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IMPACT EVALUATION OF RASHTRIYA KRISHI VIKAS YOJANA
REPORT - II : SECTORAL REPORT


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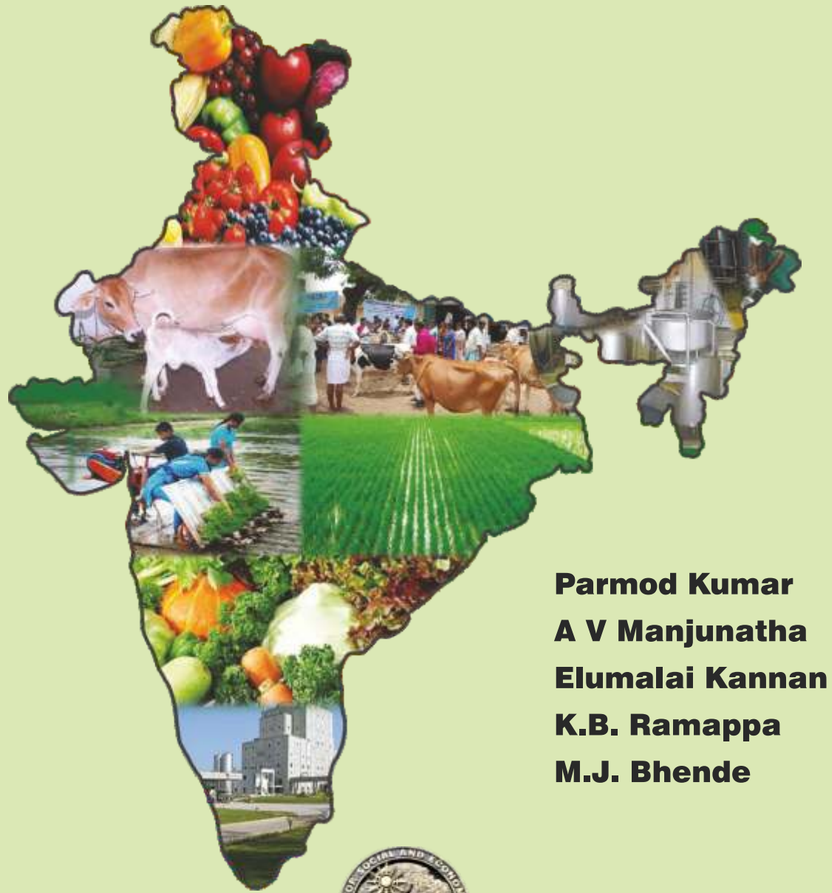
DRAFT REPORT

# IMPACT EVALUATION OF RASHTRIYA KRISHI VIKAS YOJANA

## REPORT - II : SECTORAL REPORT


Sponsored by : Department of Agriculture and Co-operation
(RKVY Division), Ministry of Agriculture, Govt. of India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# Chapter 1

# Introduction

## 1.1 Background

The food grain production in India which was falling short of meeting the food requirement of around 35 to 40 crore people during the 1950s has at present reached to a stage where not only it is sufficient to meet the demand of more than 120 crore people but also left with surplus that India is now exporting, especially rice and wheat. Implementation of series of agriculture development programmes by the government coupled with coordinated efforts of several research organizations, universities, councils and departments in the field of agriculture made this achievement possible. However, most of the agricultural development programmes during the earlier years were targeted with individual goals. This strategy lacked convergence of various agricultural programmes and departments. Coupled with falling public investment to agriculture, adverse terms of trade and lack of clear strategy on agriculture led to steady deceleration of agricultural growth during the late 1990s and early 2000s.

At that juncture, National Development Council (NDC) in its meeting on 29th May 2007, strongly felt the need to have a scheme that could congregate all the farming and its allied activities and revive agricultural growth in the country. The result was launching Rashtriya Krishi Vikas Yojana (RKVY) / National Agricultural Development Programme (NADP) implemented during the 11th Five Year Plan (FYP) by all the states and Union Territories (UTs) of India. It was launched as a special Central Assistance Scheme to incentivize the states to draw up plans for their agriculture sector more comprehensively considering their respective agro-climatic conditions, natural resource base and technology issues and also integrating livestock, poultry and fisheries into the overall agrarian scenario**.** It was designed as a state plan scheme with full extent of flexibility given to the states to select projects suitable to their local conditions for generating growth in agriculture and allied sectors.

RKVY has two important objectives: First, to incentivize the states and UTs for enhancing agricultural expenditure, and second, to incentivize the states and UTs to generate additional growth in agriculture and allied sectors by better planning and undertaking the suitable growth oriented projects. The RKVY is unique for its ability to not only convergence of several sectors of farming activities but also all agricultural and allied departments and research institutions. Attaining an annual agricultural growth rate of more than 4 per cent was core objective of the RKVY programme. The other major objectives associated with RKVY during 11th Plan as indicated in the RKVY guidelines were:

- Incentivizing the states to attract public investment in agriculture and allied activities
- Provide flexibility and autonomy to states in planning and executing agriculture allied sector schemes
- Ensuring preparation of agriculture plans for districts and states based on agro-climatic conditions, availability of technology and natural resources
- Ensuring that the local needs / crops / priorities are better reflected in agricultural plans of the states

- Narrowing yield gaps and to enhance farming profitability;

In order to realize all these objectives, RKVY was implemented with some broad guidelines from the Planning Commission, with high flexibility including approvals at the level of state governments. The other key feature of RKVY was: the states could avail funding from centre to the extent of 100 per cent to implement programmes in their respective states. However, eligibility of state for seeking fund from the centre for the RKVY programme was contingent upon the states' maintaining or increasing its plan expenditure for agriculture and allied sectors. The base line expenditure was determined based on the average expenditure incurred by the state government during the three years prior to the previous year. If a state lowers its investment in the subsequent years, then the balance resources for completing the projects already commenced had to be met by state itself. Preparation of District and State Agricultural Plan was also mandatory for drawing funds.

With these goals and features, RKVY programme was implemented in 28 states and 3 UTs covering 20 sectors during the 11$^{th}$ Five Year Plan. Each sector was further sub-divided into sub-sectors totalling to 152 numbers covering all the agriculture and allied activities including the research, information technology, extension, training and also some non-farming activities. As indicated in the RKVY operational guidelines for the 12$^{th}$ Five Year Plan (MOA, 2014). RKVY incurred an expenditure of Rs 21586.6 crore out of released amount of Rs 22408.8 crore to implement 5768 projects across various sectors during the 11$^{th}$ Five Year Plan. Activity wise share in value of projects and numbers of projects are shown in Table 1.1. Micro and minor irrigation accounted for 15 per cent of the total RKVY expenditure during the 11th FYP, followed by aggregate of animal husbandry, dairy development and fisheries (18.6 per cent), Horticulture (9.4 per cent), crop development (9 per cent), seed (8.2 per cent) and agricultural mechanization (8 per cent). The remaining 12 sectors accounted for 32 per cent of the total expenditure. A detailed project report about the regional and sectoral analysis of projects/activities under RKVY has already been submitted to the Director, RKVY, Department of Agriculture, Ministry of Agriculture, Government of India under the ambit of this project.

## 1.2 Impact of RKVY on Major Growth Indicators

The macro-level impact of RKVY has been measured using selected growth indicators. As a result of the RKVY program, the total agriculture budget of all 28 states' outlay increased by 62 per cent in the 11th Plan over the 10th Plan (RBI, 2013). The expenditure on agriculture as a percentage of agriculture GSDP also increased from 8.80 per cent in 10th Plan to 12.42 per cent in 11th Plan (DES, 2013). The overall growth rate of GSDP of 28 states (excluding the UTs) also went-up from 7.61 per cent in 10$^{th}$ FYP to 8.63 per cent in the 11$^{th}$ FYP. Similarly, the overall agriculture GSDP of 28 states grew from 2.38 per cent in 10$^{th}$ FYP to 3.66 per cent in 11$^{th}$ FYP. The highest agricultural GSDP growth was found in Gujarat with 9.73 per cent per annum during 10$^{th}$ FYP. During the 11$^{th}$ FYP, Chhattisgarh had the highest rate of growth of 7.48 per cent (CSO, 2013). There was also an increase in the overall growth in agriculture and allied sectors, 3.7 per cent during the 11$^{th}$ Plan as compared to 2.4 per cent of 10$^{th}$ Plan period (DAC, MoA, 2014). The increase in agricultural growth rate is especially encouraging as the increase has come after consecutive declines in the previous two FYPs. These changes clearly indicate the testimony of the scheme's contribution to stimulating growth by capitalizing agriculture sector although it is difficult to attribute the rise in growth rate entirely to the RKVY programme.

Table 1.1: Activity wise share in value and numbers of projects during the 11th Plan under RKVY - All India

| Sl. No. | Sectors | No. of projects | % to the total projects | Expenditure (crores) | % to the total expenditure |
|---|---|---|---|---|---|
| 1 | Irrigation | 239 | 4.2 | 4111.26 | 15.0 |
| 2 | Animal Husbandry | 1064 | 18.5 | 3066.34 | 11.2 |
| 3 | Horticulture | 717 | 12.5 | 2572.94 | 9.4 |
| 4 | Crop Development | 372 | 6.5 | 2474.57 | 9.0 |
| 5 | Seed | 312 | 5.4 | 2237.46 | 8.2 |
| 6 | Agricultural Mechanisation | 231 | 4.0 | 2189.72 | 8.0 |
| 7 | Others | 148 | 2.6 | 1587.95 | 5.8 |
| 8 | NRM | 212 | 3.7 | 1397.98 | 5.1 |
| 9 | Markg. & PHM | 311 | 5.4 | 1341.01 | 4.9 |
| 10 | Extension | 309 | 5.4 | 1165.92 | 4.3 |
| 11 | Dairy Development | 252 | 4.4 | 1053.85 | 3.8 |
| 12 | Fisheries | 552 | 9.6 | 983 | 3.6 |
| 13 | Research | 392 | 6.8 | 776.54 | 2.8 |
| 14 | INM | 127 | 2.2 | 709.88 | 2.6 |
| 15 | Organic Farming | 156 | 2.7 | 676.4 | 2.5 |
| 16 | Cooperatives | 81 | 1.4 | 430.4 | 1.6 |
| 17 | IPM | 104 | 1.8 | 262.28 | 1.0 |
| 18 | Non-farm activities | 81 | 1.4 | 174.96 | 0.6 |
| 19 | Sericulture | 61 | 1.1 | 106.56 | 0.4 |
| 20 | Innovative programs | 28 | 0.5 | 95.08 | 0.3 |
| | Total | 5749 | 100.0 | 27414.1 | 100.0 |

Source: MoA, 2014

Despite the lack of significant increase in the gross cropped area or increase in cropping intensity between the 10$^{th}$ and 11$^{th}$ Plan, the production of food grain attained a new peak of 258 million tonnes during 11$^{th}$ Plan (DES, 2013). This may be due to an increase in land productivity per hectare supported by agricultural mechanization and irrigation projects under RKVY as well as incremental increase in agricultural budgets over the years after the inception of RKVY programme. The land productivity in value terms increased from Rs 41,000 in the 10th Plan to approximately Rs 49,000 in the 11th Plan. Even after accounting for inflation, the productivity gains were significant. The percentage of net irrigated to net sown area, cropping intensity and irrigation intensity all indicated a positive trend from the 10th FYP to 11th FYP. This increase was observed at the all India and at regional level as well (DES, 2013). There was also marginal increase in irrigation intensity from 137.2 during the 10th Plan to 138.8 at the end of 11th Plan. There was increased productivity in rice, wheat, pulses and coarse cereals while slight decrease in oilseeds and fibres (DES, 2013).

