the state level, production and yield increased at the rate of 6.81 and 8.15 per cent respectively.

The overall picture during 11th five year plan did not change much. The area had negative growth rate invariably but production and yield had positive growth rates under all the three situations. However, the NFSM districts continued to perform better as decline in area was at a far slower rate in NFSM districts, the increase in production at much higher rate and productivity remaining almost same.

It can therefore be concluded that the NFSM districts invariably performed better in comparison to Non-NFSM districts during reference period of study.

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

Districts	9th FYP			10th FYP			11th FYP		
	Area (%)	Production (%)	Yield (%)	Area (%)	Production (%)	Yield (%)	Area (%)	Production (%)	Yield (%)
NFSM Districts									
Mandi	-2.52	3.48	6.15	-1.11	3.87	5.03	-1.08	3.71	4.85
Kangra	-0.19	6.68	6.88	0.38	8.56	8.15	-0.05	3.24	3.29
Sirmour	-4.46	7.54	2.95	0.32	15.67	15.30	2.84	8.33	5.34
Sub total	0.57	5.69	5.13	-0.10	7.74	9.94	-0.10	7.74	4.31
Non-NFSM Districts									
Bilaspur	-8.95	-10.32	-1.50	-2.06	37.19	40.06	-4.97	-12.72	-8.16
Chamba	-1.69	-1.63	0.06	-0.35	-4.01	-3.68	7.94	14.93	6.47
Hamirpur	-3.27	-5.40	-2.21	-14.49	1.97	19.25	-2.56	-4.18	-1.66
Kullu	-10.52	-6.12	4.83	-3.26	-10.18	8.15	0.89	4.10	0.00
Kinnaur	4.75	9.54	4.92	-4.00	3.89	-7.16	0.00	0.00	3.18
L&S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Shimla	-6.33	-8.76	-2.61	-13.71	-7.54	7.15	-4.27	4.83	9.50
Solan	-3.80	-2.22	1.65	5.20	15.92	10.19	-20.5.	-20.62	-0.11
Una	0.39	0.52	0.92	-8.41	-2.14	6.85	-3.31	-0.54	2.87
Sub total	-4.52	-3.75	1.65	-0.16	4.21	8.71	-4.78	4.21	4.36
Grand total	-1.48	3.28	4.83	-1.24	6.81	8.15	-1.02	1.93	2.74



2.3.2 Wheat

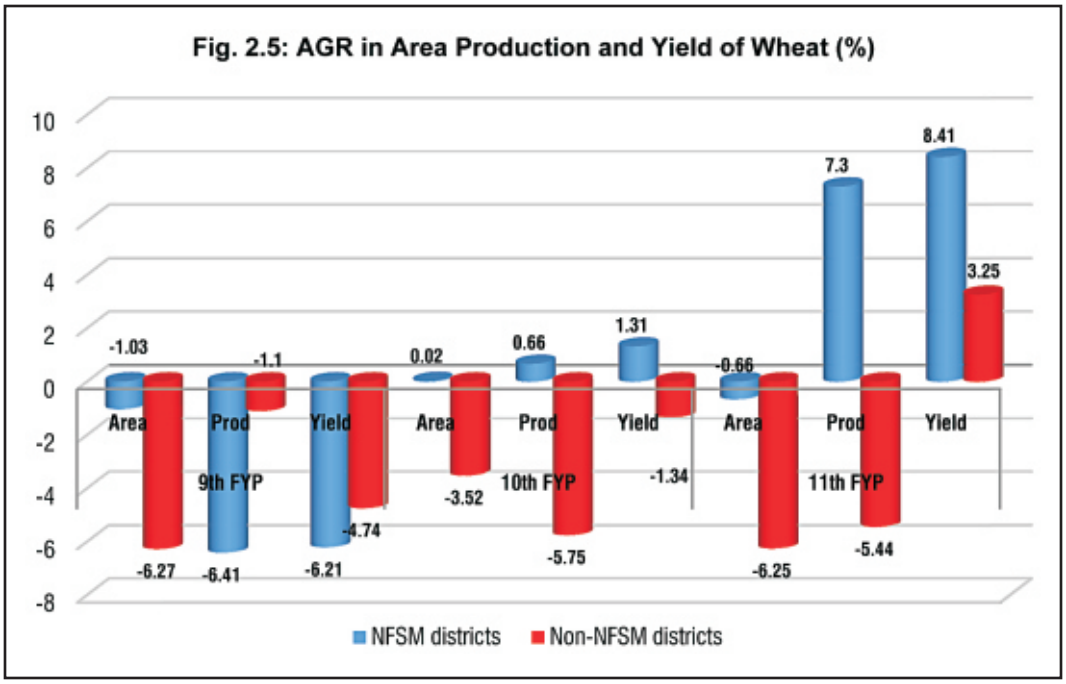
The growth rates for area, production and productivity of wheat have been presented in Table-2.5 for three plan periods and for NFSM and Non-NFSM districts of the state. The benefits of NFSM for wheat are available in all the districts of the state except for tribal districts of Kinnaur and Lahaul-Spiti. During 9th five year plan the growth rates of area, production and yield were negative in the NFSM district as well as Non-NFSM districts. However, the decline in area was only at the rate of -1.03 percent in comparison to -6.27 per cent under Non-NFSM districts. But the position of NFSM districts was worse in respect of growth rates of production and yield. These rates were -6.41 and -6.21 respectively as compared to -1.10 and -4.74 in Non-NFSM districts. At overall level the area, production and yield of wheat declined at the rate of 1.04, 6.41 and 5.43 per cent per annum during 9th five year plan.

During 10th five year plan the performance improved significantly and all the growth rates in NFSM districts became positive. The area, production and yield increased at the rate of 0.02, 0.66 and 1.31 per cent respectively. But the performance of Non-NFSM districts did not show any significant improvement and these parameters continued to decline at the rate of 3.52, 5.75 and 1.34 per cent per year respectively. At the overall level of the states all the growth rates were positive but less than one.

The growth rates of production and yield further strengthened during 11th five year plan and were 7.30 and 8.41 per cent respectively. But the growth rate of area again slipped to -0.66 per cent per year. On the other hand the area and production of wheat in Non-NFSM districts registered a declined trend of 6.25 and 5.44 per cent respectively. However, the productivity for the first time showed the sign of improvement and the growth rate in this respect was 3.25 per cent per annum. In the state during this plan the area registered a slight declined with a negative growth rate of 0.67 per cent whereas the production and yield increased at a healthy growth rate of 7.29 and 8.01 per cent per annum respectively.

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

Districts	9th FYP			10th FYP			11th FYP		
	Area (%)	Production (%)	Yield (%)	Area (%)	Production (%)	Yield (%)	Area (%)	Production (%)	Yield (%)
NFSM Districts									
Mandi	-1.38	-1.88	+0.50	0.04	-0.92	-0.96	-8.32	12.27	10.83
Kangra	-0.07	-4.50	-4.43	-0.26	-0.38	-0.12	-0.48	5.53	6.04
Sirmour	-0.36	-10.69	-3.80	0.75	-1.20	-1.94	-6.85	2.58	2.78
Bilaspur	0.34	-17.10	-17.38	-0.56	-0.11	0.45	-0.88	13.74	14.75
Chamba	1.85	1.53	-0.34	-0.92	2.86	3.82	-1.19	12.66	14.02
Hamirpur	-0.39	-17.02	-16.69	-0.49	2.04	2.55	-0.79	10.25	11.12
Kullu	-0.01	-0.51	-0.50	6.16	8.32	2.04	-7.50	-10.04	-2.75
Shimla	-11.70	-16.79	-5.76	-4.79	-1.82	3.11	1.30	6.00	13.79
Solan	-0.13	-4.15	-13.17	2.55	8.57	5.87	-0.20	11.00	11.74
Una	-1.42	-13.28	-9.40	-1.89	-6.50	-4.70	-0.67	10.55	8.51
Sub Total	-1.03	-6.41	-6.21	0.02	0.66	1.31	-0.66	7.30	8.41
Non-NFSM Districts									
Kinnaur	-5.23	-9.51	-4.52	-1.00	-4.45	-3.46	-5.65	-6.46	-0.83
L&S	-9.33	-14.30	-5.43	-12.33	-11.77	0.63	1.87	-1.25	7.93
Sub Total	-6.27	-1.10	-4.74	-3.52	-5.75	-1.34	-6.25	-5.44	3.25
Grand Total	-1.04	-6.41	-5.43	0.02	0.65	0.63	-0.67	7.29	8.01



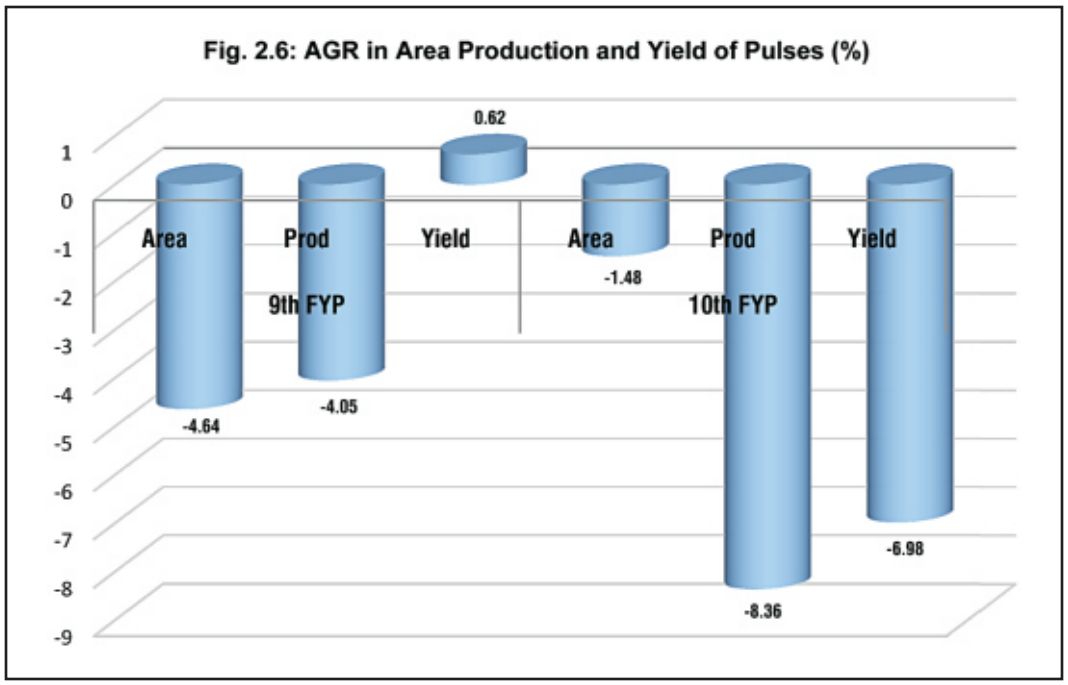
2.3.3 Pulses

No district has been covered under NFSM in the state and hence all the districts, for analysis purpose, have been considered as Non-NFSM districts. The results of analysis have been presented in Table-2.6 indicating that area and production of pulses in the state declined at the rate of 4.64 and 4.05 per cent per annum, respectively during the 9th five year plan. The growth rate of yield during this plan was 0.62 per cent. But during next plan period, rate of decline in area under pulses decreased to -1.48 per cent but growth rate of production further declined to -8.36 per cent. The yield in this period declined at the rate of 6.98 per cent per annum. The data pertaining to area, production and yield was not available for 11th five year plan and hence no analysis could be carried out.

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

Districts	9th FYP			10th FYP			11th FYP		
	Area (%)	Production (%)	Yield (%)	Area (%)	Production (%)	Yield (%)	Area (%)	Production (%)	Yield (%)
NFSM Districts									
No NFSM district									
Non-NFSM Districts									
Bilaspur	-12.13	-22.92	-12.29	-11.99	-8.65	3.80	N.A.	N.A.	N.A.
Chamba	-2.10	-5.05	-3.01	-0.42	5.61	6.05	N.A.	N.A.	N.A.
Hamirpur	-27.58	-29.52	-2.68	-26.60	-22.79	-5.19	N.A.	N.A.	N.A.
Kangra	-6.23	-8.37	-2.28	-5.35	-4.98	0.39	N.A.	N.A.	N.A.
Kinnaur	10.11	3.64	-5.88	4.12	-13.17	-16.61	N.A.	N.A.	N.A.
Kullu	2.82	3.40	0.56	-0.85	30.91	32.02	N.A.	N.A.	N.A.
L&S	7.39	6.46	-0.86	-52.58	-72.88	-41.11	N.A.	N.A.	N.A.
Mandi	-5.80	-16.29	-11.14	4.88	3.07	-1.73	N.A.	N.A.	N.A.
Shimla	-5.79	-9.21	-3.63	2.08	18.84	16.42	N.A.	N.A.	N.A.
Sirmour	-4.85	-5.09	-0.25	-4.55	-8.87	-4.54	N.A.	N.A.	N.A.
Solan	-11.10	-18.59	-8.42	0.50	-4.16	-4.63	N.A.	N.A.	N.A.
Una	-16.22	-21.71	-6.55	-6.16	2.18	8.89	N.A.	N.A.	N.A.
H.P	-4.64	-4.05	0.62	-1.48	-8.36	-6.98	N.A.	N.A.	N.A.

NA-Not Available



2.4 Financial Progress under NFSM

The financial progress has been presented separately for both wheat and rice. The activities under NFSM started in the state during the year 2012-13 only. Thus, the analysis pertaining to previous years, as desired, could not be carried out.

2.4.1 Rice

During the year 2012-13 an amount of Rs.444.06 was released for implementation of NFSM activities under rice crop which amount was increased to Rs.482.75 lacs during the year 2013-14 Table 2.7A. The allocated amount was completely consumed in carrying out the activities resulting in 100 per cent achievement.

2.4.2 Wheat

Under wheat, an amount of Rs.1601.55 was released during the year 2012-13 and an amount of Rs.1632.31 during next year (Table 2.7 B). Like rice, 100 per cent achievement in utilizing the released amount was obtained.