Thus, RKVY scheme has definitely played a role in the growth of agriculture sector while it is difficult to isolate the extent of RKVY's contribution for this growth. Encouraged by these results and to fully tap annual growth potential of agriculture and allied sectors, RKVY programme has been carried on to the 12th Five Year Plan with enhanced allocation of Rs 63246 crore, which is nearly 150 per cent increase over the 11$^{th}$ Plan and 50 per cent of the total allocation of Department of Agriculture during the 12th FYP. This clearly reflect the importance that Government of India (GoI) attaches to RKVY (MoA, 2014; MoA, 2012).

As a part of the 12th Five Year Plan, RKVY programme began from 2012-13 and has already completed two years of implementation. Until now, RKVY programme has utilized Rs. 11442.32 crores towards 2962 numbers of projects initiated across the country. During 11th Plan, states took up projects out of 20 major sectors listed under RKVY programme (MoA, 2014). The states are at liberty to choose appropriate components / activities and these components / activities must be adequately reflected in State Agricultural Plans (SAPs) and District Agricultural Plans (DAPs) and the implementing agents are ought to follow the elaborate guidelines of respective departments to which the projects belong to.

## 1.3 Objectives and Scope of the Study

The main objective of the Impact Evaluation Study (IES) of RKVY is to examine the extent to which the components and activities under the RKVY have actually met or / are meeting their stated targets (objectives) for improving agricultural productivity, production and in enhancing economic conditions of the farmers. The findings of the study will be presented in three reports; First report pertains to analysis of secondary data on major components of the scheme, allocation and utilisation of funds, outcomes and outputs of the programme at all India as well as at state level. The first report was already submitted by the ISEC, Bangalore to the Director RKVY, DOA, MOA. The current (second) report focuses on the regional and sectoral analysis based on the primary data collected from beneficiary farm households, and infrastructure/asset beneficiaries. The third and final report will present the report of the state level analysis. All these reports provide a feedback to DAC for correcting the loopholes in the programme, to achieve the desired results and to improve the efficiency of the RKVY programme**.**

## 1.4 Data and Methodology

The present report which is the secotral report in the series of three reports is based on the primary survey data collected from beneficiary farm household and infrastructure/asset beneficiaries collected from all the 28 states and 2 UTs as shown in Table 1.2. For the selection of beneficiary farmers, a multi-stage sampling method was followed. At the first stage, 20 per cent of the districts in the States and UTs were selected purposely based on the district-wise RKVY expenditures and interaction with the RKVY nodal/implementing authorities. In smaller states a minimum of 5 districts or whole state was selected if the state consists of fewer than 5 districts. In the next stage, two taluks from each selected districts were selected, drawing one taluk from the nearby district headquarters and the second at a distance of 15-20 kilometre from the district headquarter. Subsequently, at the third stage, 3-6 cluster/contiguous villages were selected from each taluk to collect primary data from 25 selected households. By following multi-stage sampling framework as well as through discussions with the nodal agency/implementing authorities, we selected 171 districts, 353 taluks, 3164 villages and 8174 beneficiary farmers (Figure 1.1). As significant expenditure (30 per cent of the total) was accounted for infrastructure/assets development during the 11th Plan, a suitable number of infrastructure and asset beneficiaries were covered in each state representing various sectors (Table 1.2). Detailed information was collected about the socio-economic profile of the farm households, interventions and its costs and subsidies, usage of the intervention/benefit and its impacts on farming communities. Information about the impact of the infrastructure/asset interventions on the project objectives, output and outcome, reasons for delayed implementation, etc., was collected from infrastructure/asset beneficiaries. Information was also collected about the trainings, employment generation,

marketing details, constraints faced under RKVY, sources of funds, opinion of beneficiaries about RKVY, changes suggested by beneficiaries and benefits availed under other government schemes by RKVY beneficiaries.

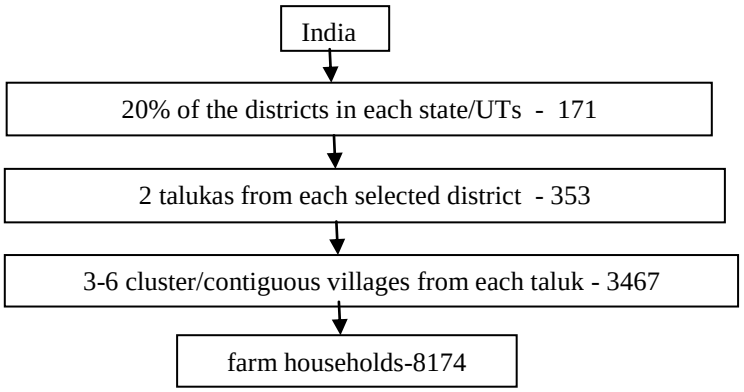


**Figure 1.1: Schematic representation of sampling framework**

## 1.5 Limitations

The secondary data available in the RDMIS website of RKVY is not adequate and meaningful to make effective analysis of the programme. Firstly, year wise data for several parameters was neither available on the website nor was received from any State. Secondly, the allocation and expenditure data provided by the Ministry of Agriculture and Cooperation, Government of India for the States and the data provided by RDMIS website does not concur with each other. A possible explanation for this could be that the expenditure shown in the website might have been repeated as the same projects and are repeated in several years. Thirdly, the data provided by the ministry on releases for the States in most cases shown as utilization and expenditure. This is not the case in website data. The website data only shows the expenditure, not the release. A few states have provided the release data now; this data is same as expenditure data. Fourthly, as the number of projects reported is repeated and hence the number of individual projects are higher as compared to the actual projects. Finally, the physical targets and achievement data are not properly entered. In many cases, the targets, achievements, expenditure data is not available.

The current report is based on the primary data collected from the farm household and infrastructure/asset beneficiaries pertaining to the 11th Five Year Plan across states and UTs. The report mostly relies on data collected through interview using pre-tested questionnaires. Some quantity of recall bias is bound to be associated with the collection of data since the farmers have not maintained any record of cultivation expenses, application of inputs or returns. However, efforts were made to minimize the error through cross checks at the time of data collection. Due to limited time, the research study is restricted to only limited number of Infrastructure/asset beneficiaries.

## 1.6 Structure of the Report

This report is outlined into 7 chapters: First chapter focuses on the background information about the RKVY program, followed by the details of data, methodology and limitation of the study. Second chapter presents the agricultural economy of the sample farm household

beneficiaries encompassing age, sex, caste, education status, family size, occupation, income, land holding, cropping pattern, irrigation sources and livestock and assets details. Additionally, awareness of beneficiaries about RKVY was included in this chapter. Third and fourth chapters discuss the analysis of major and minor sectors. Major sectors covered includes Agricultural Mechanization, Animal Husbandry, Crop Development, Horticulture, Micro/Minor irrigation, whereas minor sector covered includes NRM, Organic Farming, Fisheries, Sericulture, IPM, Cooperatives/cooperation. In these two chapters, details about the interventions and its costs and subsidies, usage of the intervention/benefit and its impacts on farming communities specifically productivity and income is elaborately discussed. Fifth chapter presents the other miscellaneous information about the sample farm households, which includes Trainings, Employment generation, Marketing details, Constraints faced under RKVY scheme, Sources of funds, Opinion of beneficiaries about RKVY, Changes suggested by beneficiaries and Benefits availed under other government schemes by RKVY beneficiaries. A complete chapter six is devoted to present the results of the infrastructure/ asset beneficiaries. In this chapter, impact of the interventions on the project objectives, output and outcome, reasons for the delay in implementation and abandoned projects, etc. are discussed in-details. Final chapter offers conclusions and policy implications drawn from the primary data analysis (both farm household and infrastructure/asset beneficiaries).

Table 1.2: Details of the selected numbers of farm and infrastructure beneficiaries

| Region | State | No. of Farm HH beneficiaries | No. of infrastructure/asset beneficiaries |
|---|---|---|---|
| Southern Region | Andhra Pradesh | 250 | 28 |
| | Goa | 100 | 12 |
| | Karnataka | 311 | 73 |
| | Kerala | 250 | 39 |
| | Tamil Nadu | 300 | 60 |
| | Puducherry | 100 | 16 |
| | A & N Islands | 150 | 6 |
| | **SOUTH TOTAL** | **1461** | **234** |
| West and Central India | Chattishgarh | 250 | 21 |
| | Gujarat | 422 | 53 |
| | Madhya Pradesh | 500 | 8 |
| | Maharashtra | 350 | 44 |
| | Rajasthan | 358 | 35 |
| | **CENTRAL TOTAL** | **1880** | **161** |
| East and North East India | Arunachal Pradesh | 225 | 4 |
| | Assam | 209 | 4 |
| | Bihar | 400 | 0 |
| | Jharkhand | 250 | 0 |
| | Manipur | 233 | 0 |
| | Meghalaya | 124 | 4 |
| | Mizoram | 243 | 0 |
| | Nagaland | 169 | 82 |
| | Orissa | 300 | 63 |
| | Sikkim | 200 | 0 |
| | Tripura | 180 | 3 |
| | West Bengal | 250 | 21 |
| | **EAST TOTAL** | **2783** | **181** |
| North and North Western India | Haryana | 250 | 19 |
| | Himachal Pradesh | 250 | 80 |
| | Jammu and Kashmir | 250 | 124 |
| | Punjab | 250 | 21 |
| | Uttar Pradesh | 800 | 20 |
| | Uttarakhand | 250 | 16 |
| | **NORTH TOTAL** | **2050** | **280** |
| | **ALL INDIA** | **8174** | **856** |

Source: Our Primary survey

# Chapter 2

## Socio Economic Characteristics, Cropping Pattern and Value of Output of the Sample Household

### 2.1 Introduction

The main objective of this study is to examine the extent to which the components and activities under the RKVY have actually met or/are meeting their stated targets (objectives) for improving agricultural productivity, production and enhancing economic conditions of the farmers. The thrust of the study is to evaluate the impact of various schemes under RKVY; the manner in which the schemes were implemented and how and to what extent they contributed in improving economic condition of the farmers. To perceive the pulse at the field and to interact with farmers to find out their views and perceptions, a detailed household survey was carried out across all the states and few Union Territories where RKVY programme was implemented. At the first stage, 20 per cent districts were selected in all the states based on the information provided by the nodal officer of RKVY in Agriculture and other related Departments in all the states. In smaller states a minimum of 5 districts or whole state was selected if the state consisted of fewer than 5 districts. At the second stage, Two taluks from each selected district after ascertaining from the nodal officers that all the sectors and activities get represented in the sample were selected based on the RKVY works carried out in different taluks. At the third stage, a group of contiguous villages or cluster of villages were selected from each taluk to collect primary data from 25 beneficiary households.

For the selection of households, a beneficiary list of the households was obtained from the nodal officer or the concerned departments who had carried out the RKVY intervention. While selecting the households, care was taken to give due representation to all major and minor sectors and particular attention was paid to also capture the household investment made in infrastructure through RKVY subsidy scheme such as investment in irrigation, horticulture, watershed, organic farming and so on. In the household selection, appropriate representation was given to all the major as well as minor sectors and all activities related to agriculture as well as other allied activities, like animal husbandry, fishery, sericulture, information technology and so on. It is to be mentioned here that the above methodology was followed for the household sample survey. A separate survey has been carried out for the infrastructural activities, the methodology for the same along with the findings are discussed in Chapter 6. This chapter presents general overview of the selected households, their socio economic characteristics, occupation structure, holding size, cropping pattern, crop productivity and income structure of the selected respondents. The further details about RKVY activities, the subsidy pattern and impact of RKVY is discussed in the next chapter onwards.

### 2.2 Selected Sample and Their Socio-economic Profile

For the sake of convenience, the country has been divided into four regions namely, North; Central and West; East and North-east and South covering all the 28 states falling in these four

regions. In addition, Union Territories, viz., Puducherry and Andaman Nicobar are also covered in the South region. Tables 2.1 presents the numbers of districts, taluks, villages and beneficiaries selected across four regions mentioned above. A total number of 171 districts and 353 taluks were covered in the sample across the country. The numbers of villages surveyed exceeded 3 thousand whereby on average, around 19 villages per district or 9-10 villages in each taluk were surveyed to draw the sample of 25 beneficiaries from each taluk. It implies that on average only 2 to 3 beneficiary farmers were surveyed in each village as the RKVY activities were too sparse and the main target was to cover all the activities undertaken in the programme. In many cases especially related to infrastructural activities like establishment of poly or green house, shade net, micro/minor irrigation, organic unit and a dairy or poultry house, there was only one beneficiary in a village and to cover the same our team visited the village to cover that particular beneficiary household. Total beneficiary households surveyed aggregated at 8174 out of which highest 34 per cent belonged to east and north east, the region that also contains highest number of 12 states, followed by north 25 per cent, the region have total 6 states. The west and central region followed north with 23 per cent sample having mainly 5 states and south region that contains 4 south Indian states along with Goa and two Union Territories namely Puducherry and Andaman Nicobar consisted of around 18 per cent of the aggregate sample.

Table 2.1: Details of selected households across various regions

| State | No. of Districts Covered | No. of Taluks covered | No. of Villges Covered | No. of Beneficiaries Covered |
|---|---|---|---|---|
| South | 29 | 58 | 597 | 1461 (17.9) |
| West and Central | 38 | 75 | 602 | 1880 (23.0) |
| East and North-East | 63 | 138 | 1016 | 2783 (34.0) |
| North | 41 | 82 | 949 | 2050 (25.1) |
| All India | 171 | 353 | 3164 | 8174 (100.0) |

Annex Table 2.1A provides details of households selected in each state. As stated above in the larger states we selected 20 per cent of the districts and in smaller states we selected minimum 5 districts or all districts if the total numbers of districts was less than 5 in a state. The highest 16 districts were selected in Uttar Pradesh, 10 districts in Madhya Pradesh, 8 each in Bihar, Gujarat and Maharashtra, while rest of the states, 5-6 districts were selected. A total number of 800 beneficiary households were selected in Uttar Pradesh, 500 in Madhya Pradesh, around 400 in Gujarat, Maharashtra and Bihar each and around 250 to 350 households in most of the other states were selected. It is to be noted that the actual selection of household was tried with the original plan but in some cases where we did not get appropriate households in two taluks we selected three taluks also in few cases and in some cases numbers of households selected per taluk was slightly above or below 25 beneficiaries. These variations happened because the actual beneficiaries on the ground varied from what we planned in the beginning. Nevertheless, the sample remains representative and mostly as per our original plan as mentioned in TOR.

Table 2.2 presents sector wise numbers of beneficiary households selected in all the four regions. At the aggregate, the highest numbers of beneficiary surveyed belonged to crop development which along with seeds covered the maximum beneficiaries as has been described in our first report submitted to RKVY based on the website data. The numbers of beneficiaries surveyed were 2832 for crop development that was around 35 per cent of the total sample households. Agricultural mechanization was the next activity with sample size of 1710 that is 21 per cent of

the total sample followed by animal husbandry 1386 households that was 17 per cent of the sample, horticultural infrastructure and horticulture crop development together represented 24 per cent and minor and micro irrigation represented 14 per cent of the total sample. All the above mentioned activities were clubbed under major activities. The remaining activities that had less amount of money spent and thereby had less representation in our sample were clubbed together into the minor activities. These minor activities included fisheries accounting for 7 per cent of our selected sample followed by organic farming and natural resource management (NRM) both 5 per cent, while the remaining activities like integrated pests management, sericulture and cooperatives and cooperation included less than 1 per cent of the sample. Region wise details are given in Table 2.2 and state wise details are provided in Annex Table 2.2A.

Table 2.2: Sector-wise details of selected households (No. of beneficiaries)

| State | | Agriculture mechanisation | Animal husbandary | Fisheries | Crop development | Horticulture (infrastructure) | Horticulture (crops) | Integrated pest management | Micro / minor irrigation | Natural resource management | Organic farming / bio-fertilizers | Sericulture | Cooperatives and cooperation | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South | | 390 | 372 | 55 | 354 | 139 | 299 | 0 | 120 | 28 | 51 | 0 | 34 | 1842 |
| West and Central | | 494 | 188 | 70 | 567 | 137 | 169 | 0 | 579 | 237 | 61 | 8 | 12 | 2522 |
| East and North-East | | 514 | 404 | 296 | 1546 | 310 | 391 | 36 | 202 | 58 | 107 | 32 | 40 | 3936 |
| North | | 312 | 422 | 177 | 365 | 126 | 431 | 0 | 264 | 59 | 197 | 19 | 7 | 2379 |
| All India | Numbers | 1710 | 1386 | 598 | 2832 | 712 | 1290 | 36 | 1165 | 382 | 416 | 59 | 93 | 10679 |
| | % to sample beneficiaries | (20.9) | (17.0) | (7.3) | (34.6) | (8.7) | (15.8) | (0.4) | (14.3) | (4.7) | (5.1) | (0.7) | (1.1) | (130.6) |

Note: Some beneficiaries are benefitted in more than one sector. Hence, the total exceeds the sample size

The demographic profile of households indicates their socio-economic characteristics. Tables 2.3 to 2.8 present demographic profiles of the selected beneficiary households by different regions. It is apparent from the statistics that household size varied from 5.8 members in the southern region to 7.2 in the west and central region while north region with 7.1 and east and north-east region with 6.4 members lied in the middle and at the aggregate the average family size was 6.7 members per family. Among different states, the highest family size was recorded in the case of Andaman Nicobar that had average size of 10 members per family. The lowest family size was also recorded in the southern region, in Andhra Pradesh with average of 4.5 members per family. In most of the states family size varied between 5 members to 7 members (Annex Table 2.6A). Further, out of 6.7 members per family around 2.6 and 2.4 were adult male and adult female, respectively and 1.7 members belonged to the children age of less than 15 years. Looking at the age structure of the registered beneficiaries whose name the subsidy was given to the households, a majority of them (50 per cent) were in the middle age of 40 to 60 years, 16 per cent were towards old age of above 60 years and a significant 34 per cent were in the young age of less than 40 years (Table 2.4). More or less, the same trend was followed in all the states and regions as is also apparent from Figure 2.1). As an exception, in Goa, Kerala and Gujarat states, senior citizen beneficiaries (above 60 years) were about a quarter of their respective sample beneficiaries (Annex Table 2.3A). The ratio towards gender was clearly in favour of male where 85 per cent of the beneficiaries were male and only 15 per cent were female. The female ratio was even lower than aggregate in the north region (only 10.6 per cent) while their ratio was highest in the south (19 per cent). It was exceptionally low in Jammu and Kashmir and Assam, only 2 per cent each.