Table 2.7A: Financial Progress for Rice under NFSM in Himachal Pradesh

Year	Amount Released (Rs. in lakhs)	Achievement (Expenditure) (Rs. in lakhs)	Percentage of Achievement
2007-08	PNI	PNI	PNI
2008-09	PNI	PNI	PNI
2009-10	PNI	PNI	PNI
2010-11	PNI	PNI	PNI
2011-12	PNI	PNI	PNI
11th Plan Avg. AGR			
2012-13	444.06	444.06	100.00
2013-14	482.75	482.75	100.00

PNI – Programme not implemented

Table 2.7B: Financial Progress for Wheat under NFSM in Himachal Pradesh

Year	Amount Released (Rs. in lakhs)	Achievement (Expenditure) (Rs. in lakhs)	Percentage of Achievement
2007-08	PNI	PNI	PNI
2008-09	PNI	PNI	PNI
2009-10	PNI	PNI	PNI
2010-11	PNI	PNI	PNI
2011-12	PNI	PNI	PNI
11th Plan Avg. AGR			
2012-13	1601.55	1601.55	100.00
2013-14	1632.31	1632.31	100.00

PNI – Programme not implemented

2.5 District wise Outlays and Expenditure

This analysis also has been carried out separately for rice and wheat for the period of two years of NFSM implementation in the state.

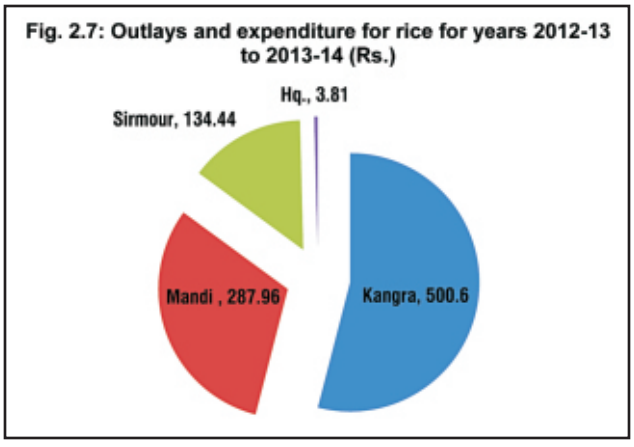
2.5.1 Rice

The NFSM activities under rice have been restricted to three districts viz Kangra, Mandi and Sirmour along with some administrative expenditure at head quarter. It may be seen from Table 2.8 A that highest allocation was made in district Kangra followed by Mandi and Sirmour. This allocation was about 54 per cent in Kangra, about 31 per cent in Mandi and about 15 per cent in district Sirmour. Simultaneously, 0.41 per cent allocation was made for head quarter. Total allocation during these two years was Rs.926.81 which was completely utilized under various components of the programme.

Table 2.8A: District Wise Outlay and Expenditure for Rice for the Year 2012-2013 to 2013-2014 in Himachal Pradesh

Sl. No.	Districts	Outlay (Rs. in lakhs)	Expenditure (Rs. in lakhs)
1	Kangra	500.60 (54.01)	500.60 (54.01)
2	Mandi	287.96 (31.07)	287.96 (31.07)
3	Sirmour	134.44 (14.51)	134.44 (14.51)
4	Headquarters	3.81 (0.41)	3.81 (0.41)
	Total	926.81 (100.00)	926.81 (100.00)

Note: Figures in the parenthesis indicates percentage to the total.



2.5.2 Wheat

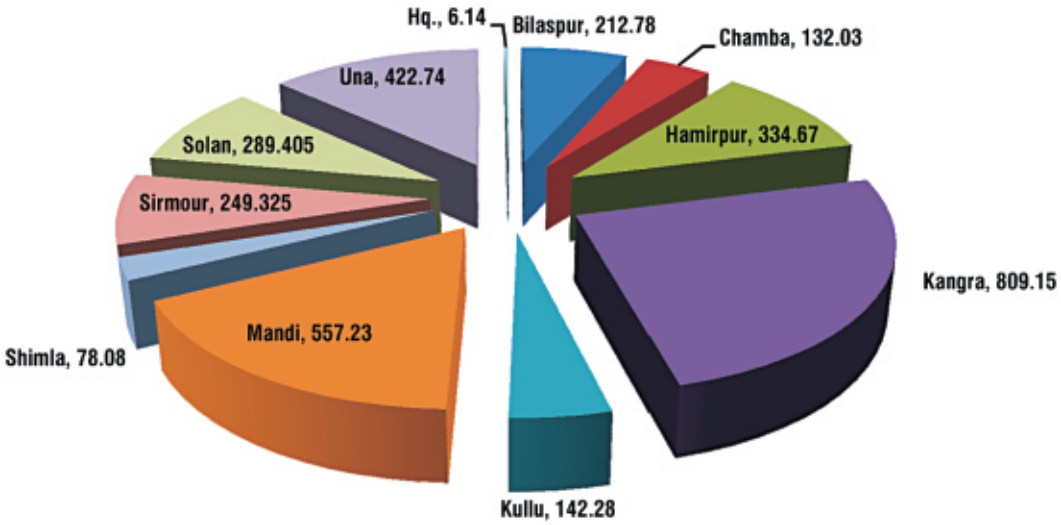
Ten districts of the state, expect for tribal districts of Kinnaur and Lahaul-Spiti have been covered for implementing NFSM activities under wheat crop. For this crop total budget outlay of Rs.3233.86 was made available (Table 2.8 B) which was completely exhausted for programme implementation. In all the districts, the budget allocation and expenditure were exactly the same indicating cent per cent fund utilization in individual districts.

Table 2.8B: District Wise Outlay and Expenditure for Wheat for the Year 2012-2013 to 2013-2014 in Himachal Pradesh

Sl. No.	Districts	Outlay (Rs. in lakhs)	Expenditure (Rs. in lakhs)
1	Bilaspur	212.785 (6.58)	212.785 (6.58)
2	Chamba	132.035 (4.08)	132.035 (4.08)
3	Hamirpur	334.672 (10.35)	334.672 (10.35)
4	Kangra	809.157 (25.02)	809.157 (25.02)
5	Kullu	142.283 (4.40)	142.283 (4.40)
6	Mandi	557.235 (17.23)	557.235 (17.23)
7	Shimla	78.080 (2.41)	78.080 (2.41)
8	Sirmour	249.325 (7.71)	249.325 (7.71)
9	Solan	289.405 (8.95)	289.405 (8.95)
10	Una	422.745 (13.07)	422.745 (13.07)
11	Headquarters	6.140 (0.20)	6.140 (0.20)
	Total	3233.860 (100.00)	3233.860 (100.00)

Note: Figures in the parenthesis indicates percentage to the total.

Fig. 2.8: Outlay and Expenditure for Wheat for the years 2012-13 to 2013-14 (Rs.)



2.6 Intervention Outlays and Expenditure

This analysis has been carried out separately for wheat and rice crops for two years; 2012-13 and 2013-14 combined together.

2.6.1 Rice

The results of category wise analysis of outlays and expenditure for rice, combined together for two years has been presented inTable-2.9A indicating the outlays for resource conservation techniques to be the highest component of total outlay of Rs. 518.25 lacs. About 42.40 per cent of the outlay was for this component only followed by demonstration for improved technologies, 41.97 per cent of the outlay earmarked for this component. Seed distribution and plant and soil protection management had minor allocation of 5.98 and 9.65 per cent respectively.

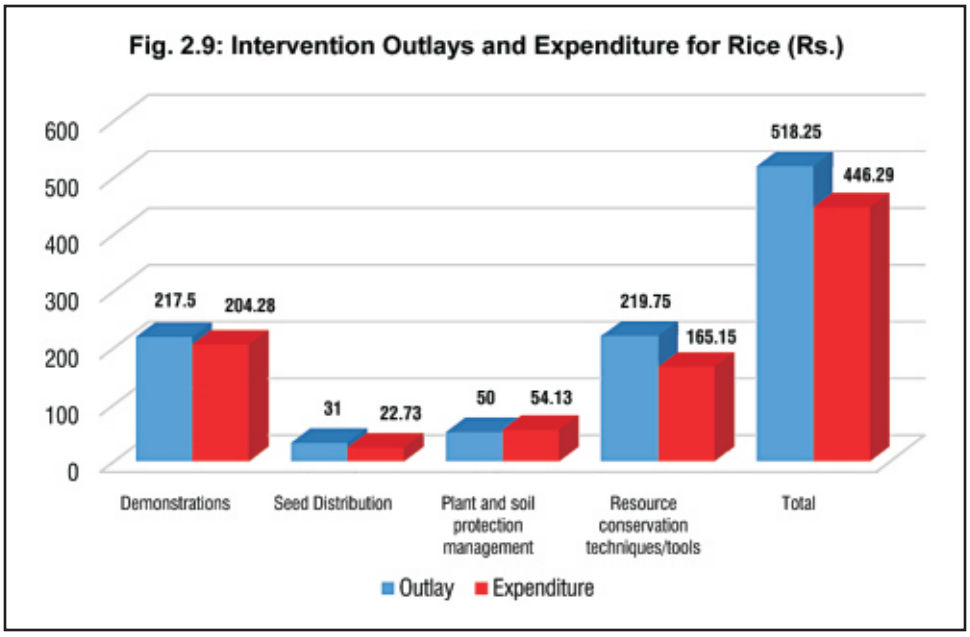
Against the approved outlay of Rs. 518.25 lacs an expenditure of only Rs. 446.29 lacs was made. Out of total expenditure, largest expenditure was made on demonstration for improved technologies, 45.77 per cent followed by resource conservation techniques on which about 37 per cent of the total expenditure was made.

The results indicate that highest achievement was achieved in case of plant and soil protection management, 108.26 per cent. For all other components, achievement was below hundred per cent. At over all level the performance was only about 86 per cent.

Table 2.9A: Category wise Interventions Outlay and Expenditure for Rice for the Year 2012-2013 to 2013-2014 in Himachal Pradesh

Sl. No.	Category wise interventions	Outlay (Rs. in lakhs)	Expenditure (Rs. in lakhs)	Percentage achievement
1	Demonstrations for improved technologies	217.50 (41.97)	204.28 (45.77)	93.92
2	Seed Distribution	31.00 (5.98)	22.73 (5.09)	73.32
3	Plant and soil protection management	50.00 (9.65)	54.13 (12.13)	108.26
4	Resource conservation techniques/tools	219.75 (42.40)	165.15 (37.01)	75.15
	Total	518.25 (100.00)	446.29 (100.00)	86.11

Note: Figures in the parenthesis indicates percentage.



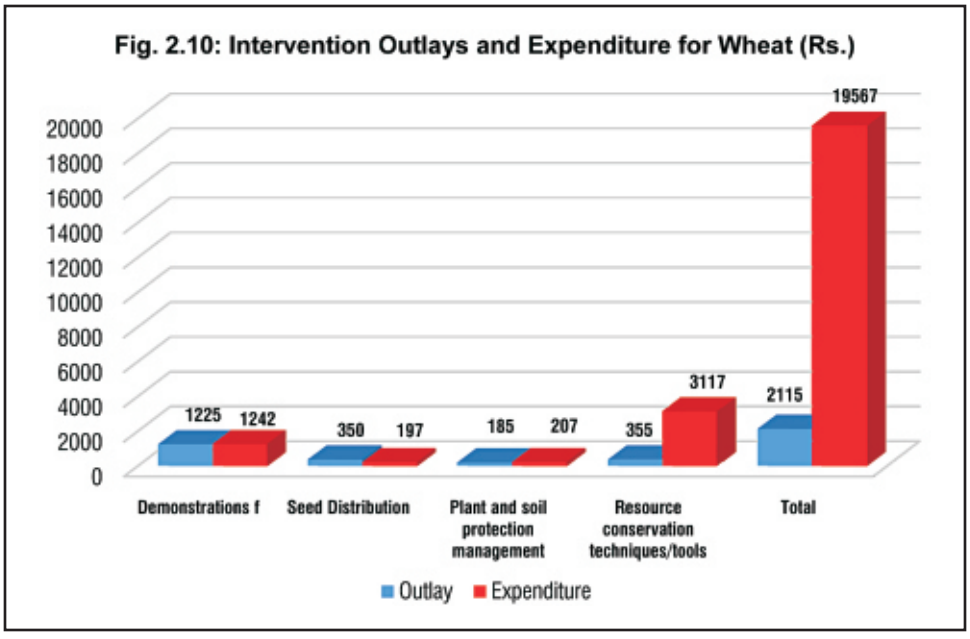
2.6.2 Wheat

For wheat crop total allocation for the two years was Rs. 2114.63 lacs of which largest earmarking was for the demonstrations for improved technologies, about 58 per cent (Table-2.9B). For resource conservation techniques/tools outlays was only 16.77 per cent of the total. As in case of rice, under wheat also, the actual expenditure was Rs. 1956.20 lacs, about 93 per cent of the outlay. The achievement in terms of percentage of expenditure in relation to outlay was more than hundred per cent in case of plant and soil protection management (111.81%) and demonstrations for improved technologies (101.35%). The performance under seed distribution was only about 56 per cent and resource conservation techniques about 88 per cent.

Table 2.9B: Category wise Interventions Outlay and Expenditure for Wheat for the Year 2012-2013 to 2013-2014 in Himachal Pradesh

Sl. No.	Category wise interventions	Outlay (Rs. in lakhs)	Expenditure (Rs. in lakhs)	Percentage achievement
1	Demonstrations for improved technologies	1225.00 (57.93)	1241.55 (63.47)	101.35
2	Seed Distribution	350.00 (16.55)	196.66 (10.05)	56.19
3	Plant and soil protection management	185.00 (8.75)	206.84 (10.57)	111.81
4	Resource conservation techniques/tools	354.63 (16.77)	311.15 (15.91)	87.86
	Total	2114.63 (100.00)	1956.20 (100.00)	92.51

Note: Figures in the parenthesis indicates percentage.



It is important to point out here that the total outlay for the state has been shown as Rs. 926.81 in Table 2.8A when state-wise distribution is presented. But this figure does not reconcile with the total outlay figure of Rs.518.25 when category-wise outlays and expenditure are analysed in Table 2.9A. The department of agriculture could not answer satisfactorily when asked about the reasons for discrepancy and showed their helplessness in absence of any other figures. These were claimed to be provisional figures yet to be reconciled and finalized. Same problem was encountered under wheat also (Tables 2.8A and 2.9B). Thus, there was no other alternative but to use these figures for analysis.

2.7 Correlation between Change in NFSM Expenditure and Irrigation / Fertilizer

This could not be analyzed in the absence of requisite data. However, percentage changes have been presented wherever the data was available, Tables 2.10 and 2.11.

Table 2.10: Correlation between Per Cent Change in NFSM Expenditure and Irrigation / Fertilizer in Himachal Pradesh

Year	% Change Total NFSM Expenditure	% Change of Net Irrigated Area	% Change of Fertilizer
Change over 2006-07	N.A.	-9.95	1.99
Change over 2007-08	N.A.	15.29	14.82
Change over 2008-09	N.A.	-2.11	-7.19
Change over 2009-10	N.A.	N.A.	3.56
Change over 2010-11	N.A.	N.A.	-6.62
Change over 2011-12	N.A.	N.A.	N.A.
Change over 2012-13	N.A.	N.A.	N.A.
Correlation Coefficient	N.A.	N.A.	N.A.

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

Year	% Change Total NFSM Expenditure	% Change of Area	% Change Production
Change over 2006-07	N.A.	N.A.	N.A.
Change over 2007-08	N.A.	N.A.	N.A.
Change over 2008-09	N.A.	N.A.	N.A.
Change over 2009-10	N.A.	N.A.	N.A.
Change over 2010-11	N.A.	N.A.	N.A.
Change over 2011-12	N.A.	N.A.	N.A.
Change over 2012-13	N.A.	N.A.	N.A.
Correlation Coefficient	N.A.	N.A.	N.A.

2.8 Summing up

The analysis indicates that during the 10th five year plan there was an improvement only in net area sown and cropping intensity as indicated by improvement in AAGRs. But for all other indicators, there was definite decline in AAGRs indicating that the situation has worsened. No conclusion could be drawn for 11th five year plan due lack of data. There was improving trend in area under paddy but production and yield of paddy improved during 10th five year plan as compared with 9th but during 11th plan there was definite decline. However, there was decline in AAGR production and yield of wheat during successive plan periods. The AAGR of area under wheat improved during 10th plan but then reverted back to level of 9th plan. There was absence of any definite trend in AAGRs of area, production and yield in case of pluses. The performance of NFSM districts in respect of area, production and yield of paddy was better as compared to Non-NFSM districts as judged by respective growth rates. More or less same picture emerged in case of wheat but trend was not as definite as in case of paddy. There were no NFSM districts in case of pulses and hence no comparison could be made.

The funds made available for paddy and wheat were completely utilized during the two years of the programme in the state. There was no spillover of funds from one district to other as indicated by the outlays and expenditure for each district. But there was mismatch between outlays and expenditure of category-wise interventions for both rice and wheat some components consuming more than their outlays.

CHAPTER 3

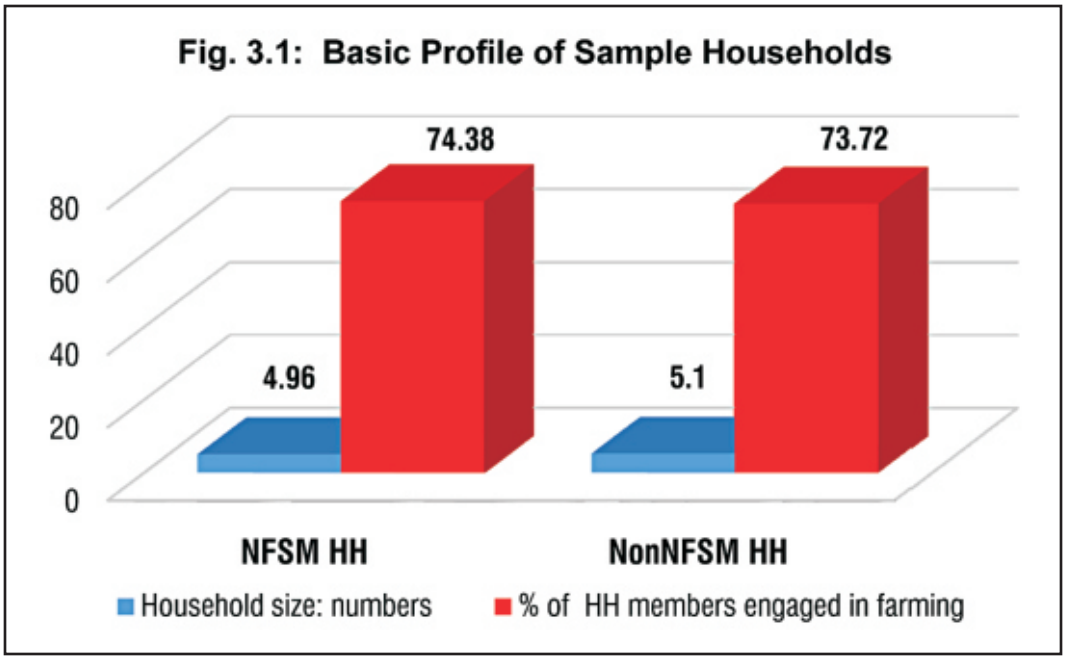
HOUSEHOLD CHARACTERISTICS, CROPPING PATTERN AND PRODUCTION STRUCTURE

The present chapter has been devoted to understand the socio-economic background of the sampled households. This is necessary to evaluate the background under which these households have been operating so that the inferences could be viewed accordingly.

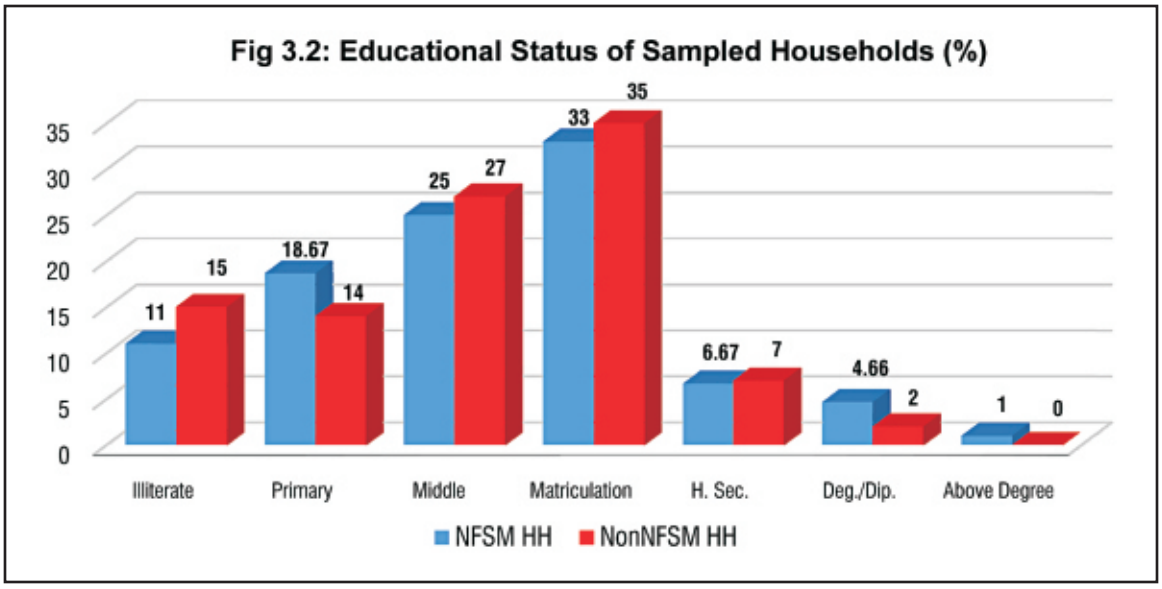
3.1 Socio-economic Profile

The socio-economic profile has been presented in Table 3.1 based on 300 NFSM and 100 NFSM households selected as per methodology detailed in chapter –I. The analysis indicates the household's size to be 4.96 for NFSM households, which was slightly lower than the household size of 5.10 persons in case of Non-NFSM households. The percentage of household members engaged in farming was 74.38 per cent in case of NFSM households and was slightly higher than other category (73.72 %).

Fig. 3.1: Basic Profile of Sample Households

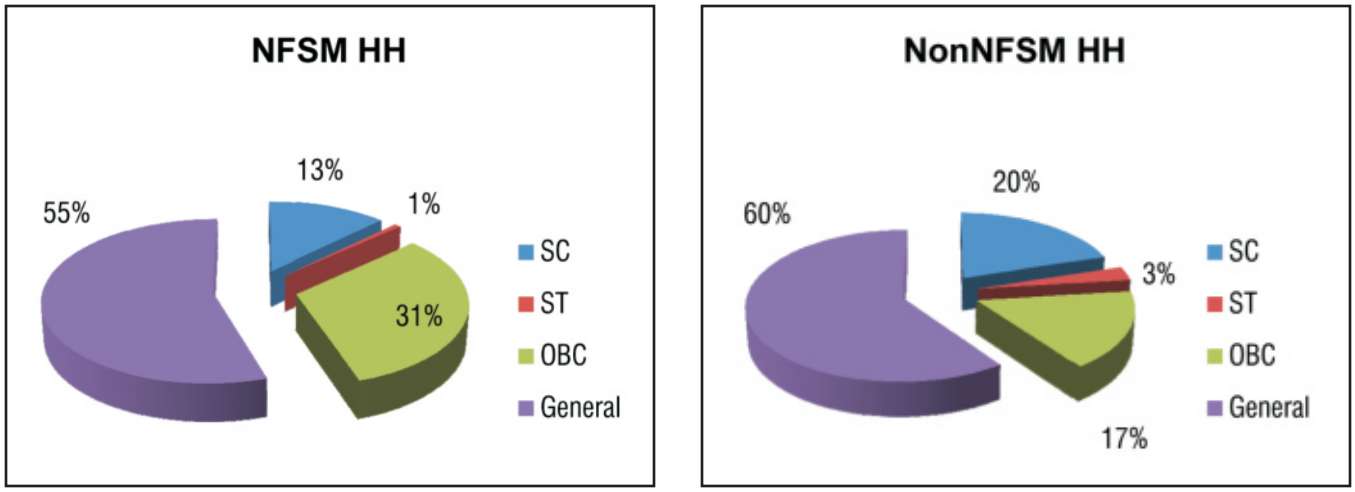


The gender analysis of respondents indicates that in case of NFSM households, 67 per cent respondents were male whereas in case of Non-NFSM households this figure was 84 per cent. It was found that in case of NFSM households about 41 per cent members were adult males, about 37 per cent were adult females and the rest about 22 per cent were children. These figures for Non-NFSM households were about 40, 34 and 26 per cent respectively. The educational status of the family members has been analyzed indicating that about 11 per cent family members were illiterate among NFSM households in comparison to 15 per cent members being illiterate among Non-NFSM households. The percentage of persons who had passed primary level educational standard was about 19 percent among NFSM households whereas only 14 percent of Non-NFSM household family members had attained this level. The percentage of persons who had education levels of middle, matriculation and higher secondary was slightly higher in case of Non-NFSM households whereas the percentage of persons who had obtained degree/diploma or had education level above the graduation was higher in case of NFSM households.



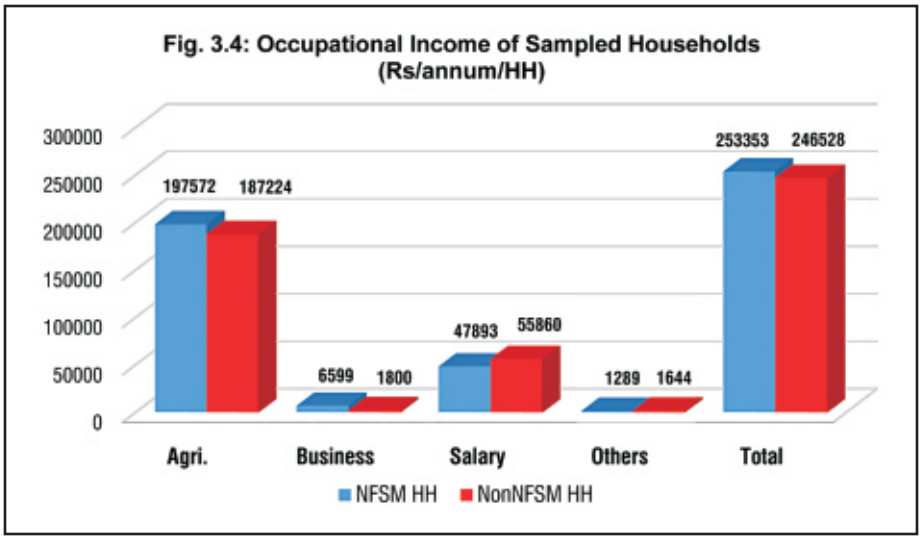
The benefits available under various development schemes are also determined by the caste profile of the households. Thus, the analysis also included the caste structure of the selected households under both categories. It was found that about 13 percent of NFSM households and 20 percent of Non-NFSM households belonged to scheduled caste category whereas these figures for households belonging to schedule tribe category were 0.67 and 3.0 per cent respectively. Among the sample about 32 and 17 percent families belonged to other backward classes in case of NFSM and Non-NFSM households respectively. The remaining 55 and 60 per cent households respectively, belonged to general category.