Table 2.3: Details of family size of sample beneficiaries (Numbers)

| Particulars | South | West and Central | East and North-east | North | All India |
|---|---|---|---|---|---|
| Total Family Size | 5.8 | 7.2 | 6.4 | 7.1 | 6.7 |
| Male above 15 years | 2.3 | 2.7 | 2.5 | 2.8 | 2.6 |
| Female above 15 years | 2.3 | 2.5 | 2.3 | 2.4 | 2.4 |
| Children below 15 years | 1.3 | 2.0 | 1.7 | 1.9 | 1.7 |

Table 2.4: Age and Gender classification of sample beneficiaries
(Percentage to total sample)

| State | Age group | | | | Gender | | |
|---|---|---|---|---|---|---|---|
| | Below 40 Years | Between 40 to 60 Years | Above 60 years | Total | Male | Female | Total |
| South | 28.2 | 54.0 | 17.8 | 100.0 | 81.1 | 18.9 | 100.0 |
| West and Central | 29.4 | 52.6 | 18.1 | 100.0 | 85.4 | 14.6 | 100.0 |
| East and North-East | 41.8 | 46.9 | 11.4 | 100.0 | 82.8 | 17.2 | 100.0 |
| North | 30.2 | 50.9 | 18.9 | 100.0 | 89.4 | 10.6 | 100.0 |
| All India | 33.6 | 50.5 | 15.9 | 100.0 | 84.7 | 15.3 | 100.0 |

Table 2.5: Classification of beneficiaries based on caste (Percentage to total sample)

| Region | SC | ST | OBC | Others | Total |
|---|---|---|---|---|---|
| South | 8.5 | 10.0 | 36.1 | 45.4 | 100.0 |
| West and Central | 8.9 | 12.1 | 39.5 | 39.5 | 100.0 |
| East and North-East | 10.6 | 39.6 | 29.8 | 20.0 | 100.0 |
| North | 9.7 | 7.0 | 11.3 | 72.1 | 100.0 |
| All India | 9.6 | 19.8 | 28.5 | 42.1 | 100.0 |

Table -2.6 Classification of sample beneficiaries based on education status
(Percentage to total sample)

| Region | Illiterate | Primary | Middle | Matriculate | Higher Secondary | Degree and above | Total |
|---|---|---|---|---|---|---|---|
| South | 14.4 | 17.4 | 20.1 | 27.4 | 10.0 | 10.9 | 100.0 |
| West and Central | 19.9 | 19.6 | 20.9 | 18.1 | 11.6 | 9.9 | 100.0 |
| East and North-East | 17.8 | 13.6 | 25.3 | 23.9 | 10.8 | 8.7 | 100.0 |
| North | 16.9 | 12.9 | 18.4 | 23.0 | 14.3 | 14.5 | 100.0 |
| All India | 17.5 | 15.5 | 21.6 | 23.0 | 11.7 | 10.8 | 100.0 |

Table 2.7: Occupation details of sample beneficiaries

| Region | Occupation of beneficiaries (per cent of total) | | | | |
|---|---|---|---|---|---|
| | Agriculture and allied activities | Self business | Service | Other activities | Total |
| South | 94.2 | 0.8 | 2.3 | 2.7 | 100.0 |
| West and Central | 88.9 | 3.3 | 7.3 | 0.5 | 100.0 |
| East and North-East | 79.3 | 6.4 | 6.9 | 7.4 | 100.0 |
| North | 75.5 | 6.7 | 12.1 | 5.7 | 100.0 |
| All India | 83.2 | 4.8 | 7.5 | 4.5 | 100.0 |

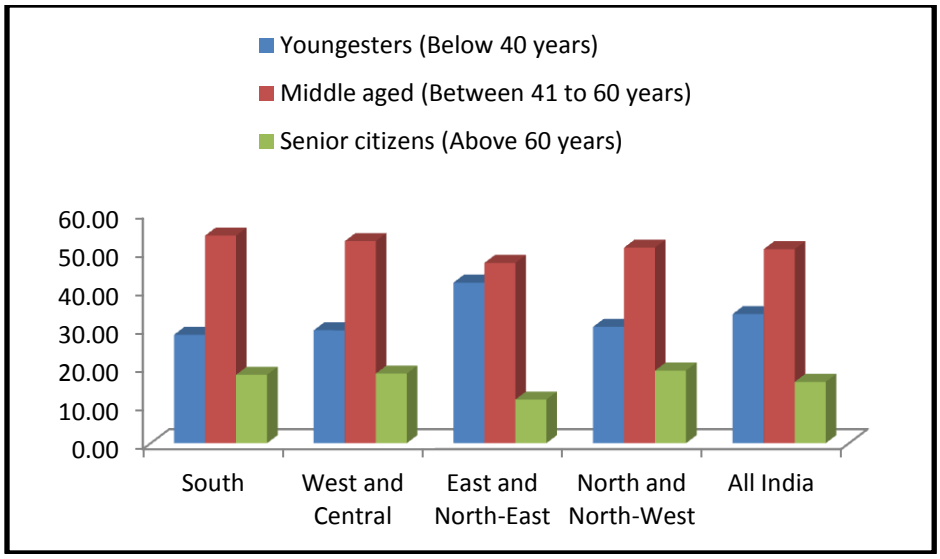


Figure 2.1: Distribution of respondents by age profile

It is mandatory for any government sponsored rural development programmes to extend benefits to stake holders belonging to Schedule Castes and Scheduled Tribes. Since RKVY is no exception, the survey also collected details related to caste of beneficiaries to just have some approximate idea on the proportion of SC/STs covered under RKVY programme. It is clear from the statistics in Table 2.5 that the share of SC and ST households among our selected sample was nearly 30 per cent. All the regions are found to have covered SC/STs exceeding 15 per cent of their respective sample size. Though southern region covered about 18 per cent of SC/STs, the two major states of Tamil Nadu (9.67 per cent) and Kerala (5.6 per cent) had less number of SC/ST beneficiaries. However, more than 50 per cent of Other Backward Caste (OBC) households consisted of total sample in Tamil Nadu and 22 per cent in Kerala.

In the west and central region, SC and STs consisted of 20 per cent of the total sample while OBC had more than 50 per cent share. SC/ST proportion to the total sample was low in Gujarat and Maharashtra (less than 15 per cent) while ST proportion in the sample was 34 per cent in Chhattisgarh. General category consisted of around 50 per cent in Gujarat and Maharashtra while same proportion was that of OBC in Rajasthan. In the east and north-east region, ST households alone constituted around 40 per cent of the total sample and along with SC households their proportion was almost 50 per cent in the total sample. Out of twelve states in the region, three states, viz., Meghalaya, Mizoram and Nagaland have more than 95 per cent ST population as per 2011 Census data. Therefore, almost all the respondents in these three states were from ST category while same was the case with Arunachal Pradesh as well. In other north-eastern states, by and large, 50 per cent of survey respondents belonged to SC/ST category, except that of Assam where around 25 per cent households belonged to this category. In other eastern states namely, Bihar their representation was only 5 per cent while in Jharkhand and Orissa their proportion was 25 per cent and in West Bengal SC and ST households constituted around 50 per cent of the sample. In the northern region, the predominant share of the sample belonged to General category households, above 70 per cent. SC proportion was highest in Himachal Pradesh 41 per cent while ST proportion was 13 per cent in Uttar Pradesh and OBC proportion more or less was 10 to 15 per cent in all the states. In Punjab and Haryana, only 5 per cent selected

beneficiaries belonged to SC/ST groups. Overall, the selected sample is a good balance of all social classes and indicates due representation of all classes in the RKVY programme.

Data pertaining to educational standards of sample beneficiaries is shown in Table 2.6. Among the sample households, illiterate beneficiaries were 17 per cent at the aggregate. Lowest proportion of 14 per cent illiterates was in southern region and highest 20 per cent was in central and west region. In the southern region, a negligible fraction of 1.2 per cent beneficiaries were illiterates in Kerala followed by 5 per cent in Tamil Nadu, 7 per cent in Goa and 9 per cent in Puducherry (Annex Table 2.5A). In the west and central, Maharashtra had 13 per beneficiaries illiterate and Gujarat had 17 per cent while Chhattisgarh had highest 26 per cent beneficiaries illiterate. East and north-east region had 18 per cent beneficiaries illiterate. The lowest number was in Mizoram and Manipur having 7 per cent households illiterate while Nagaland and Jharkhand both had highest percentage of illiterates whereby every fourth beneficiary household was found illiterate. In the north region proportion of illiterates in the sample was around 17 per cent. The lowest numbers of illiterates were in Uttrakhand and Punjab less than 10 per cent whereas Uttar Pradesh had 22 per cent beneficiaries illiterate and Jammu and Kashmir had 20 per cent beneficiaries illiterate. The illiterate beneficiaries are amenable to be managed easily by the authorities as they are mostly dependent for availing subsidy benefits that requires a lot of paper work.

At all aggregate, around 15 per cent beneficiaries were literate up to primary standard, 22 per cent were up to middle and 23 per cent were educated up to secondary level. The beneficiaries who had studied up to higher secondary or +2 were 12 per cent and only around 10 per cent were graduate or above. The beneficiaries educated up to higher secondary and graduate topped in the north, whereas beneficiaries up to secondary standard were highest in the south. Qualified beneficiaries with a degree or above were highest in Manipur and Haryana around 20 per cent, followed by Bihar, Goa, Tamil Nadu and Punjab, between 15 to 20 per cent. Except for west and central region, sample of all regions showed the same pattern of education. Puducherry claimed top position with more than 61 per cent of its sample size having an educational level between matriculation and higher secondary. On the other hand, the sample size in this category of education was less than 15 per cent in Arunachal Pradesh and Nagaland in the east and north-eastern region.

Looking at the occupation details of the selected beneficiary households (Table 2.7), more than 80 per cent of the beneficiaries had their main occupation as agriculture and allied activities. Only 5 per cent were engaged in self business and 7.5 per cent had their main occupation in the service sector while rest of the beneficiaries had other than the above mentioned activities as their main occupation. Across various regions, agriculture was the main occupation for almost 95 per cent of the beneficiaries in the south, 90 per cent in the west, 80 per cent in the east and 75 per cent in the north. In Karnataka, Tamil Nadu, Puducherry, Rajasthan and West Bengal, almost all the beneficiary households had agriculture and allied activities as their main occupation. On the other extreme, more than half of the beneficiaries in Uttrakhand and almost half in Himachal Pradesh were not engaged in agriculture or allied activities and had their main occupation as business or service sector (Annex Table 2.6A).