Fig. 3.3: Caste Profile of Sample

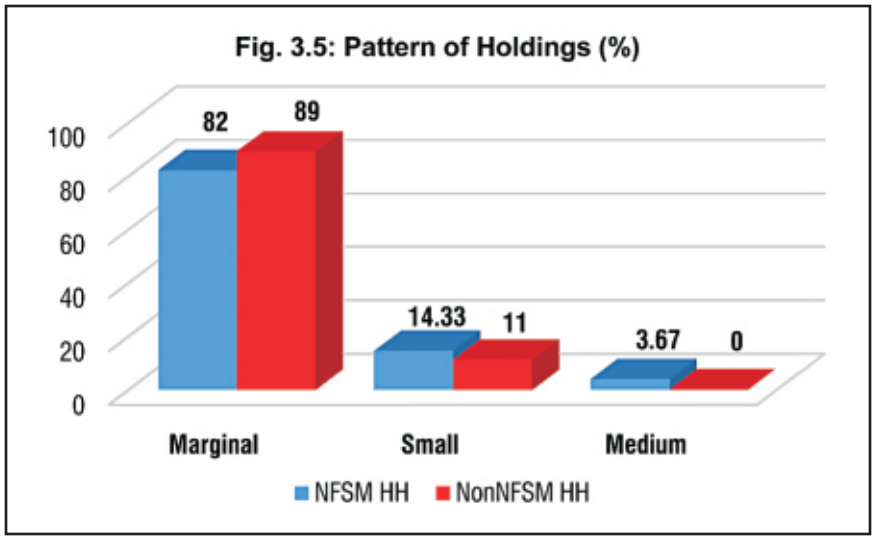


The selected households were found to be obtaining income from various sources like agriculture, business and salary etc. It was found that the NFSM households were generating about eleven per cent higher income as compared to control sample. The average annual household income of NFSM households was found to be Rs. 253353 whereas the Non-NFSM households were generating an income of Rs. 226648 only. However, agriculture was the main source of household income and each household on an average was getting an income of Rs.197572 per annum in case of

NFSM households which was higher than an income of Rs.187224 per households per annum in case of Non-NFSM households. The NFSM households were also deriving an income of Rs. 6599 per households per year from own business which figure was only Rs.1800 in case of Non-NFSM households. But the level of income from salaries/pension was higher at Rs.55860 per households per annum in case of Non-NFSM households whereas the NFSM households were getting an average income of Rs.47893 per year. None of the selected households were getting any income as wages.

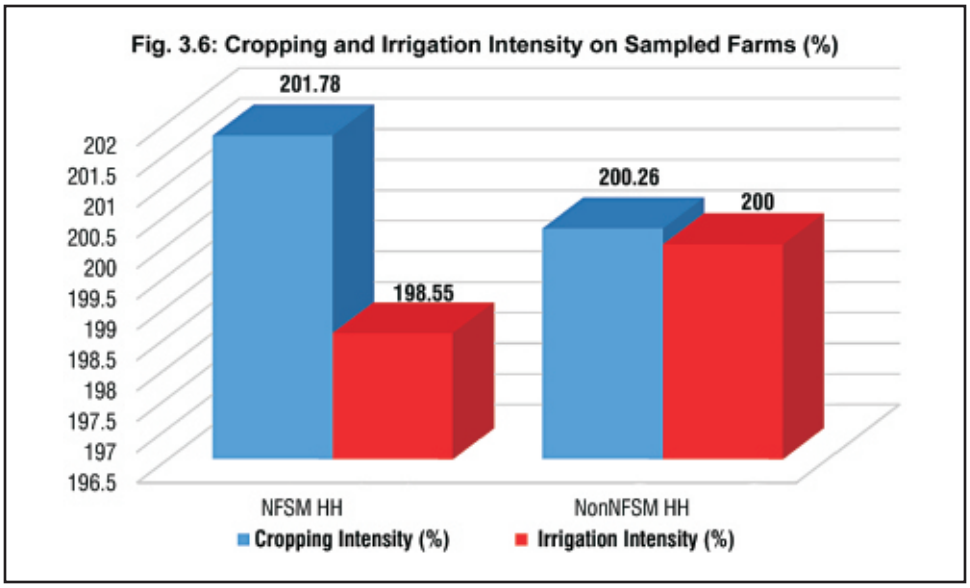


The analysis of net operated area indicated that among the NFSM households, of the total area, about 66 per cent are belonged to marginal category, about 23 per cent to small and about 11 per cent to medium category. In case of Non-NFSM households about 81 per cent of the total area was under marginal and remaining about 19 per cent under small holdings, no area was under medium or large category. This analysis was further extended to find out the categories of holdings and it was found that for NFSM category about 82 per cent holdings were marginal, about 14 per cent small and about 4 per cent medium, no holdings being under large category. In comparison to this, 89 per cent of the holdings belonging to Non-NFSM households were marginal and 11 per cent were small holdings. None of the holdings belonging to Non-NFSM households could be categorized as medium or large holdings. The average size of holdings was larger, 1.28 acres in case of NFSM households whereas for Non-NFSM households, average size of holdings was 1.01 acres.



3.2 Characteristics of Operational Holdings

The selected households under NFSM had larger land holdings. The average size of owned land with NFSM households was 1.72 acres which figure for Non-NFSM category was about only 1.39 acres. Off this about 0.44 and 0.38 acres respectively were under uncultivated/fallow land. Hence, the own cultivated land was about 1.28 and 1.01 acres respectively. None of the households under both categories had leased-in or leased-out land. Hence, the net operated area was the same as own cultivated land under both the categories, Table 3.2 presents the details. It is also found that the cropping intensity on farms belonging to NFSM households was 201.78 per cent, marginally higher than the cropping intensity of 200.26 per cent on Non-NFSM household farms. The scenario of irrigation intensity was just reverse and it was 198.55 per cent on NFSM household farms, marginally lower than the irrigation intensity of 200 per cent on Non-NFSM household's farms. The analysis indicated that the total owned land per households among NFSM households was 1.72 acres with net operated area of 1.28 acres. These figures for Non-NFSM households were 1.39 and 1.01 acres respectively.



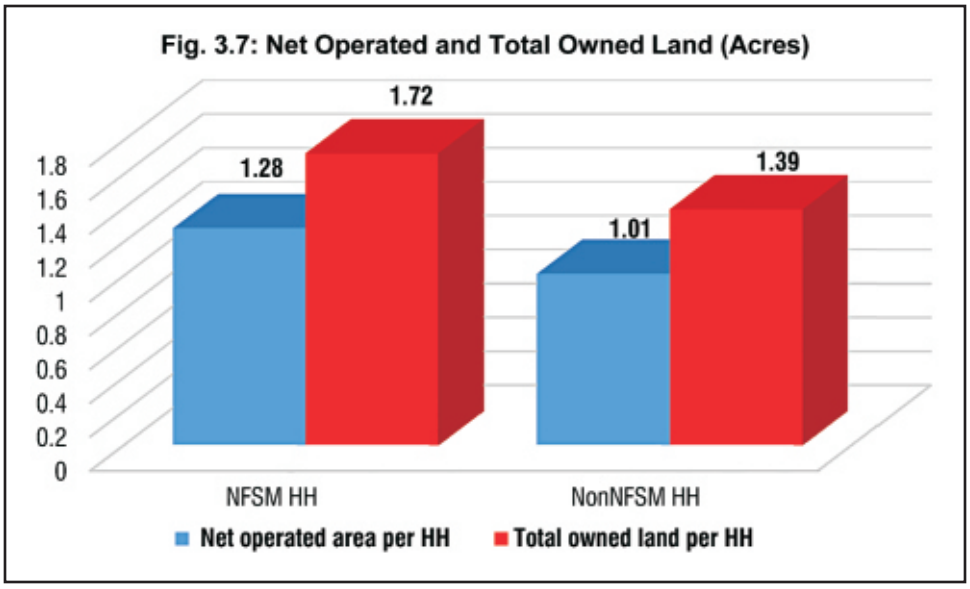


Table 3.1: Socio-economic Profile of the Sample Households

(% of HH)

Characteristics			NFSM	Non-NFSM
Total households surveyed: numbers			300	100
Household size: numbers			4.96	5.10
% of HH members engaged in farming			74.38	73.72
Gender of the Respondent (%)		Male	67.00	84.00
		Female	33.00	16.00
Age group of the members (%)		Adult Males (>15 yrs)	41.16	40.39
		Adult Females (>15 yrs)	37.19	33.73
		Children (<15 yrs)	21.65	25.88
Education status of the family members (%)		Illiterate	11.00	15.00
		Primary	18.67	14.00
		Middle	25.00	27.00
		Matriculation/secondary	33.00	35.00
		Higher secondary	6.67	7.00
		Degree/Diploma	4.66	2.00
		Above Degree	1.00	0.00
Caste of households (%)		SC	12.67	20.00
		ST	0.67	3.00
		OBC	31.66	17.00
		General	55.00	60.00
Occupation income (Rs./annum/HH)		Only agriculture	197572	187224
		Own business	6599	1800
		Salaried/pensioners	47893	55860
		Wage earners	0	0
		Others*	1289	1644
		Average annual income from all sources	253353	246528
Net operated area	% of area	Marginal (0.1 to 2.5 ac)	65.63	81.19
		Small (2.51 to 5 ac)	23.11	18.81
		Medium (5.1 to 10 ac)	11.26	0.00
		Large (10.1 and above)	0.00	0.00
	% of holdings	Marginal (0.1 to 2.5 ac)	82.00	89.00
		Small (2.51 to 5 ac)	14.33	11.00
		Medium (5.1 to 10 ac)	3.67	0.00
		Large (10.1 and above)	0.00	0.00
	Average size	Total (acres)	1.28	1.01

*Income from others is solely form from dairy farming.

Table 3.2: Characteristics of Operational Holdings of Sample Households

(Acres per HH)

Land details	NFSM	Non-NFSM
1. Total owned land	1.72	1.39
2. Un-cultivated land/Fallow land	0.44	0.38
3. Cultivated land (Own)	1.28	1.01
4. Leased-in land	0	0
5. Leased-out land	0	0
6. Net Operated Area(3+4)	1.28	1.01
7. Cropping Intensity (%)	201.78	200.26
8. Irrigation Intensity (%)	198.55	200.00
9. Net operated area per HH	1.28	1.01
10. Total owned land per HH	1.72	1.39

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

3.3 Sources of Irrigation

None of the households under both categories were using canal or tube well irrigation, the main source of irrigation being small water channels (kuhls). About 31 per cent of the land was being irrigated through this source on farms belonging to NFSM households whereas about 28 per cent land was being irrigated through this source on the farms of Non-NFSM households, Table 3.3 has details. As such about 69 and 72 per cent of the total area was completely rain fed in respect of NFSM and Non-NFSM farms respectively. The total irrigated area was 0.54 acres on NFSM households farms and 1.18 acres were rain fed, both figures higher than respective 0.39 and 0.99 acres in case of Non-NFSM households farms.

Table 3.3: Distribution of Area by Source of Irrigation

(% to the total area)

Land details	NFSM	Non-NFSM
Only Canal	0	0
Only tube well (Electric/diesel)	0	0
Canal+ tube well (Electric/diesel)	0	0
Tank and others (Open well)Kuhl	31.47	28.17
Rain fed area	68.53	71.83
Total irrigated area per hh (acres)	0.54	0.39
Total rain fed area per hh (acres)	1.18	0.99

*Figures in the parenthesis indicates percentage to the total.

3.4 Nature of Tenancy

The practice of leasing-in or leasing out of land on whatever terms was found to be completely absent under both the categories of farms (Table 3.4).

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

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

Terms of leasing	NFSM		Non-NFSM	
	Leasing-in	Leasing-out	Leasing-in	Leasing-out
Share cropping	0	0	0	0
Fixed rent in cash	0	0	0	0
Fixed rent in kind	0	0	0	0
Both (cash and kind)	0	0	0	0
Against labour	0	0	0	0
Others	0	0	0	0
Aggregate	0	0	0	0

3.5 Cropping Pattern

The cropping pattern of sampled NFSM and Non-NFSM household farms has been presented in Table 3.5 wherein it may be seen that among cereals, wheat is the main crop followed by paddy and maize. The NFSM households were devoting about 38 per cent of the gross cropped area for wheat, about 19 per cent for paddy and about 15 per cent for maize. They also cultivated barley on about 7 per cent of the gross cropped area and only 0.86 per cent was devoted for other minor cereals. On the other hand the Non-NFSM households cultivated wheat on about 38 per cent, paddy on about 21 percent, maize on about 13 per cent and barley on about 6 per cent of the gross cropped area. The gross cropped area devoted from gram was 0.12 per cent and 4.83 per cent was put under other pulses by NFSM households. The Non-NFSM households were cultivating only other pulses on about 7 per cent of the gross cropped area. Oil seeds were cultivated only by NFSM households who had put 0.09 per cent of gross cropped area under rape and mustered.

Fruits were other major crop being cultivated on 9.70 and 11.83 per cent of the gross cropped area by NFSM and Non-NFSM households. The NFSM households had devoted about 9.55 per cent GCA for apple cultivation and 0.15 for mangoes. But in case of Non-NFSM households only apple constituted fruit crops. They were also cultivating vegetables on 3.91 and 2.58 per cent of gross cropped area respectively. Beans was the most important vegetable grown occupying 0.86 per cent of GCS on NFSM households and 1.20 per cent on Non-NFSM households. Almost same area was allocated for cultivation of peas by NFSM households but in case of Non-NFSM households it was only 0.60 per cent of GCA. Cabbage, tomato, capsicum, brinjal and potato were other vegetable crops being cultivated by both categories of households. In addition to this 1.06 per cent of the gross cropped area was devoted for fodder cultivation by NFSM households whereas Non-NFSM households had put only 0.06 per cent area for cultivation of fodder.

The analysis indicates that there are no significant differences between the cropping pattern of both categories of households except for the fact that Non-NFSM households were not cultivating gram and oil seeds.

Table 3.5: Cropping Pattern of Sample Households

(% of Gross Cropped Area)

Name of the Crop	NFSM	Non-NFSM
Cereals		
Paddy	18.85	21.23
Wheat	38.03	38.40
Maize	15.24	13.22
Barley	7.31	5.74
Jowar	-	-
Bajra	-	-
Ragi	-	-
Minor Cereals	0.86	0
Pulses		
Tur	-	-
Gram	0.12	0
Other pulses	4.83	6.96
Oilseeds		
Groundnut	-	-
Sunflower	-	-
Soybean	-	-
Rape & Mustard	0.09	0
Other Oilseeds	-	-
Fruit		
Apple	9.55	11.83
Mango	0.15	0.00
Vegetables		
Beans	0.86	1.20
Peas	0.83	0.60
Cabbage	0.59	0.00
Tomato	0.57	0.11
Capsicum	0.51	0.45
Brinjal	0.34	0.11
Potato	0.21	0.11
Others		
Cotton	-	-
Jute & Mesta	-	-
Sugarcane	-	-
Flowers	-	-
Spices	-	-
Plantation	-	-
Fodder	1.06	0.06
Forest species	-	-
Others	-	-

3.6 Household Income

The total household income of the sample has been presented in Table 3.6 (a) wherein it is seen that the total per household income of both NFSM and Non-NFSM households was almost identical at about Rs. 2.07 lacs with higher net farm income of Rs. 152189 in case of NFSM households. The Non-NFSM households were deriving net farm income of Rs. 148018 per household. The annual per acre average income of NFSF households was Rs. 178845 and for Non-NFSM households it was much higher and was about Rs.2.17 lacs. The value of output was also higher for Non-NFSM households, Rs. 194418 per acre in comparison to Rs. 161690 per acre in case of NFSM households. In fact all the value of all the parameters was higher for Non-NFSM households. In case of NFSM households about 74 per cent of the total income is derived from farming activities and the rest about 26 per cent from non-farm activities. In comparison the Non-NFSM households had about 71 per cent of the income as farm income and rest 29 per cent as non-farm income. It is also interesting to note that whereas per household income of both categories is almost identical, the per acre income in case of NFSM households was lower due higher net operated area.

Thus, it may be concluded that the NFSM households are better off on the consideration of household income but on per acre basis, Non-NFSM households are better off having better farm economics.

Table 3.6 (a): Household income from agricultural and non-agricultural sources

Costs and returns particulars	NFSM		Non-NFSM	
	Rs. per household	Rs. per acre	Rs. per household	Rs. per acre
Value of output (main + by-product)	197572	161970	188480	194418
Cost of production	45383	28856	40462	38809
Net returns (Farm business income)	152189	133115	148018	155608
Non-farm income	55781	45730	59304	61583
Total income	207970	178845	207322	217191

3.7 Cost and Returns from Crop Cultivation

The costs of cultivation and returns from cultivation of individual crops have been presented in Table 3.6 (b). It is found that the yield of paddy was higher at 19.02 qtls per acre in case of Non-NFSM households whereas the NFSM households were getting a yield of 16.76 qtls per acre. The gross returns were higher in case of Non-NFSM households whereas their cost of cultivation was lower. This resulted in higher net returns of Rs.31476 per acre in case of Non-NFSM households whereas the NFSM households could get a net return of only Rs.26458 per acre. This scenario was completely reverse in case of wheat where the NFSM households were getting a net returns of Rs.19340 and Non-NFSM category had to contend with a net return of only Rs.17392 per acre. This has been possible due to higher gross returns and lower cost of cultivation of wheat on NFSM household farms. The net returns in case of barley were Rs. 3191 per acre in case of Non-NFSM households whereas on NFSM household farms, cultivation of barley resulted in a loss of Rs. 922 per acre. Similarly, in case of maize the net returns on NFSM household farms were Rs.4871 whereas the Non-NFSM household farms just broke even with a marginal net return of Rs.43 per acre. The cultivation of minor cereals was a loss making preposition as the NFSM households were making a loss of Rs.3142 per acre by its cultivation. May be due to this reason the Non-NFSM households were not cultivating such cereals.

Table 3.6 (b): Crop wise Costs and Returns among the Sample Households

Name of the Crop	NFSM				Non-NFSM			
	Yield (Qtls/ acre)	Gross returns (Rs. / acre)	Cost of cultivation (Rs. / acre)	Net Returns (Rs. / acre)	Yield (Qtls/ acre)	Gross returns (Rs. / acre)	Cost of Cultivation (Rs. / acre)	Net Returns (Rs. / acre)
Cereals								
Paddy	16.76	47751	23093	26458	19.02	54197	22721	31476
Wheat	11.92	34209	14869	19340	11.49	33009	15617	17392
Barley	7.37	20706	17515	3191	5.78	16876	17798	-922
Jowar	-	-	-	-	-	-	-	-
Bajra	-	-	-	-	-	-	-	-
Maize	8.78	24150	19279	4871	6.84	18745	18702	43
Ragi	-	-	-	-	-	-	-	-
Minor Cereals	5.45	15806	18948	-3142	0	0	0	0
Pulses								
Tur	-	-	-	-	-	-	-	-
Gram	1.87	9187	22500	-13313	0	0	0	0
Other pulses	3.10	24468	23030	1438	3.32	26109	22883	3226
Oilseeds								
Groundnut	-	-	-	-	-	-	-	-
Sunflower	-	-	-	-	-	-	-	-
Soybean	-	-	-	-	-	-	-	-
Rape & Mustard	5.00	19500	15667	3833	0	0	0	0
Other Oilseeds	-	-	-	-	-	-	-	-
Others								
Cotton	-	-	-	-	-	-	-	-
Jute & Mesta	-	-	-	-	-	-	-	-
Sugarcane	-	-	-	-	-	-	-	-
Fruits	99.60	571875	41112	530763	113.28	645037	40588	604448
Vegetables	62.13	97449	42034	55415	62.95	109795	37500	72295
Flowers	-	-	-	-	-	-	-	-
Spices	-	-	-	-	-	-	-	-
Plantation	-	-	-	-	-	-	-	-
Fodder	163.80	33032	18197	14835	200.00	40000	17000	23000
Forest species	-	-	-	-	-	-	-	-
Others	-	-	-	-	-	-	-	-

In case of pulses, the NFSM households were cultivating gram and other pulses only. The cultivation of gram was a loss making preposition as NFSM households were making a loss of Rs.13313 per acre. The net returns from other pulses were positive at Rs.1438 and Rs.3226 per acre for NFSM and Non-NFSM households respectively. It was observed that cultivation of pulses is mainly for self consumption rather than for sale in the market.

Rape and mustered were the only oil seed crops grown and that to only by the NFSM households. They were getting a net return of Rs.3833 per acre from oil seed cultivation.

Fruits, vegetables and fodder were other crops being cultivating by sampled households. The analysis indicated that the fruit cultivation was more profitable for Non-NFSM households with a net return of Rs.604448 in comparison to net return of only Rs.530763 in case of NFSM households. The NFSM households also had lower yield and gross returns whereas their cost of cultivation of fruit was marginally higher. The yield rates of vegetables were almost identical for both the categories but despite that the net returns on Non-NFSM household farms were higher at Rs.72295 per acre whereas the NFSM households could get an income of only Rs.55415 per acre. It is therefore, clear that the NFSM households were inefficient in cultivation of fruit and vegetables. This is indicated by the fact that they invariably had lower yield rates despite higher cost of cultivation. The scenario in the cultivation of fodder was also similar with yield and net returns being higher in case of Non-NFSM households.

This analysis indicates absence of any definite trend in any of the variables under consideration and no definite trend emerges for either yield rates or gross and net returns of crops studied.

3.8 Farm Assets

The modern methods of cultivation have inherent reliance on modern and improved farm assets in the form of machinery. However, due to mountainous and rugged topography the use of such modern and heavy equipment is quite limited in the state of Himachal Pradesh. It is because of this reason that the ownership of such machinery and equipment is very minimal. It may be seen that among all the land development, tillage and seed bed preparation equipments, the sample farmers have only tractors and weeders. Only two households among NFSM and four among Non-NFSM households owned these. The value of these was Rs.290000 and Rs.160000 per household for NFSM and Non-NFSM households respectively, if average is taken from number of owning households. For all sample, the value of these assets was Rs.1933 and Rs. 6400 per household for NFSM and Non-NFSM households respectively, Table 3.7. None of the sample farmers owned any sowing and planting equipments. The only plant protection equipments were in the form of sprayers whose value per household was Rs. 2331 and Rs. 3410 per household for NFSM and Non-NFSM categories respectively. If only owning households are taken in to account (143 and 63 household of NFSM and Non-NFSM category) the value of these averaged at Rs.4890 and 5413 indicating the Non-NFSM households were slightly better equipped in this respect. Under the category of harvesting and threshing equipments, only threshers were present. The average value of these was Rs. 2340 and Rs. 1350 per household for NFSM and Non-NFSM category. It was found that 29 and 7 NFSM and Non-NFSM owned this asset and on this basis, the NFSM households on an average owned Rs.24207 worth of threshers which figure for Non-NFSM households was only Rs.19286. The equipments for residue management were also completely absent. Choppers were present on some of the sampled farms and value of these on each NFSM household was Rs.5566 (90 owners) only. The average value of these on each Non-NFSM households was Rs.7620 only (25 owners). Overall these values averaged at Rs. 1670 for NSFM and Rs. 1905 for Non-NFSM households. In addition to these farm equipments and machinery the sampled households also owned cattle shed (296 and 99 households respectively) and one rice/flour mills by each category. The total value of these farm machinery and equipment etc. averaged at Rs.64763 for NFSM household and only Rs.74405 for Non-NFSM households indicating the higher prevalence of modern machinery and equipments on NFSM households.

Table 3.7: Farm Assets Holding by Sample Households

(Rs. /HH)

Equipment code	Implements	NFSM	Non-NFSM
		Value (Rs.)	Value (Rs.)
Land development, tillage and seed bed preparation equipments (1 to 7)			
1	Tractor/mini tractor	1933	6400
2	Rotavator	0	0
3	Tiller	0	0
4	Cultivators	0	0
5	Ploughs	0	0
6	Harrow	0	0
7	Others	0	0
Sowing and Planting equipments (8 to 13)			
8	Seed drill	0	0
9	Drum seeder	0	0
10	Transplantor	0	0
11	Furrow opener	0	0
12	Seed cum fertilizer drill	0	0
13	Others	0	0
Plant protection equipments (14 & 15)			
14	Sprayers	2331	3410
15	Other Plant protection equipments	0	0
Harvesting and threshing equipments (16 to 20)			
16	Cutters	0	0
17	Harvesters	0	0
18	Thresher	2340	1350
19	Leveller blade	0	0
20	Others	0	0
Equipments for residue management (21 to 23)			
21	Brush cutter	0	0
22	crusher	0	0
23	Others	0	0
Post harvest and agro-processing machines (24 & 25)			
24	Chopper	1670	1905
25	Others	0	0
Water lifting implements (26 to 28)			
26	Pump set	10	0
27	Sprinkler	0	0
28	Others	0	0
Others			
29	Others - Farm House(Cattle Shed)	56343	61140
	-Rice /Flour mill	133	200
Grand Total		64763	74405

3.9 Indebtedness

The extent of indebtedness was quite low among the sampled farmers with only 5.67 per cent of the sampled NFSM households having average outstanding credit of Rs.192647 taken from the commercial banks. The respective figures for Non-NFSM households were 5.00 per cent and Rs.130000 only, Table 3.8. The average figures for all sample of both categories were Rs. 10917 and Rs. 6500 respectively. None of the households had taken any loans from agricultural credit societies or other government agencies. The informal credit was also completely absent for both categories.

Investment in agriculture or meeting out the operational expenditure was the sole purpose of taking credit and all the credit has been utilized for this purpose only, Table 3.9. It is heartening to note that there is absolutely no leakage of credit for unproductive purposes.

Table 3.8: Details of Source of Credit by the Sample Households

Source of credit	NFSM		Non-NFSM	
	No. of HH of the total in %	Outstanding amount (Rs/hh)	No. of HH of the total in %	Outstanding amount (Rs/hh)
Commercial Banks	5.67	10917	5.00	6500
PACS	-	-	-	-
Government Agency	-	-	-	-
Intermediaries/Informal				
1	-	-	-	-

Table 3.9: Details of Purpose of Credit by the Sample Households

(Rs. /HH)

Purposes	Purpose of credit	NFSM	Non-NFSM
		Rs. per HH	Rs. per HH
Productive uses	Agriculture	11333	7000
	Animal Husbandry	-	-
	Others	-	-
	Total	11333	7000
Non productive uses	Daily consumption	-	-
	Social	-	-
	Others	-	-
	Total	-	-

3.10 Summing up

The analysis indicates that the average household size was slightly higher in case of Non-NFSM category. The percentage of persons engaged in farming was higher among NFSM households. The percentages of adult males and females were higher for NFSM households whereas children formed higher percentage among Non-NFSM category. Illiterates formed higher proportion of Non-NFSM category but NFSM category had higher percentage of persons who had degree/diploma or qualification above degree level. The NFSM category had higher percentage of SC/ST and OBC households. The NFSM category households also enjoyed higher average annual income from all sources. Larger area of Non-NFSM category farms was under marginal but when holdings were analysed larger percentage of NFSM farms were under marginal category. The total average area operated was also higher for NFSM category farms and same was the case for total owned land. Cropping intensity was marginally higher on NFSM farms but case was just reverse in case of irrigation intensity. Tanks and open field channels were the only source of irrigation and the scenario of irrigation was slightly better on NFSM farms. The practice of leasing-in or out of the land was completely absent in both the categories of sampled farms.

Paddy, wheat and maize were main cereal crops on both categories of farms. Minor cereals and grams were grown only on NFSM farms and other pulses only on Non-NFSM farms. The Non-NFSM farms preferred cultivation of fruit, as indicated by the area devoted for their cultivation whereas the vegetables were preferred crops on NFSM farms.

It was found that the 'per household' agricultural income for NFSM category was higher but this income on 'per acre' basis was lower. Same was the case for total household income. Paddy, wheat and maize, the main cereal crops, were yielding positive returns in both cases but net returns from barley were negative on Non-NFSM farms. The cultivation of gram resulted in loss for NFSM farmers and net returns from other pulses were positive for both categories. The cultivation of fruit and vegetables yielded significant income for farmers, per acre returns being higher for Non-NFSM farmers.

The farm asset holding was quite meagre with almost absence of heavy machinery and equipments. This has been a result of poor economic standing of the farmers and the fact that these machinery and equipments are not compatible with hilly terrain of the state. The condition of indebtedness is not at all alarming with about five per cent of the household under debt from commercial banks taken for agriculture and utilized for the same purpose without any leakage for unproductive purposes.

CHAPTER 4

NFSM INTERVENTIONS AND ITS IMPACT ON FARMING

In Himachal Pradesh, the activities under NFSM started only recently. Only two years have elapsed since the department of agriculture started distributing the seed minikits to beneficiary farmers which activity started during the year 2012-13. Other activity is that of demonstrations/trainings but farmers had no knowledge about the programme under which the demonstrations/trainings were being organized. As such the impact of this component is very difficult to segregate and respondents were not able to answer any question regarding its usefulness or efficacy. In district Kangra, some of the farmers were also provided the pesticides, but the quantity was reported to be so small that, according to them it did not had any impact on cost of cultivation or the wheat productivity. No other activities have been taken up by the department under the programme. Hence, the following analysis, aimed at quantifying the programme impact, has to be viewed in this light.