## 2.3 Land Holding details of Beneficiary Households

RKVY programme is implemented mainly for agriculture and allied activities and thereby the beneficiaries were mostly cultivators. However, among our selected households some beneficiaries did not own any land and were cultivating land through tenancy, besides some beneficiary belonged to allied activities like animal husbandry, fishery etc. Table 2.8 shows that at the aggregate, around 6 per cent beneficiaries were those who did not own any land. The ratio was highest 10 per cent in the south, 7 per cent in the east and north-east, 3.5 per cent in the west and central and less than 3 per cent in the north. In Andaman Nicobar around 37 per cent beneficiaries did not own any land, followed by Meghalaya 32 per cent, Puducherry 29 per cent and West Bengal 17 per cent (Annex Table 2.7A). Per household owned area among the selected beneficiaries averaged at 6.06 acres while the operated area was 6.08 acres where the difference accounted for the land under tenancy. The leased-in land exceeded the leased-out land in all the regions and at the aggregate except the case of east and north-east.

Table 2.8: Land holding details of sample beneficiaries

| Region | Beneficiaries owning Land (%) | Total Owned land area per HH in Acres | Per household operational area in acres | | | Cropping intensity |
|---|---|---|---|---|---|---|
| | | | Irrigated | Un-irrigated | Total | |
| South | 89.9 | 7.2 | 5.2 | 2.3 | 7.5 | 1.2 |
| West and Central | 96.5 | 8.1 | 7.3 | 1.0 | 8.3 | 1.5 |
| East and North-East | 93.0 | 4.7 | 2.8 | 0.8 | 3.6 | 1.4 |
| North | 97.2 | 5.2 | 6.1 | 0.2 | 6.3 | 1.8 |
| All India | 94.3 | 6.1 | 5.1 | 1.0 | 6.1 | 1.5 |

The average net operated area was highest 8.3 acres in the west and central region, followed by 7.5 acres in south; 6.3 acres in the north while the operated area was lowest 3.6 acres in the east and north-east region among the selected households. The cropping intensity among the beneficiaries, on the other hand, was highest 1.8 in north followed by west and central 1.5, east and north-east, 1.4 and lowest 1.2 in the south. The lowest cropping intensity in the south was probably due to highest un-irrigated area in the south as out of 7.5 acres of operated area 2.3 acres were un-irrigated in south that is around 31 per cent. In Comparison, in the east and north-east 22 per cent area was un-irrigated, in the west and central 12 per cent area was un-irrigated and in the north, only 3 per cent area was un-irrigated among the selected households. The cropping intensity approached two in most of the states in the north, viz., Punjab, Haryana, Uttrakhand, Jammu and Kashmir and Himachal Pradesh. It was closer to one in most of the north-eastern states and in the southern states while it was around 1.5 in the west and central Indian states (Annex Table 2.7A).

Table 2.9 presents sources of irrigation among the selected beneficiary households. The main source of irrigation in all the regions was ground water that was fetched either through the open well or by the tube well while surface water accounted for less than one fifth of the area irrigated. At the aggregate, the highest 63 per cent area was irrigated by tube well, followed by canal around 17 per cent, open well around 11 per cent and tanks and others contributed less than 10 per cent of the remaining irrigated area. Among different regions, tube well was the main source of irrigation in the north India where it accounted for around 80 per cent of the total irrigated area while open wells accounted highest area of more than 20 per cent in the west and central and 18 per cent area in the south region. Canal and tank dominated in the east and north-

east region where surface water accounted for around 30 per cent irrigated area. Similar trends are also observed among different states (Annex Table 2.8A). Tube well irrigated more than 80 per cent area in Punjab, Haryana, Uttar Pradesh, Bihar, Andhra Pradesh and Puducherry and above 50 per cent but less than 80 per cent in Chhattisgarh, Gujarat, Madhya Pradesh, Rajasthan and West Bengal. Open well accounted for above 50 per cent irrigated area in Kerala, Tamil Nadu and Maharashtra. The share of canal was around or above 50 per cent in the total irrigated area in Andaman Nicobar, Manipur, Nagaland and Orissa, while tanks/ponds irrigated around 70 per cent area in Sikkim, around 30 per cent area in Himachal Pradesh and around 25 per cent area in Mizoram and Jharkhand.

Table 2.9: Sources of Irrigation (percentage of area irrigated)

| Region | Open well | Tube well | Canal | Tank | Others |
|---|---|---|---|---|---|
| South | 18.3 | 52.9 | 23.0 | 1.0 | 4.8 |
| West and Central | 21.8 | 60.6 | 14.6 | 1.1 | 1.9 |
| East and North East | 7.9 | 44.5 | 21.7 | 8.4 | 17.5 |
| North | 0.3 | 78.1 | 14.2 | 2.4 | 5.0 |
| All India | 10.8 | 63.1 | 16.9 | 2.9 | 6.3 |

In the previous analysis we have seen the socio economic background of the beneficiaries of the RKVY programme. In order to provide further insights, we divided our selected sample into four categories based on the operational area by the selected households. The households are divided into marginal farmers operating less than 2.5 acres of land, small farmers operating 2.5 to 5.0 acres, medium farmers operating 5.0 to 10.0 acres and large farmers operating above 5.0 acres of land. As mentioned above in addition to cultivators and tenants households, our sample also includes households who did not operate any land and they fall in the category of allied activities like animal husbandry, dairy, poultry, fishery etc. Table 2.10 provides details of beneficiary distribution by farm size holdings.

Table 2.10: Distribution of beneficiaries by farm size holdings (Percentage)

| Region | Marginal | | Small | | Medium | | Large | | Non cultivators |
|---|---|---|---|---|---|---|---|---|---|
| | No. | Area | No. | Area | No. | Area | No. | Area | No. |
| South | 32.4 | 6.6 | 27.1 | 15.7 | 17.3 | 19.8 | 14.5 | 58.0 | 8.7 |
| West and Central | 19.0 | 4.1 | 31.6 | 15.3 | 22.1 | 20.8 | 23.6 | 59.8 | 3.7 |
| East and North East | 49.3 | 21.8 | 24.2 | 27.1 | 10.6 | 24.3 | 4.4 | 26.8 | 11.5 |
| North | 41.3 | 9.1 | 24.0 | 15.0 | 17.5 | 22.2 | 15.0 | 53.6 | 2.2 |
| All India | 37.3 | 9.5 | 26.4 | 17.7 | 16.2 | 21.7 | 13.3 | 51.2 | 6.8 |

The uneven distribution of land across various farm size holdings is clearly visible from the statistics presented in the table. At the aggregate, 37 per cent holdings fell in the category of marginal farmers and 26 per cent in small farmers. Thus, around 64 per cent of beneficiary households operated less than 5 acres per household area and the proportion of area these households cultivated was only 27 per cent. On the other extreme, 13 per cent households operated more than 10 acres per household area and they occupied more than 50 per cent share of the total area. The households operating 5 to 10 acres of land occupied 16 per cent share in the holdings and 22 per cent share in the cultivated area. Among different regions, the highest numbers of marginal holdings (less than 2.5 acres operated area) was in the east and north-east around 50 per cent, cultivating around 22 per cent area whereas in the north their number was 41

per cent but they cultivated only 9 per cent area and in the west marginal holdings was 19 per cent but cultivated area share was only 4 per cent. Looking at the large holdings of above 10 acres, their number was least in east and north-east only 4 per cent occupying 27 per cent area. In the north and south, on the other hand, their number was around 15 per cent but they occupied more than 50 per cent area. In the west their share in numbers of holdings was 24 per cent but share in cultivated area was 60 per cent. In the middle, Small holdings (2.5 to 5.0 acres) occupied around 25 per cent share in holdings and around 15 per cent share in the area cultivated in most of the regions. Similarly, medium holdings (5.0-10.0 acres) occupied around 15 per cent share in holdings and around 20 per cent share in area.

Among different states (Annex Table 2.9A), the numbers of marginal holdings was highest in Kerala around 84 per cent followed by Uttrakhand 79 per cent, Himachal Pradesh, Sikkim and Arunachal Pradesh all 73 per cent, Manipur 63 per cent, West Bengal 60 per cent, Jharkhand 59 per cent and Nagaland and Mizoram both 55 per cent. The area under marginal holdings was also high in Kerala 63 per cent, Arunachal Pradesh 76 per cent and Meghalaya 60 per cent. On the other extreme, large holdings were highest in Punjab 44 per cent, followed by Rajasthan 36 per cent, Karnataka and Haryana both 32 per cent, Gujarat 30 per cent and Goa 28 per cent. Large holdings occupied 76 per cent area in Goa, 75 per cent in Punjab, 74 per cent in Karnataka, 69 per cent in Haryana, 66 per cent in Puducherry, 63 per cent in Gujarat, 54 per cent in Madhya Pradesh and 51 per cent in Maharashtra. Against these trends, large holdings were non- existent in Nagaland, Meghalaya, Arunachal Pradesh and Kerala and almost negligent in Himachal Pradesh, Uttrakhand, Mizoram, Sikkim, Manipur and West Bengal.

## 2.4 Livestock and Farm Assets

Animal husbandry is the integral part of Indian agriculture. Livestock raring are not only additional source of earnings but they are also a major source of energy for the agriculture sector. Farmers keep cattle, bovine and poultry animals not only for milk, eggs, meat and wool purpose but they are also a major source of drought power for the cultivation and transportation. The livestock reared by our selected beneficiary households are categorized into cow, buffalo, sheep, goat, pig, poultry and drought animals. Table 2.11 provides details of livestock holdings by the selected households. On average, households reared around one cow buffalo and sheep/goat and the average value of all livestock was Rs 76 thousand per household. The value of cows averaged at Rs 37 thousand per household, buffaloes Rs 22 thousand per household, sheep and goat Rs 3 thousand per household, pig above Rs 1.5 thousand per household and poultry less than Rs one thousand per household. Among different regions, the value of total livestock varied from Rs 36 thousand per household in the east and north-east, Rs 57 thousand per household in the south, Rs 76 thousand per household in the west and central and Rs 1.4 lakh per household in the north region. The value of cows reared averaged at Rs 74 thousand in the north, Rs 35 thousand in the south, Rs 25 thousand in the west and central and Rs 19 thousand in the east and north-east. Similarly, value of buffaloes averaged at Rs 47 thousand in the north, Rs 34 thousand in the west and central, Rs 11 thousand in the south and less than Rs 2.5 thousand in the east and north-east. The households owned male drought whose value averaged at Rs 4 thousand per household and it was highest in the north Rs 4 thousand and lowest Rs 1.5 thousand in the south. Unlike, cows and buffaloes, the piggery and poultry value was highest Rs 4 thousand and Rs 1.7 thousand per household, respectively in the east and north east.