4.1 Awareness of NFSM

All the beneficiaries were aware of NFSM programme, Table 4.1(a), but they were not aware about components other than seed distribution. The higher level of awareness has been possible due to efforts of department of agriculture, which had provided this information through various camps organized for purposes other than NFSM as well. It appears that the information provided was restricted only about the programme and relevant details have been omitted as the sampled farmers were not aware of other programme details and its other components. The main and only source of information about NFSM was the department of agriculture, Table-4.1(b).

Table 4.1(a): Awareness of NFSM among the Sample Beneficiaries

Details of awareness	Percentage
% of beneficiaries aware about the NFSM	100.00
% of beneficiaries not aware about the NFSM	0
% of beneficiaries who did not reply	0

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

Sl. No.	Sources of Awareness	% of beneficiaries aware about NFSM
1	Newspaper	0
2	Agriculture Dept	100.00
3	State Agricultural Universities	0
4	Krishi Vignana Kendra	0
5	Raitha Samparka Kendra	0
6	Farmers/Friends	0
7	Input Suppliers	0
8	Agri Exhibitions	0
9	ZP/TP/GP	0
10	Others	0
11	Total	100.00

4.2 Benefits availed

As mentioned earlier the only activity undertaken under this programme has been the seed minikits of high yielding/hybrid varieties of wheat. All the beneficiaries of this programme received wheat minikits only. The average cost of these minikits was Rs.1194 per kit excluding the subsidy available at the rate of about 65 per cent (Table 4.2). It was reported that the norm adopted for this distribution was a minikits of 40 kg seeds per acre of land holding. However, there were wide variations and hence the norm of distribution was not strictly adhered. No other equipment or benefit was available for the beneficiary farmers at the time of field survey.

Table 4.2: Particulars of benefit availed (2012-13 up to 2013-14)

Sl. No.	Benefit Item Name	No. of HHs benefitted to aggregate beneficiaries	Avg. total cost (Rs. per HH benefited)	Subsidy as a % of total cost
1	Production of seeds- Certified seed	-	-	-
2	Seed minikits of high yielding varieties/hybrid Wheat	300	1194	64.68
3	Incentive for micro nutrients (in deficit soils)	-	-	-
4	Incentive for lime in acid soils	-	-	-
5	Machineries/Tools	-	-	-
6	Cono weeder	-	-	-
7	Zero till seed drills	-	-	-
8	Multi-crop planters	-	-	-
9	Seed drills	-	-	-
10	Rotavators	-	-	-
11	Pump sets	-	-	-
12	Power weeder	-	-	-
13	Knap Sack Sprayers (Manual and Power Operated)	-	-	-
14	Sprinkler	-	-	-
15	Plant protection chemicals	-	-	-
16	Integrated Nutrient Management	-	-	-
17	Integrated Pest Management	-	-	-
18	Training	-	-	-
19	Others	-	-	-
	Total	300	1194	64.68

4.3 Usage of Farm Equipment

No farm equipment has been made available under the NFSM programme so far and hence there is no question of using the farm equipments (Table 4.3).

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

Sl. No.	Name of the implement	No. of days used per benefited HH	Area covered per benefited HH (acres)	Imputed value own use (Rs/ benefitted HH)	Rented value (Rs/ benefitted HH)
1	NA	NA	NA	NA	NA
2	NA	NA	NA	NA	NA
3	NA	NA	NA	NA	NA
4	NA	NA	NA	NA	NA
5	NA	NA	NA	NA	NA
	Total	NA	NA	NA	NA

*Use one man-day=8 hrs for estimating No. of days used per implement per annum
NA- Not Applicable

4.4 Benefits derived from Farm Equipment

As mentioned earlier no farm equipment has been provided under the programme so the question of emerging benefits does not arise (Table 4.4).

Table 4.4: Benefits derived from Farm Equipments

(% of benefitted HH)

Sl. No.	Benefit derived/Name of the implement	Name of the implement*	Name of the implement*	Name of the implement*	Name of the implement*
1	Solved labour shortage	NA	NA	NA	NA
2	Timely operations	NA	NA	NA	NA
3	Saved water	NA	NA	NA	NA
4	Weed control	NA	NA	NA	NA
5	Good plant growth	NA	NA	NA	NA
6	Reduced drudgery	NA	NA	NA	NA
7	Helped in transportation	NA	NA	NA	NA
8	Reduced cost of cultivation	NA	NA	NA	NA
9	Increased cropping intensity	NA	NA	NA	NA
10	Reduced post harvest losses	NA	NA	NA	NA
	Total	NA	NA	NA	NA

NA – Not applicable

4.5 Impact of the benefits

A single activity of seed minikits, and a very limited implementation of other two components, has greatly limited the programme benefits. The high yielding variety seeds have impacted the cultivation of feed in two ways. About 25 per cent beneficiary farmers reported that the wheat productivity by using the improved seeds has increased in the range of 20-30 per cent. The component of subsidy has made these seeds quite cheaper and hence about 61 per cent farmers felt that the material cost of production of wheat has declined in the range of 15-20 per cent (Table 4.5). No other benefit emerging out of use of seed minikits has been reported by any of the farmers.

Table 4.5: Impact of the benefit availed under NFSM

Sl. No.	Benefit derived/Name of the implement	Seed mini kits of high yielding varieties / hybrid Wheat
1	% increase in productivity	20-30 %
2	% fall in material cost	15-20 %
3	% fall in water use	0
4	% fall in labour cost	0
5	% reduction in losses after intervention	0
6	% increase in price of the output because of better quality	0
7	Improvement in soil health (% of HHs who have mentioned "yes")	0
8	Improvement in human health (% of HHs who have mentioned "yes")	0

4.6 Cost and returns of Wheat Cultivation

The details of cost of cultivation and returns from cultivating wheat by NFSM and Non-NFSM farmers has been presented in Table 4.6 wherein it may be seen that none of the farmers of either category was using hired labour, their sole dependence being on family labour. The per acre use of

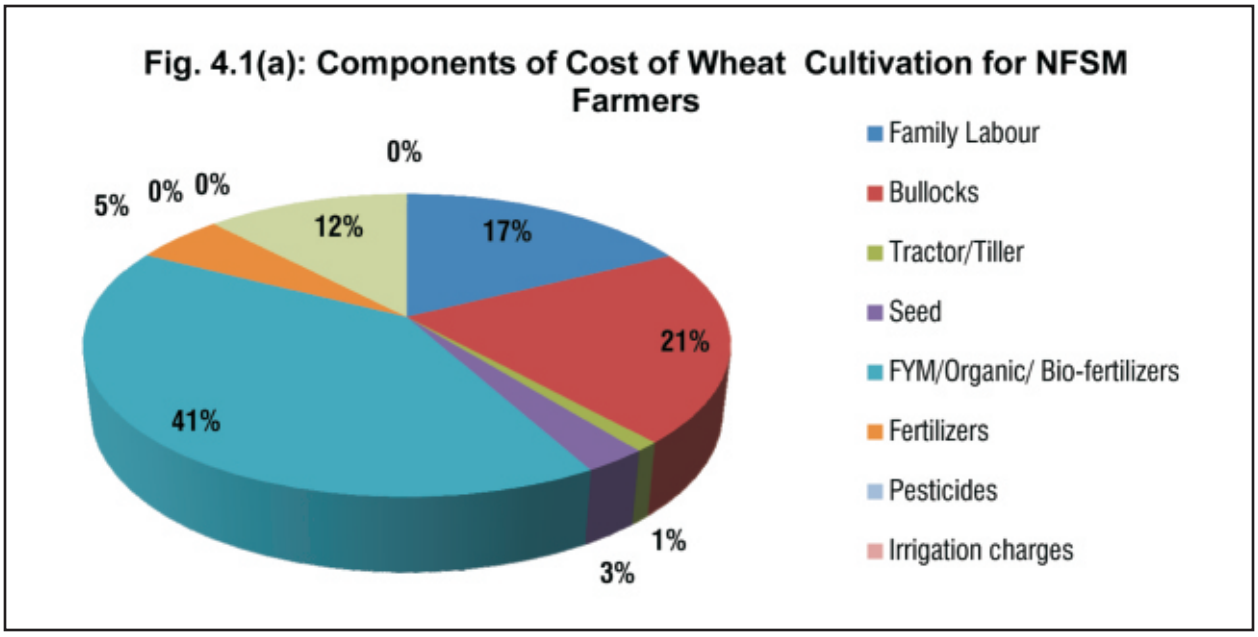
family labour by NFSM farmers was about 10.46 man days resulting in a cost of Rs.2615 per acre. The corresponding figures for Non-NFSM farmers were 10.02 man days and Rs.2505 per acre. The use of tractor/tiller was almost negligible, entire dependence was on bullocks. Both the categories were using five bullock pair days with a marginal difference in value of use of bullocks.

The seed rate on Non-NFSM farmers was marginally higher (42.78 kg per acre) but there was huge difference in value because of the fact that substantial subsidy was available for NFSM category farmers. The use of FYM etc. was also marginally higher on Non-NFSM farms with matching difference in the value. However, they were using about 46 kgs of fertilizer worth Rs.970 whereas the use of fertilizers on NFSM farms was about 37 kgs per acre the value of which was Rs.785 only. There was negligible expenditure on pesticides by Non-NFSM farmers; this input was not at all used by NFSM farmers. None of the farmers of both categories paid any irrigation charges. The harvesting and threshing charges were Rs.1802 and Rs.1545 per acre respectively for NFSM and Non-NFSM farmers.

Taking all these costs in to account, the cost of wheat cultivation was Rs.15617 per acre on Non-NFSM farmers in comparison to Rs.14869 per acre in case of Non-NFSM farmers.

The gross returns have been calculated by adding the value of main and by-products. It is evident that the value of by-product forms very high proportion of gross returns which appears to be unrealistic. But the wheat by-product is not sold by the farmers as it is used as fodder and its demand is so high that it is purchased from the state of Punjab. In absence of price determination through local trade, the purchase price of wheat by-product in Punjab and adding to it, transportation, labour and handling costs, the price has been determined which has been used as a proxy for local traded price. Naturally, the computed price is too high but, in absence of any other alternative, has been used for valuation. On the basis of this valuation, the NFSM households were getting a gross return of Rs. 34209 of which Rs. 16120 was the value of by-product. On the other hand, Non-NFSM households were getting a gross return of Rs. 33009 with Rs. 15634 being the value of by-product.

By making this investment the NFSM farmers were able to get a net income of Rs.19340 per acre which figure for Non-NFSM farmers was Rs.17392 per acre. The resultant cost of wheat production was Rs.1247 per qtl on NFSM farms in comparison to higher cost of Rs.1360 per qtl on Non-NFSM farms.



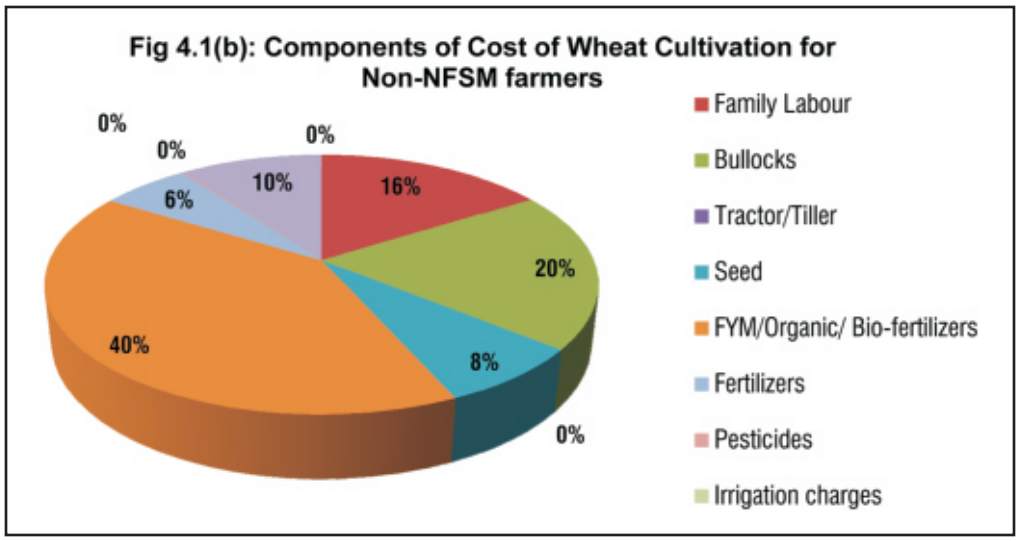
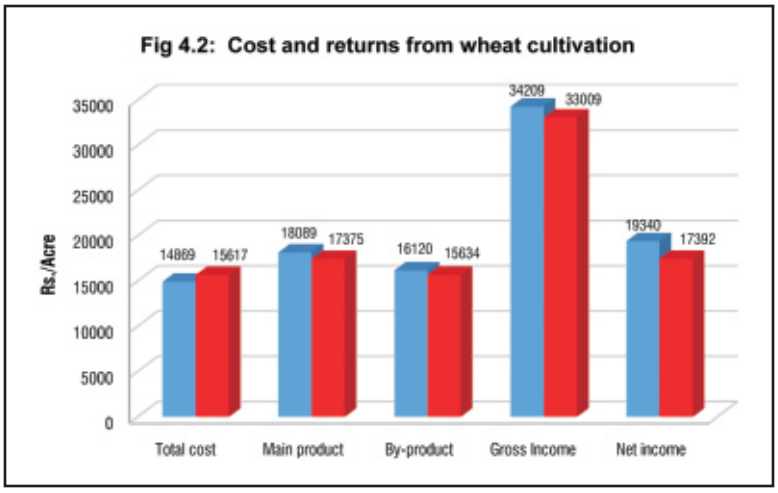


Table 4.6: Per acre Cost and Return of Wheat* in Rabi 2012-13

Particulars	Unit	NFSM		Non-NFSM	
		Quantity	Value (Rs.)	Quantity	Value (Rs.)
Hired labour	Man days	0	0	0	0
Family Labour	Man days	10.46	2615	10.02	2505
Bullocks	Pair/day	5	3079	5	3091
Tractor/Tiller	Hours	0	150	0	0
Seed	Kgs	41.80	396	42.78	1169
FYM/Organic/ Bio-fertilizers	Tons	6.04	6042	6.31	6313
Fertilizers	Kgs	37.37	785	45.94	970
Pesticides	Kg/lit	0	0	0.06	24
Irrigation charges	Rs.	0	0	0	0
Harvesting & Threshing	Rs.	0	1802	0	1545
Bagging, Transportation & marketing cost	Rs.	0	0	0	0
Total cost	Rs.		14869		15617
Main product	Kgs	1191.70	18089	1148.79	17375
By-product	Kgs	1791.08	16120	1737.16	15634
Gross Income	Rs.	0	34209	0	33009
Net Income	Rs.	0	19340	0	17392
Cost per quintal	Rs.	0	1247	0	1360



4.7 Marketing Channels and Marketed Surplus

The only channel adopted by both, NFSM and Non-NFSM farmers, was the disposal of wheat in local market. Table 4.7 reveals that higher percentage of NFSM farmers, about 69 per cent were selling the surplus wheat in local market whereas only 50 per cent of the Non-NFSM farmers were selling wheat in local markets. The percentage of the value marketed was also higher, 47.08 per cent, for NFSM farmers whereas this percentage for Non-NFSM farmers was only about 40 per cent indicating positive impact of seed distribution under the programme.