Table 2.11: Livestock holding by sample households (per household)

| Livestock details | | South | West and Central | East and North East | North | All India |
|---|---|---|---|---|---|---|
| Cow | No | 1.5 | 1.5 | 1 | 2 | 1.4 |
| | Value | 34367 | 24776 | 19198 | 74334 | 37020 |
| Buffalo | No | 0.4 | 1.1 | 0.1 | 1.3 | 0.7 |
| | Value | 10933 | 34114 | 2462 | 47056 | 22440 |
| Young stock | No | 1 | 1.3 | 0.5 | 1.9 | 1.1 |
| | Value | 4938 | 4659 | 2865 | 12326 | 6021 |
| Male Drought | No | 0.2 | 0.6 | 0.3 | 0.4 | 0.4 |
| | Value | 1511 | 7866 | 3570 | 4247 | 4359 |
| Sheep | No | 0.3 | 0.2 | 0.1 | 0.5 | 0.2 |
| | Value | 981 | 565 | 126 | 1815 | 803 |
| Goat | No | 0.7 | 0.7 | 0.7 | 0.6 | 0.7 |
| | Value | 2796 | 2628 | 2002 | 2450 | 2400 |
| Pig | No | 0.2 | 0 | 0.5 | 0.3 | 0.3 |
| | Value | 725 | 64 | 4195 | 825 | 1780 |
| Poultry | No | 2.3 | 1.3 | 4.5 | 1.5 | 2.6 |
| | Value | 453 | 550 | 1711 | 467 | 907 |
| Others | No | - | - | - | - | - |
| | Value | 39 | 645 | 121 | 342 | 282 |
| Total | No | - | - | - | - | - |
| | Value | 56742 | 75867 | 36251 | 143861 | 76013 |

Looking at the state wise livestock holding among our selected households, the highest value of livestock holding per household was observed in Punjab Rs 6.25 lakh, followed by Goa Rs 2 lakh, Haryana Rs 1.8 lakh, Rajasthan Rs 1 lakh, Gujarat Rs 98 thousand, Jammu and Kashmir Rs 97 thousand, Puducherry Rs 81 thousand, Jharkhand Rs 73 thousand and Andhra Pradesh Rs 71 thousand per household (Annex Table 2.10A). The lowest amount of livestock holding was observed in Kerala only Rs 13 thousand per household and Tripura Rs 15 thousand per household. By and large livestock holding was highest in the north India and lowest in the north-east. The numbers of cows reared were highest in Punjab around 9 cows per household, followed by Goa where their numbers averaged at 5 and in Tamil Nadu, Puducherry, Chhattisgarh, Jharkhand and Haryana their numbers averaged at 2 cows per household. The buffalo rearing was also highest in Punjab followed by Haryana, Rajasthan, Gujarat, Madhya Pradesh, Uttar Pradesh and Andhra Pradesh. Their numbers averaged at 2 in Punjab and Haryana while in the other states mentioned above their number averaged at 1 buffalo per household. Sheep numbers were highest in Jammu and Kashmir while goat was in Uttrakhand and Tamil Nadu and piggery was more reared in the north-east.

Table 2.12 presents farm asset holdings among our selected households. Just like livestock holdings, value of farm assets was also highest in the north India and lowest in the east and north-east. The aggregate value of farm assets was found almost Rs 3 lakh per household in the north, Rs 2.7 lakh in the west and central, Rs 1.5 lakh in the south and slightly above Rs 61 thousand per household in the east and north-east. The value of farm assets per household was that of tractor Rs 71 thousand, followed by cattle shed Rs 32 thousand, tractor implements and electric pump sets Rs 23 thousand each while all other assets were in the range of Rs 5 thousand per household or less than that. The other implements owned by the selected households

included trolley, weeder, sprayer, thresher, sprinkler and drip irrigation equipments, fodder chopper, bullock cart and agro processing equipments like rice flour mill and cane crusher.

Table 2.12: Farm assets holding by sample households (per household)

| Farm Assets | | South | West and Central | East and North East | North | All India |
|---|---|---|---|---|---|---|
| Tractor | No. | 0.2 | 0.4 | 0.1 | 0.4 | 0.2 |
| | Value (Rs.) | 53165 | 116140 | 22770 | 107975 | 71047 |
| Trolley | No. | 0.1 | 0.7 | 0.2 | 0.6 | 0.4 |
| | Value (Rs.) | 9364 | 35809 | 11258 | 36988 | 23019 |
| Weeder | No. | 0.1 | 4.9 | 3 | 6.7 | 3.8 |
| | Value (Rs.) | 1401 | 1814 | 736 | 5829 | 2380 |
| Manual / Power Sprayers | No. | 0.3 | 0.5 | 0.3 | 0.6 | 0.5 |
| | Value (Rs.) | 2011 | 24277 | 545 | 1862 | 6596 |
| Threshers | No. | 0 | 0.2 | 0.1 | 0.1 | 0.1 |
| | Value (Rs.) | 1737 | 7355 | 1817 | 6655 | 4290 |
| Electrical Pumpsets | No. | 0.6 | 0.6 | 0.1 | 0.4 | 0.4 |
| | Value (Rs.) | 44236 | 23020 | 2220 | 35561 | 22876 |
| Diesel Pumpsets | No. | 0.1 | 0.2 | 0.3 | 0.3 | 0.2 |
| | Value (Rs.) | 1819 | 4396 | 3837 | 6802 | 4348 |
| Sprinkler sets / Drip Irrigation Equipments | No. | 0.4 | 0.9 | 0.1 | 0 | 0.3 |
| | Value (Rs.) | 8864 | 11150 | 1029 | 661 | 4665 |
| Cane Crusher / Agro-processing Equipments | No. | 0 | 0.1 | 0 | 0.1 | 0.1 |
| | Value (Rs.) | 1067 | 11415 | 521 | 1985 | 3491 |
| Rice flour mills | No. | 0 | 0.1 | 0 | 0.1 | 0.1 |
| | Value (Rs.) | 668 | 8165 | 199 | 1520 | 2446 |
| Fodder Choppers | No. | 0 | 0.2 | 0.1 | 0.7 | 0.3 |
| | Value (Rs.) | 614 | 1539 | 601 | 5612 | 2076 |
| Bullock cart | No. | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| | Value (Rs.) | 940 | 2402 | 1126 | 1428 | 1462 |
| Farm house (Cattle Shed) | No. | 0.2 | 0.6 | 0.6 | 0.9 | 0.6 |
| | Value (Rs.) | 14746 | 23028 | 13119 | 79518 | 32341 |
| Others | No. | 0.1 | 0 | 0 | 0.1 | 0.1 |
| | Value (Rs.) | 11337 | 2135 | 1031 | 2924 | 3602 |
| Total | No. | - | - | - | - | - |
| | Value (Rs.) | 151969 | 272645 | 60810 | 295320 | 184639 |

Among different states (Annex Table 2.11A) farm assets value was very high around Rs 9 lakh per household in Punjab, Rs 5 lakh in Gujurat and Haryana, Rs 3 lakh in Rajasthan and Jammu and Kashmir, Rs 2 lakh in Andhra Pradesh, Puducherry, Tamil Nadu and Uttar Pradesh and between Rs 1 to 2 lakh in Goa, Karnataka, Chhattisgarh, Madhya Pradesh, Maharashtra, Bihar and Orissa. The assets value was less than Rs 1 lakh in rest of the states and it was lowest in the north-eastern states where its value was less than Rs 5 thousand in Meghalaya, Nagaland and Arunachal Pradesh. In Punjab, almost every selected household owned a tractor and its value was highest Rs 2.8 lakh per household while it was around Rs 2 lakh in Gujarat and Haryana and around Rs 1.8 lakh in Rajasthan and Rs 1 lakh in Karnataka. Next to tractor was the ownership of electric pump set whose value varied from Rs 1.2 lakh in Andhra Pradesh, Rs 1.1 lakh in Punjab and above Rs 50 thousand in Haryana, Tamil Nadu, Puducherry and Jammu and Kashmir. Cattle shed also had high investment of Rs 3 lakh in Punjab but less than Rs 1 lakh in most of the other states. Thus, Punjab was a leading state in the ownership of livestock as well as in farm assets, followed by Haryana, Tamil Nadu, Puducherry, Goa and Uttar Pradesh.

## 2.5 Cropping Pattern

The cropping pattern provides us profile of crops grown by the households. RKVY programme provided subsidy to the households through crop development, agricultural mechanization, organic farming, micro and minor irrigation and under many other activities which were not targeted for any particular crop. Thus, most of the crops grown by the farmers including that of food grains, oilseeds, commercial crops, horticulture, plantation and other miscellaneous crops were covered under the programme. Thereby, the cropping pattern followed by the selected beneficiaries was not particularly affected by the RKVY programme. The cropping pattern followed by the selected households was in line with the cropping pattern trends available from the secondary sources and that of DES data. At the aggregate, around 27 per cent of the gross cropped area was under paddy, 20.5 per cent under wheat, less than 10 per cent under coarse cereals and around 6 per cent was under pulses (Table 2.13). Thus, around 63 per cent of the gross cropped area among the selected households was under food grain crops, which is closer to the all India percentage of food grains area. More than 10 per cent cultivated area was under oilseeds, 4 per cent under cotton and sugarcane each and around 13 per cent area was under horticultural crops while rest of around 5 per cent area was under other crops, like fodder, forest species etc.