Table 4.7: Marketing channels and marketed surplus of Wheat*

Sl. No.	Particulars of output sold	NFSM		Non-NFSM	
		% of HH to the total	% of the value marketed	% of HH to the total	% of the value marketed
1	Wholesale market	0	0	0	0
2	Local market	69.33	47.08	50.00	39.92
3	Merchant	0	0	0	0
4	Co-operative	0	0	0	0
5	Government	0	0	0	0
6	Intermediaries	0	0	0	0
7	Private company	0	0	0	0
8	Mills	0	0	0	0
9	Others	0	0	0	0

4.8 Summing up

It may therefore be concluded that though the programme has only just begun in the state the positive impact of programme implementation is obvious in the farm of lower cost of cultivation as well as production for programme beneficiary farmers. The higher production of wheat has resulted in higher percentage of farmers who were able to generate marketable and marketed surplus. This calls for programme implementation in full earnest so that larger number of farmers is benefited located in larger geographic area and the extent of benefits is also improved. This will also be important to implement all the programme components to make the programme effective.

CHAPTER 5

PARTICIPATION DECISION, CONSTRAINTS AND SUGGESTIONS FOR IMPROVEMENT OF NFSM

The participation in the activities of any development programme depends on the perceived benefits by the target group. The availability of subsidy and improved inputs are the main driving force for majority of the farmers. However, the innovator and forward looking farmers also look forward for the availability of modern technology which will help them in future. In addition to this, the participation is determined by the factors like social and educational background, present level of farm economy etc. Taking some of these important variables in to consideration, it has been tried to analyse as to what extent these determine the participation level in NFSM activities.

5.1 Determinants of Participation in NFSM – Functional Analysis

The analysis of factors determining the participation of households in NFSM activities has been carried out in this section and this analysis is based on regression analysis. Among various forms of regression analysis, Logit regression is considered one of the best for such type of analysis. Logit regression is used when the dependent variable assumes only two values, either '0' or '1' representing the absence or presence of response. In the present case the dependent variable is in the form of 'participation or non-participation' in NFSM activities and hence the Logit regression analysis has been carried out for the purpose. It was anticipated that the participation is determined by the factors like family and holding size, educational background, social categorisation, level of irrigation etc. The complete list of independent variables can be seen from the Table 5.1 which also presents the results.

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

Independent variables	Coefficient	t-Value
Age (Years)	-0.0103	-1.1845
Education		
Higher secondary	-0.1758*	-2.9801
Operational holdings (acres)	1.5622	0.2015
Family size or No. of family members dependent on farming	-0.0757	-1.0964
Caste		
SC/ST	-0.3004*	-2.4734
OBC	1.5188	0.4955
Others	0.2724*	2.5731
Income from farming	-5.1E-06	-0.3812
Percentage of irrigated to the total operational area	0.0015	0.6667
Farm asset value (Rs.)	-6.2E-06	-0.3587
Constant	0.5691**	1.7048
Likelihood ratio test statistic	387.782	
Goodness of fit	415.292	
Cox and Snell R^2	0.132	
Nagelkerke R^2	0.196	

Note: * - Significant at 1 % level of probability
** - Significant at 5 % level of probability

It may be seen from the table that R2, coefficient of multiple determination which explains the percentage of variation in dependent variable due to the independent variables included in the model is

quite low and is also insignificant. It may also be mentioned here that these are the best possible results obtained after different combinations of independent variables. The only independent variables significantly affecting the participation in NFSM were the level of education of higher secondary level, cast status of being SC/ST and belonging to other categories. The coefficient of operational holding was with positive sign and was significant at one per cent level of probability. The constant determined by the model was also significant at five per cent level of probability. All other independent variables turned out to be insignificant.

5.2 Constraints faced in availing the NFSM Benefits

The mere fact that only about 18 per cent of the selected beneficiaries (Table 5.2) faced some problems while availing the benefits of the scheme is the testimony of the fact that the scheme is being implemented with high efficiency in the state. But this figure can also be viewed in the light of the fact that limited benefits were available under the programme and many programme components were yet to be operationalized. This has been possible with concerted efforts of the concerned officials of the department of agriculture making it possible that about 51 per cent of the respondents stated that the information about the scheme reached them in very comprehensive manner. About 98 per cent of the respondents thought that procedure for the subsidy quite easy with all the respondents stating that only few documents were required for availing the subsidy. But only about four percent sampled farmers responded that eligibility or criteria for availing the subsidy is provided to the households. This leaves a wide gap in flow of information to farmers and this aspect needs to be taken care of urgently for still better results.

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

% of beneficiaries faced problem/s while availing the scheme		18.33	
Sl. No.	**Constraints**	**Yes (%)**	**Remarks**
1	Information about NFSM reaches comprehensively to the households	50.91	None
2	Eligibility or criteria for availing the subsidy is provided to the households	3.64	None
3	Procedure for the subsidy quite easy (if not provide details in remarks)	98.18	None
4	Only few documents are required for availing the subsidy (if no, provide details in remarks)	100	None
5	Subsidy paid after purchase while initial payment remains the highest problem	5.45	None
6	Institutional financing facility available under the programme	47.27	None
7	Capacity building/technical advice is provided under the programme	3.64	None
8	Long time gap between the purchase and receiving the subsidy amount	49.09	None
9	Biased towards large land owners	0	None
10	Poor quality of materials/machinery are supplied	0	None
11	Others	0	None

The subsidy is reimbursed to farmers after they have purchased the inputs, which is normal practice. But 5.45 per cent respondents felt that initial payment for the purchase of inputs is the big problem for them as they do not have required cash for purchasing the costly inputs. About half of the respondents also complained that there is long time gap between the purchase and the reimbursement of subsidy. It was also heartening to note that none of respondents made any complaint of the nature that the programme has a bias towards large farmers or it is being implemented with such a bias by the programme implementers and that poor quality of materials/machinery are supplied.

5.3 Suggestions for Improvement by Beneficiaries

During the interaction with beneficiary farmers, many suggestions for improvement in the programme were observed and presented in Table 5.3. It was felt by five per cent of the respondents that no information about aims and objectives were made available by the department. About 35 per cent farmers felt a need for providing the technical advice in more comprehensive manner. Some of the farmers thought that they already knew whatever was being told to them. This was partially due to the fact that queries of the farmers were not properly addressed as opined by about 40 per cent respondents. About half of the respondents were of the view that the programme objectives cannot be achieved, despite all efforts, if irrigation is not provided to them. Thus, development of irrigation infrastructure should be an important component of the programme. In addition to this, about 20 per cent farmers were of the opinion that the inputs of only best quality should be provided for ensuring the improvement in crop productivity. The most common suggestion, about 90 per cent farmers desiring, was that the provision of the programme should be extended to all the crops. Thus, the suggestions for improvement of the programme pertain only to imparting the information and quality inputs but also to extending the scope of the programme.

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

Sl. No.	Suggestions	% of the beneficiaries
1	No information about aims and objectives of NFSM provided	5
2	Technical advice should be provided in more comprehensive manner	35
3	Queries of farmers should be properly addressed	40
4	Pick and choose method of beneficiary selection should not be adopted	10
5	Provision of irrigation should be an important component of the programme	50
6	Best quality inputs only should be provided	20
7	Extend the programme to all major crops	90

5.4 Suggestions for Improvement by Non-beneficiaries

The non-beneficiaries of the programme obviously had little information about the programme as compared with the beneficiaries and hence the only a few suggestions came from them, Table 5.4 presents the results. All the non-beneficiaries wanted that irrigation should be included in the programme for the betterment of the farming community. About 85 per cent of the farmers also suggested that even if a particular farmer is not a beneficiary of the programme, he should be entitled to get improved seeds under the programme. About 75 per cent farmers suggested that information about the programme should be provided to all the farmers.

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

Sl. No.	Suggestions	% of the non-beneficiaries
1	Provide information to all the farmers	75
2	Include irrigation as a programme component	100
3	Provision of seeds to all the farmers	85

5.5 Reasons for non-participation

The only reason put forward by the non-beneficiaries was that they had no information about the programme. Otherwise they would have definitely participated and would have not foregone the benefits (Table 5.5).

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

Sl. No.	Suggestions	% of the non- beneficiaries
1	No information	100

5.6 Suggestions for the inclusion of Non-beneficiary in the Programme

All the farmers agreed that the programme should get wider publicity for ensuring the inclusion of non-beneficiaries – Table 5.6. It was revealed by the respondents that some of the farmers will not be interested in the programme as they might not be cultivating the crops currently being covered under the programme and hence they naturally would not be interested in the programme. About 80 per cent respondents felt that scope of the programme should be widened to include all the crops. This will definitely motivate the non-beneficiary farmers to join it. About 75 per cent respondents felt that the provision of technical advice even to non-participant farmers would in better interests of development of not only the non-participating farmers but also for the agricultural sector as a whole.

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

Sl. No.	Suggestions	% of the non- beneficiaries
1	Wider publicity of the programme	100
2	Wider scope (inclusion of all crops)	80
3	Provision of technical advice to even non-participant farmers	75

5.8 Summing up

The analysis indicates that only the size of holding was the significant variable affecting the participation of respondents in the National Food Security Mission. There were no major constraints reported by the respondents in availing the programme benefits. Major suggestions for improving the quality and efficacy of the programme were inclusion of irrigation as a major programme component and extension of the programme to all other major crops. The non-beneficiaries of the programme wanted wider publicity of the programme and widening of its scope.

CHAPTER 6

CONCLUDING REMARKS AND POLICY SUGGESTION

6.1 Major Findings

During the 10th five year plan there was an improvement only in net area sown and cropping intensity but the situation has worsened for all other indicators. No conclusion could be drawn for 11th five year plan due lack of data. The performance of NFSM districts in respect of area, production and yield of paddy was better as compared to Non-NFSM districts as judged by respective growth rates. More or less same picture emerged in case of wheat but trend was not as definite as in case of paddy. The funds made available for paddy and wheat were completely utilized during the two years of the programme in the state. There was no spillover of funds from one district to other. But there was mismatch between outlays and expenditure of category-wise interventions for both rice and wheat some components consuming more than their outlays.

The analysis indicates that the average household size was slightly higher in case of Non-NFSM category. The percentage of persons engaged in farming was higher among NFSM households. Illiterates formed higher proportion of Non-NFSM category. The NFSM category had higher percentage of SC/ST and OBC households and also enjoyed higher average annual income from all sources. Larger percentage of NFSM farms were under marginal category. The total average area operated was also higher for NFSM category farms and same was the case for total owned land. Cropping intensity was marginally higher on NFSM farms but case was just reverse in case of irrigation intensity. Paddy, wheat and maize were main cereal crops on both categories of farms. Minor cereals and grams were grown only on NFSM farms and other pulses only on Non-NFSM farms. The Non-NFSM farms preferred cultivation of fruit.

It was found that the 'per household' agricultural income for NFSM category was higher but this income on 'per acre' basis was lower. Paddy, wheat and maize, the main cereal crops, were yielding positive returns in both cases. The cultivation of fruit and vegetables yielded significant income for farmers. The farm asset holding was quite meagre with almost absence of heavy machinery and equipments. The condition of indebtedness is not at all alarming with about five per cent of the household under debt from commercial banks taken for agriculture and utilized for the same purpose.

Despite the recent implementation of the programme, the positive impact of is obvious in the farm of lower cost of cultivation as well as production for programme beneficiary farmers. The higher production of wheat has resulted in marketable and marketed surplus. The analysis indicates that only the size of holding was the significant variable affecting the participation of respondents in the programme. There were no major constraints reported by the respondents in availing the programme benefits

6.2 Concluding Remarks

The programme is in nascent stage in the state and being implemented with limited components. As such the programme impact is not very apparent and may be visible only after its implementation in totality and also after reasonable time has elapsed when the modification/improvements have taken firm roots. It appears that the present evaluation study is somewhat premature, despite that it has been able to indicate the present level of programme implementation and the way it has impacted the cost of cultivation. It is also desirable that the information concerning the programme flows to non-beneficiaries and not only that they have to be made aware of the programme components and available benefits. The observation of many

respondents that they already knew whatever was being told in the demonstration camps indicates desirability of revising the information contents and delivery system. Almost every respondent stressed the importance of irrigation and its inclusion in the programme as a major component. This suggestion has to be viewed in the light of fact that the state has even less than 20 per cent area as irrigated and presently the rain-fed agriculture has to contend with highly erratic rains. The general observation of efficacy of heavy agricultural machinery and equipments in the hilly terrain of the state combined with prevalence of marginal and small holdings was seconded by almost all the respondents. This calls for provision of improved hand or bullock operated tools for states like Himachal Pradesh.

6.3 Policy Suggestions

On the basis of responses, interactions and analysis, the following policy suggestions emerge.