Table 2.13: Cropping pattern among selected households (% to gross cropped area)

| Sr. No. | Crop | South | West and Central | East and North East | North | All India |
|---|---|---|---|---|---|---|
| 1 | Paddy | 30.6 | 12.6 | 50.3 | 26.0 | 27.2 |
| 2 | Wheat | 1.8 | 18.9 | 14.4 | 35.5 | 20.5 |
| 3 | Jowar | 2.9 | 2.2 | 0.1 | 1.7 | 1.8 |
| 4 | Bajra | 0.4 | 5.0 | 0.1 | 2.3 | 2.4 |
| 5 | Maize | 5.1 | 1.9 | 6.5 | 4.5 | 4.2 |
| 6 | Ragi | 1.3 | 0.0 | 0.0 | 0.0 | 0.2 |
| 7 | Minor Cereals | 0.0 | 0.6 | 0.1 | 0.8 | 0.5 |
| 8 | Tur | 0.8 | 0.9 | 0.2 | 0.4 | 0.6 |
| 9 | Gram | 0.0 | 6.0 | 0.8 | 1.1 | 2.4 |
| 10 | Other pulses | 8.5 | 2.4 | 2.3 | 1.8 | 3.2 |
| 11 | Groundnut | 5.2 | 3.1 | 0.3 | 0.0 | 1.9 |
| 12 | Sunflower | 1.2 | 0.0 | 0.6 | 0.1 | 0.4 |
| 13 | Soyabean | 1.7 | 12.2 | 0.0 | 0.0 | 4.2 |
| 14 | Rape & Mustard | 0.0 | 4.5 | 3.3 | 2.2 | 2.8 |
| 15 | Other Oilseeds | 2.0 | 2.8 | 0.3 | 1.0 | 1.6 |
| 16 | Cotton | 5.6 | 8.8 | 0.0 | 1.0 | 4.1 |
| 17 | Jute & Mesta | 0.0 | 0.0 | 0.5 | 0.0 | 0.1 |
| 18 | Sugarcane | 2.8 | 6.4 | 0.5 | 5.6 | 4.4 |
| 19 | Fruits | 6.6 | 2.5 | 3.7 | 2.4 | 3.4 |
| 20 | Vegetables | 8.6 | 4.2 | 10.6 | 8.3 | 7.5 |
| 21 | Flowers | 0.4 | 0.0 | 0.1 | 0.6 | 0.3 |
| 22 | Spices | 0.0 | 2.3 | 2.5 | 1.3 | 1.6 |
| 23 | Plantation | 0.5 | 0.1 | 2.1 | 0.0 | 0.5 |
| 24 | Fodder | 0.4 | 1.5 | 0.0 | 2.7 | 1.4 |
| 25 | Forest species | 0.1 | 0.0 | 0.2 | 0.0 | 0.1 |
| 26 | Others | 13.5 | 1.1 | 0.5 | 0.6 | 2.9 |
| | Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

Among different regions, the cropping pattern was dominated by wheat and paddy in the north and eastern region. Paddy occupied around 26 per cent share in the gross cropped area in the

north and around 50 per cent share in the eastern and north-eastern region. Wheat was the major crop in the north occupying around 36 per cent share of gross cropped while it occupied less than 15 per cent share in the eastern and north-eastern region. Thus, both wheat and paddy together occupied 65 per cent of the total cropped are in the east and north-east and 62 per cent area in the north. The contribution of paddy in the southern region was 31 per cent and in the west and central it occupied less than 13 per cent share. On the other hand wheat occupied around 19 per cent share in the west but was almost non-existent in the south because of the climate being not suitable to wheat in the south as is also evident from the secondary data. Coarse cereals like jowar, bajra, maize, barley and ragi occupied around 7 to 10 per cent gross cropped area in all the regions and their share did not vary much across various regions. Whereas bajra was the main coarse cereal in the west and central region, maize dominated among coarse cereals in rest of the three regions namely, east and north-east, north and south. Pulses occupied around 10 per cent area in the south and west and central region while their share was only 3 per cent in the east and north-east and the north region. Overall foodgrains share in gross cropped area was highest 75 per cent in the east and north-east region; it was slightly less around 74 per cent in the north; slightly above 50 per cent in the south and around 50 per cent in the west and central region.

Among other crops, oilseeds dominated in the west and central region (mainly groundnut and soybean) where they occupied 23 per cent share of the gross cropped area. Their share was 10 per cent in the south and less than 5 per cent in the east and north-east and the north region. The three commercial crops namely, cotton, jute and sugarcane occupied around 15 per cent share of the gross cropped area in the west and central, 8 per cent in the south, 6.5 per cent in the north and only 1 per cent in the east and north-east. Horticultural crops namely fruits, vegetables, floriculture, spices and plantation occupied highest share of gross cropped area of 19 per cent in the east and north-east, 16 per cent area in the south, around 12.6 per cent area in the north and least 9 per cent area in the west and central. In addition there were other crops like fodder, eucalyptus, forest species, coconut, mullburry, tapioca, tea, coffee, rubber, tobacco and so on. These other crops contributed highest 14 per cent share of the gross cropped area in the south region followed by 3 per cent in the north, and west and central each and less than 1 per cent in the east and north-eastern region. Thus, paddy and horticultural crops dominated cropping pattern in the east and north-east; paddy and wheat in the north; paddy, horticultural crops and other commercial crops like coconut, tea, coffee, rubber etc., in the south; while paddy, wheat, oilseeds and cotton were the predominant crops in the west and central region. Thus, we find our household cropping pattern trends completely in consonance with the existing secondary sources on cropping pattern[1]

## 2.6 Household Income, Crop Productivity and Profitability

The data pertaining to household income of sample beneficiaries was collected for the reference period July 2012 to June 2013. The information was collected under three categories viz., agricultural activities, agricultural allied activities and non-farm activities. The income through agricultural source included cultivation of foodgrains, oilseeds, various commercial crops, horticultural crops, plantation crops and miscellaneous other crops. Dairy, livestock rearing, fishery, poultry and related activities formed income from allied activities. Sources such as self-

[1] For comparison see Agricultural Statistics at a Glance, 2014, Directorate of Economics and Statistics, Ministry of Agriculture, Department of Agriculture and Cooperation, Government of India.

business, salary and pension from various government and private services, agricultural and non agricultural wages, etc., were considered as non-farm income. It is to be noted that agricultural income was calculated by subtracting from gross returns the cost of production incurred by the households. The gross returns were equal to output produced multiplied by the price received. Similarly, income for allied activities and non farm income was collected as net income.

The details of household income are given in Table 2.14. At the aggregate, average household income for the selected beneficiaries was recorded slightly above Rs 2 lakh per annum. The agricultural activities constituted Rs 1.35 lakh that was 2/3$^{rd}$ share of the aggregate income. Allied activities contributed around Rs 30 thousand per annum with a share of less than 15 per cent to the aggregate while non-farm income was slightly above the allied activities, Rs 38 thousand per annum consisting of 19 per cent share in the aggregate income. Across various regions, the highest income was recorded in the northern region Rs 2.9 lakh per annum followed by west and central region Rs 2.4 lakh, southern region Rs 1.7 lakh while east and north-eastern region recorded lowest household income of Rs 1.2 lakh per annum. The share of agriculture in aggregate income was also lowest in the east and north eastern region only 55 per cent while it was highest in the west and central region 77 per cent. The share of agriculture in northern region was 64 per cent and in the southern region it was 71 per cent in the aggregate income. The share of allied activities in total income was highest 18 per cent in the north region and lowest 14 per cent in the south region while in the east and west region the share of allied activities in the total income was 14 per cent, each. The share of non-farm in total income was highest in the east and north-eastern region around 31 per cent while in the northern region the share was 18 per cent and it was less than 15 per cent in the south and east and north-eastern region.

Table 2.14: Details of household income from various sources for the reference year 2012-13 (Rs per household)

| State | Agricultural activities | Allied activities | Non agricultural activities | All sources |
|---|---|---|---|---|
| South | 122219<br>(71.0) | 24481<br>(14.2) | 25534<br>(14.8) | 172234<br>(100.0) |
| West and Central | 186894<br>(76.9) | 26430<br>(10.9) | 29639<br>(12.2) | 242963<br>(100.0) |
| East and North-East | 68318<br>(55.0) | 17574<br>(14.1) | 38420<br>(30.9) | 124312<br>(100.0) |
| North | 187687<br>(64.2) | 51602<br>(17.6) | 53148<br>(18.2) | 292437<br>(100.0) |
| **All India** | **135161<br>(66.7)** | **29628<br>(14.6)** | **37964<br>(18.7)** | **202753<br>(100.0)** |

Details of household income calculated for different states are depicted in Annex Table 2.12A. As was the case in livestock and farm assets Punjab led in the household income in the country as well. The aggregate household income among the selected beneficiaries in Punjab was Rs 8.4 lakh per annum against the country average of Rs 2 lakh per annum. The next closest state was Haryana with a distant average amount of Rs 4.5 lakh per household. Haryana was followed by Puducherry Rs 3.9 lakh, Rajasthan Rs 3.5 lakh and Mizoram, Goa and Gujarat Rs 2.8 lakh, each. Once again the north-eastern states, viz., Assam, Meghalaya, Tripura, Arunachal Pradesh,

Nagaland and Manipur as well as Kerala lied at the bottom with an average per annum income equal to or less than Rs 50 thousand. The proportion of agricultural activities in the aggregate income was highest around 98 per cent in Karnataka followed by Rajasthan 86 per cent, Mizoram 83 per cent, Haryana 81 per cent, Maharashtra 78 per cent and Madhya Pradesh 78 per cent. Contribution of agricultural activities in the aggregate income was lowest in Meghalaya only 18 per cent, Uttrakhand 23 per cent, Manipur 26 per cent, Andaman Nicobar 34 per cent and Jharkhand, West Bengal, Arunachal Pradesh and Sikkim all around 38 per cent. The proportion of allied activities in the total income was above 30 per cent in Andaman, Tripura, Punjab, Jharkhand and Arunachal Pradesh while their contribution was 5 per cent or less in Maharashtra, Bihar Madhya Pradesh, Mizoram, Nagaland and Karnataka. The share of non-farm income in aggregate income was highest in Uttrakhand 62 per cent, Manipur 60 per cent, Meghalaya 59 per cent, Nagaland 57 per cent and Sikkim 40 per cent. On the other hand, states dependent more on agriculture like Punjab and Haryana had lower proportion of aggregate income from the non-farm activities. The states that had less than 10 per cent share in total income from the non-farm activities were Haryana, Tamil Nadu, Tripura, Rajasthan, Punjab and Karnataka.