- It is indicated that sampled farmers are deriving significant proportion of farm income from cultivation of fruit and vegetables. This calls for extension of programme to all major crops of the state, especially cash crops like fruit and vegetable should find a place in the programme. Himachal Pradesh is renowned for cultivation of apple and other temperate fruit and hence the programme benefits be extended to horticultural sector. This is true not only for the state of Himachal Pradesh but for all the hill states of the country.
- The programme objective of enhancing the production of crops covered under the programme cannot be achieved unless adequate provisions are made for irrigation. In Himachal Pradesh only about 20 per cent of the cultivated area is irrigated. The components lime improved seeds and fertilizers etc will not translate into higher yields unless supplemented with adequate provision of irrigation. Hence, irrigation should be included as a major programme component.
- The programme should have farm focus rather than crop focus. All the major crops and on-farm activities should be covered under the programme. Concentrating efforts only on a single crop will not result in sustainable farm development. This should be an effective strategy for ensuring food security.
- There should be inbuilt resilience in the programme to decide the relevant and effective programme components for a given state. Thus, tailoring the programme according to local socio-economic and agro-climatic conditions should be feasible for local programme implementation agencies and policy planners. The component of farm mechanisation should be replaced with irrigation for the state of Himachal Pradesh. Local programme administrators should have this freedom of decision.
- The corollary of above suggestion is that hilly states where the terrain and hilly topography does not allow the use of heavy farm machinery should be allowed to opt for improved and small hand or bullock operated implements for benefit of wider sections of the farming community and too with less than the given budget.
- There is no harm if technical advice is provided to non-participant farmers. This will help in wider percolation of benefits and will motivate them to be part of the programme.

The filed level workers need to be trained to improve the training contents and technical advice. The quality of interactions also needs improvement which can be ensured through training the trainers.

Coordinator's Comments on the Draft Report

Comments on the report “Impact of National Food Security Mission (NFSM) on Input use, Production, Productivity and Income in Himachal Pradesh”

Submitted by AERC, Shimla, Himachal Pradesh

1. **Title of the draft report examined:** Impact of National Food Security Mission (NFSM) on Input use, Production, Productivity and Income in Himachal Pradesh
2. **Date of receipt of the Draft report:** .....February, 2015
3. **Date of dispatch of the comments:** 23 February 2015
4. **Comments on the Objectives of the study:** The objectives of the study have been fully addressed. The author has strictly adhered to the chapter outline and table formats given by the coordinating centre, ADRTC, ISEC, Bangalore. The author/s have tried to capture the impact of NFSM in the state using primary data given the fact that the program started in 2012-13. But not much can be known about the NFSM impact from the trend analysis of agricultural indicators presented in the chapter 2(Objective 1).
5. **Comments on the methodology:** The common methodology proposed for the collection of primary data and tabulation of results has been followed.
6. **Comments on analysis, organization, presentation etc.:** Although the report has given useful information about the NFSM program and its impacts, the report needs major changes for further improvement, which are given as follows:

Chapter 1: Introduction

- Mention the references wherever numerical facts are given
- Page number 4 section 1.5: Insert "Among the NFSM implemented districts" after ".....Himachal Pradesh for detailed study."
- Author needs to include the logistic regression methodology giving details about the reasons for selection of independent variables in the section 1.5.

Chapter 2: Impact of NFSM on food grains production in the state – A time series analysis

- The state has implemented the NFSM in 2012-13. In order to know the impact of NFSM from the secondary data, update the tables till 2013-14 (or 2012-13). By doing so, agricultural indicators can be compared between the implemented years and un-implemented years. Analysis with the 9th, 10th and 11th FYP plan data can inform about the trend but not the NFSM impact.
- The values of Average Annual growth rates (AAGR) presented in the tables are incorrect. I think the authors have mentioned the year to year growth rate of the last two years of 9th, 10th and 11th FYP instead of mentioning the AAGR. For instance, consider the net irrigated area data for the 9th FYP presented in the Table 2.1, the estimated year to year growth rates were -1.07, 0.39, 23.16, -18.65. The AAGR is estimated by adding all these four values and then dividing by 4, which works out to 0.96%. In this chapter, -18.65 was mentioned instead of 0.96. Similar mistake was found in most of the tables and graphs. The 9th Plan average is annual average growth for the five years and not for the last year alone. Modify the entire write-up after incorporating the new estimates of AAGR. The formula for calculating annual growth rate is (current year - previous year) / previous year * 100 .
- Section 2.2 and 2.3 can be merged by presenting the tables, followed by the graph (Eg: table 2.2, fig 2.2A & 2.2B) for better understanding of the results. Similar structure can be followed for remaining sections.

Chapter 3: Household characteristics, cropping pattern and production structure

- Modify the section 3.2 (Characteristics of operational holdings), as it is not clearly giving the meaning. The details asked was per household and not in terms of total sample.
- If the rain fed area is 1.18 acres and irrigated area is only 0.54 acres I have doubt on irrigation intensity of 198.6, please recheck.

- Incorporate the names of crops for crop categories viz., fruits and vegetables, in the increasing order of importance.
- How value of productivity per acre can be Rs 88197 and 109327 for NFSM and Non NFSM households, it is too high. If one divide production per hh by net operated area one gets productivity per acre and it works out as 197572/1.28=154353 and similarly a different figure for non NFSM as well. In the best of cases like Punjab productivity value does not exceed Rs 50000 per acre. Please check the data.
- Table 3.6b shows fruits gross returns per acre equal to Rs 571875 and cost Rs 411012 and profit Rs 530763 how is this possible. The profit works out Rs 160863. Similar is the case with non NFSM farmers.
- Table 3.8 and 3.9 the amount of credit and purpose of credit total should be equal that is not matching
- More discussion/justification of results is necessary for sections 3.5 to 3.7.

Chapter 4: Impact of NFSM on farming

- How all farmers are found aware of NFSM which is unbelievable as we found mostly farmers are not aware about such programmes being mostly ignorant.
- As per the financial expenditures presented in the chapter 2, it is understood that the NFSM program started in 2012-13. But in Table 4.2, the particulars of benefits pertains to 2007-08 to 2013-14. Clarification is necessary here.
- Table 4.6: How can by-product be almost equal to the main product. This is completely wrong reporting. Please check the figures. The value of output per acre turns out Rs 34 thousand and therefore gross value of output per acre per annum will not exceed Rs 70 thousand given the cropping intensity is around 2.
- Table 4.7: Marketing channels do not add to 100% that is compulsory.
- More discussion/justification of results is necessary for section 4.6.

Chapter 5: Participation decision, constraints and suggestions for improvement of NFSM

- As the estimated logistic model is not a better model considering the goodness of fit indicators presented in Table 5.1 and hence re-do the analysis by selecting appropriate variables for obtaining realistic results that better explains the field situation.
- Insert Table 5.2 in the section 5.2 only.

Chapter 6: Concluding remarks and policy suggestions

- Concluding remarks should include the major findings of the study (2nd, 3rd, 4th and 5th Chapters), followed by the text mentioned in the section 6.1.
- Little more elaboration is necessary on each point in the policy suggestions considering the results of the study.

General remarks

- There is ample scope for correction of errors, improvement of the grammar and language. Hence proofread the report carefully before submitting to us as well the ministry.
- Executive summary has to be modified after incorporating the above comments and suggestions.

7. Overall view on acceptability of report

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

Action taken report

Chapter 1: Introduction

- References mentioned
- Insertion made
- Logistic regression methodology presented

Chapter 2: Impact of NFSM on Foodgrains Production in the State – A Time Series Analysis

- The requisite data is not available and hence cannot be presented
- The corrected values, as per instruction, have been presented
- Necessary changes made

Chapter 3: Household Characteristics, Cropping Pattern and Production Structure

- Changes made
- Data checked and found correct
- Names of crops mentioned
- Checked and necessary corrections made. The high productivity values are due to high profits from cultivation of fruit and off season vegetables.
- The typographic mistake corrected
- The two figures will not tally as one pertains to amount outstanding and other to purpose of loan.
- Done

Chapter 4: Impact of NFSM on Farming

- All sampled farmers are aware of the programme as the department of agriculture has provided this information to farmers even during other programmes
- The benefits pertain to year 2012-2013 to 2013-2014 and not from 2007-08. Necessary correction made.
- The reason for high value of by product provided in the main text
- Marketing channels will not add up to 100 as all the farmers do not have marketed surplus of wheat
- Needful done

Chapter 5: Participation Decision, Constraints and Suggestions for Improvement of NFSM

- Model retried and revised findings presented
- Needful done

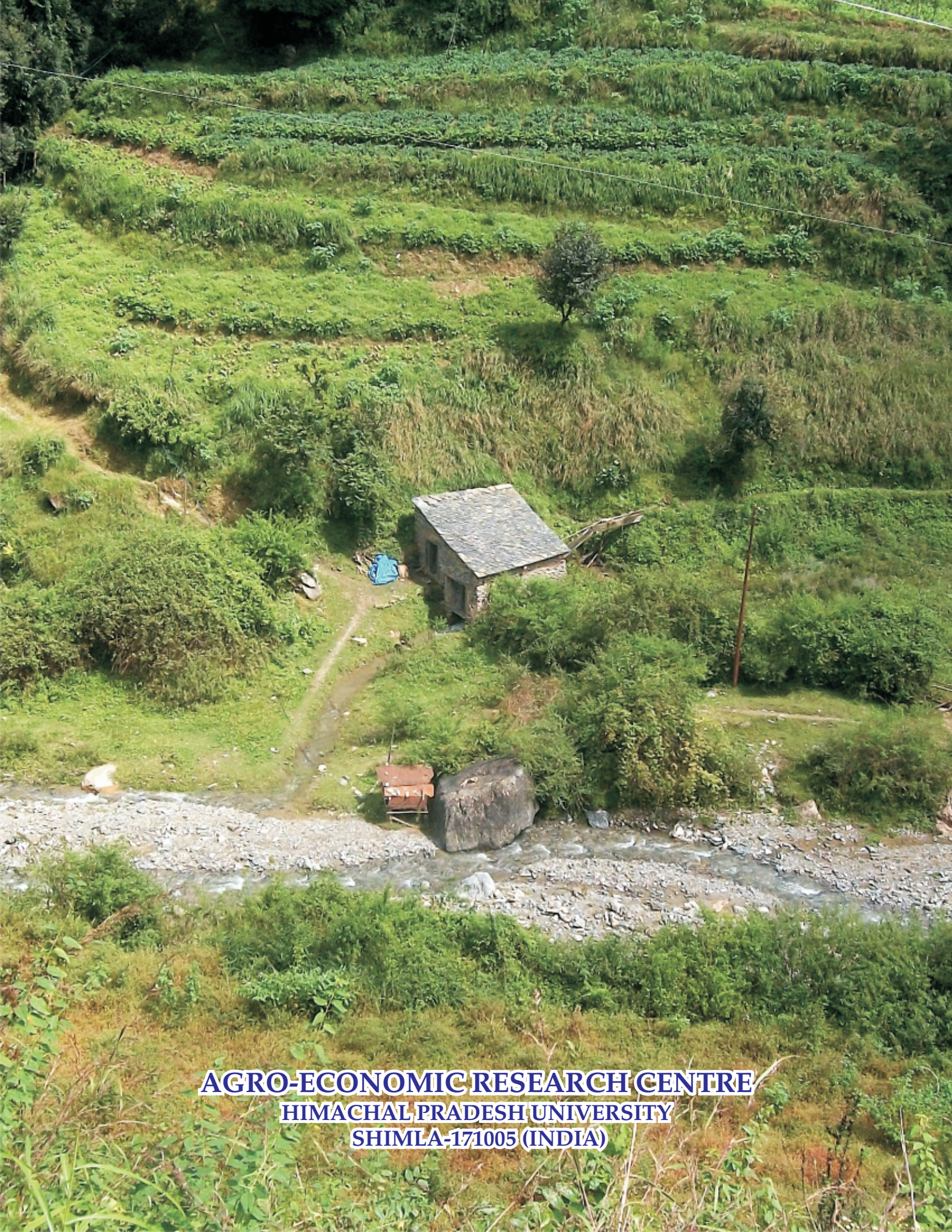
Chapter 6: Concluding Remarks and Policy Suggestions

- Needful done
- Needful done

About the Authors

Dr. Ranveer Singh is Officer Incharge/Head at Agro-Economic Research Centre, Himachal Pradesh University, Shimla. He has worked as Principal Investigator for the projects financed by World Bank, ICIMOD, GTZ, USAID, Ministry of Agriculture, Government of India and government of Himachal Pradesh. His research and consulting interests focus on agriculture and rural development policies, agricultural marketing, natural resources management, project evaluation and studies of resettlement and rehabilitation of displaced people under hydro electric projects. He nominated as member of various state level Committees and presently Member of External Committee of Experts constituted by the SJVNL for Undertaking impact study of Corporate Social Responsibility (CSR) & Sustainable Development (SD) Projects. He is author of two books and 70 research papers published in reputed national and international journals. He has completed about 60 research projects for national and international organizations. He has guided fifteen students of Ph. D and M. Phil in Agricultural Economics.

Dr. C.S. Vaidya is a senior economist working with the Agro Economic Research Centre of Himachal Pradesh University, Shimla for last 32 years and has very good knowledge of diverse agro-climatic and cultural conditions of mountainous areas. He has been instrumental in successful completion of many studies conducted for international agencies like ICIMOD, USAID, GTZ, FAO and World Bank, etc. Dr. Vaidya has conducted numerous studies for Government of Himachal Pradesh and Ministry of Agriculture, GOI on such diverse issues such as livelihood strategies, cost of production, marketing management, project impact evaluation etc. His research focuses on evaluation and monitoring of development interventions and resettlement and rehabilitation policies of project affected population, predominantly hydropower projects. He is an expert in conducting cost of cultivation studies for field and horticultural crops, project evaluation, impact studies and studies on policy analysis and has deep interest in organic farming and has worked on national level studies on this subject. Dr. Vaidya's work in this field has led to publication of a book on environmental and economic aspect of organic farming. Conducting field studies in marginalized communities is one of his strong points. He has number of research reports, research articles published in national and international journals to his credit. He is also guiding Ph.D. and M.Phil. students of department of Economics of Himachal Pradesh University.



AGRO-ECONOMIC RESEARCH CENTRE
HIMACHAL PRADESH UNIVERSITY
SHIMLA-171005 (INDIA)