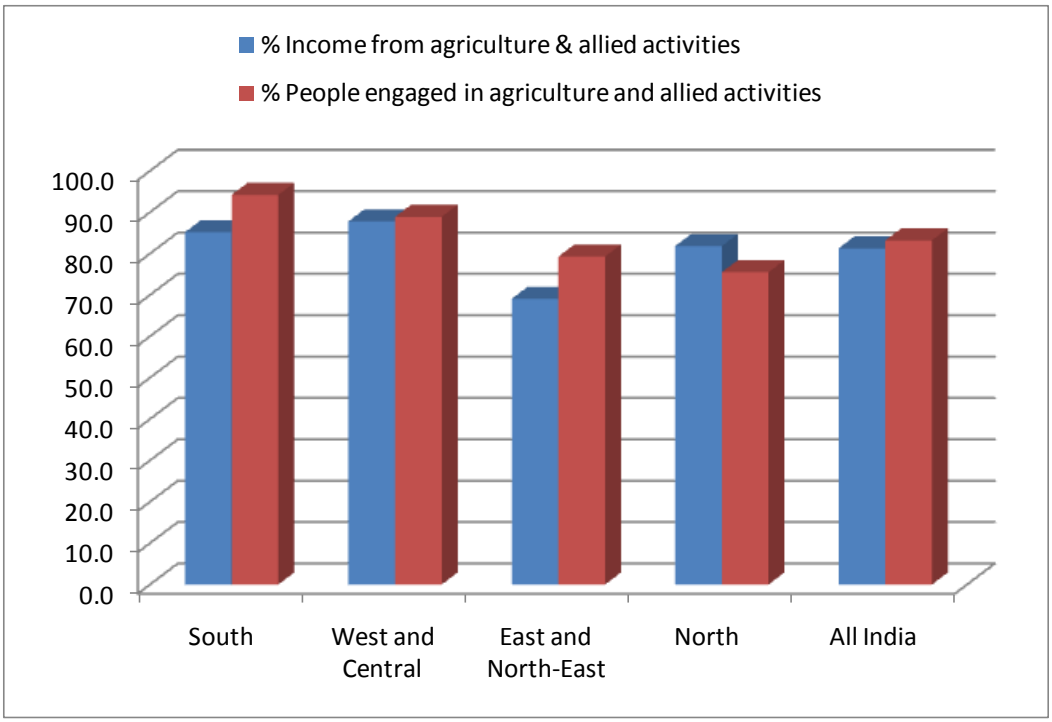


Figure 2.2: Income and employment share of agriculture among the beneficiaries

Comparing the income and employment share of agriculture and non farming activities, it is interesting to note that at the aggregate, share of income from agriculture and allied activities as well from non-farm activities was closer to their employment share. However, across regions there were wide variations as is shown by Figure 2.2 and 2.3. The share of income from agriculture and allied activities was less than their share in employment in the south, west and central and east and north-east whereas in the north their share in income was more than their share of employment, indirectly indicating higher agricultural as well as per person productivity

in agriculture in the north in comparison to other three regions. On the other extreme, in the case of non-farm activities, the share of north in employment was more than their share in income as compared to the other three regions whose share of non-farm income was more than their share in employment indicating less productivity of north region in non-farm activities as compared to other regions.

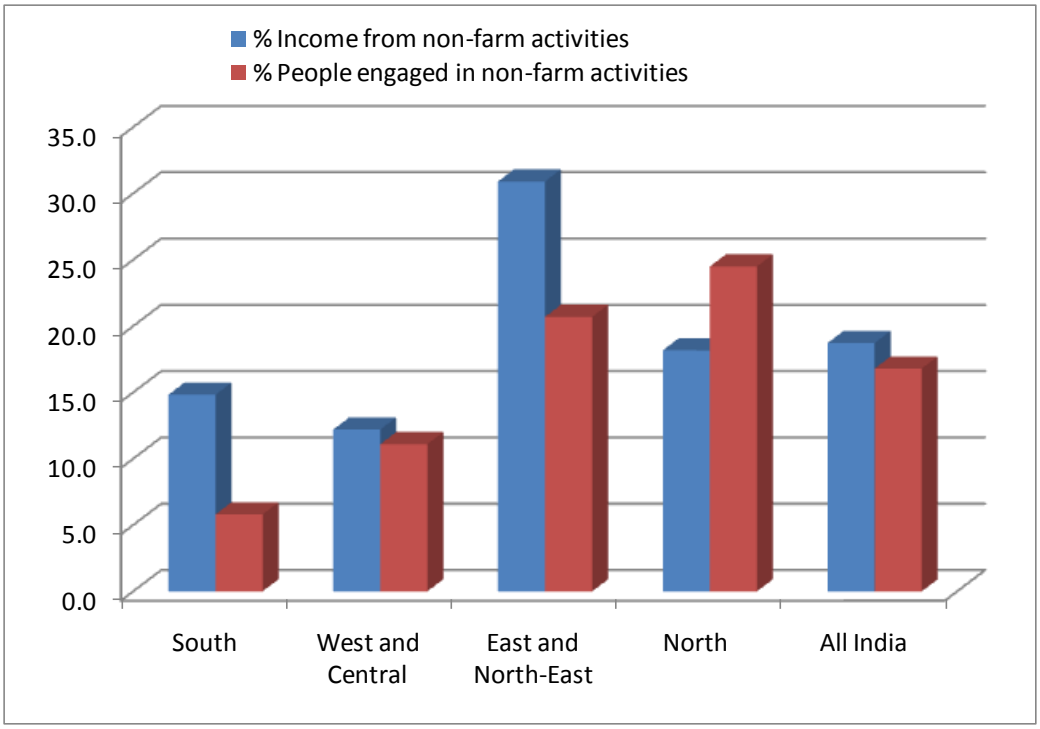


Figure 2.3: Income and employment share of non farming among the beneficiaries

Table 2.15: Details of net sown area, productivity and net returns (reference year 2012-13)

| S.N. | Particulars | South | West and Central | East and North-east | North | All India |
|---|---|---|---|---|---|---|
| 1 | Cultivated area Per HH (Acres) | 7.5 | 8.3 | 3.6 | 6.3 | 6.1 |
| 2 | Value of Production Per Acre (Rs) | 26408 | 24830 | 20812 | 27209 | 25090 |
| 3 | Cost of Cultivation Per Acre (Rs) | 11179 | 8759 | 6554 | 9956 | 9130 |
| 4 | Net income Per Acre (Rs) | 15229 | 16071 | 14258 | 17253 | 15960 |

Table 2.15 presents productivity in value terms as well cost of cultivation and net profitability per acre. It is apparent from the data that aggregate farm productivity in value terms was highest in the north, Rs 27 thousand per acre compared to Rs 26 thousand in the south, Rs 25 thousand in the west and central and Rs 21 thousand in the east and north-east. In comparison, cost of cultivation was highest in the south Rs 11 thousand per acre, followed by north Rs 10 thousand per acre, west and central Rs 9 thousand per acre and the least Rs 6.5 thousand per acre in the east and north-east region. Thus, although eastern region was least productive among the four regions but it also had lower cost of production thereby the wedge in profitability among eastern and other regions was not as wide as it was in the case of farm productivity. This is visible from the statistics that indicates per acre profitability of Rs 17 thousand in the north, Rs 16 thousand in

the west and central, Rs 15 thousand in the south and slightly less Rs 14 thousand in the east and north-east region. As was stated above, the cultivated area was highest in the west and central, followed by north, south and lowest in the east and north-east. Nevertheless due to lower per acre farm productivity and lower cultivated area, although having lower cost of cultivation, net household income in the east and north-eastern region was almost half that of the country as a whole and slightly above half of southern region and slightly above one third that of north and west and central regions.

Table 2.16: Crop Yield among the selected households (Quintals per acre)

| Crop | South | West and Central | East and North East | North | All India |
|---|---|---|---|---|---|
| Paddy | 21.6 | 19.7 | 13.0 | 19.8 | 17.7 |
| Wheat | - | 14.5 | 11.3 | 15.3 | 14.4 |
| Jowar | 8.1 | 15.2 | 4.9 | 9.9 | 11.5 |
| Bajra | 4.9 | 10.0 | 4.3 | 8.4 | 9.4 |
| Maize | 15.9 | 15.3 | 12.8 | 12.7 | 13.8 |
| Tur | 4.9 | 4.2 | 4.2 | 3.7 | 4.3 |
| Gram | 6.0 | 6.2 | 4.7 | 4.9 | 5.9 |
| Other pulses | 4.1 | 3.7 | 2.6 | 2.5 | 3.5 |
| Groundnut | 5.2 | 8.0 | 8.2 | 13.2 | 6.7 |
| Sunflower | 6.4 | - | 3.7 | 7.8 | 5.6 |
| Soyabean | 7.2 | 5.9 | 7.2 | 2.5 | 6.0 |
| Rape & Mustard | - | 8.5 | 3.9 | 4.9 | 6.5 |
| Cotton | 7.2 | 8.4 | - | 9.7 | 8.3 |
| Jute & Mesta | - | - | 10.4 | - | 10.4 |
| Sugarcane | 290.7 | - | 150.9 | 224.9 | 146.3 |
| Fruits | 53.6 | 91.3 | 17.3 | 31.5 | 49.6 |
| Vegetables | 23.9 | 51.1 | 20.3 | 54.5 | 38.6 |
| Flowers | 22.1 | 27.0 | 40.9 | - | 9.0 |
| Spices | 2.0 | 6.8 | 10.4 | 13.9 | 9.6 |

In the above paragraphs we presented farm productivity, cost of cultivation and farm profitability at the aggregate of all crops. In this section we present the productivity and profitability of individual crops grown by the selected beneficiaries. The crop productivity is presented mainly for the crops for which we had sufficient numbers of observations. It is to be noted here that the yield rate presented in Table 2.16 is the average yield without differentiating between different varieties produced. Therefore, some of the differences in the yield rate across different regions could be due to different varieties grown in different states and regions. On average, productivity of paddy was recorded as 18 quintals per acre that varied from 13 quintals per acre in the east and north-east to 22 quintals in the south. Wheat productivity was 14 quintals per acre varying between 11 quintals in east and north-east and 15 quintals in the north. Compared to paddy and wheat, yield variations were much higher in the coarse cereals and pulses as these crops were grown mostly in the dry zones. Jowar yield rate varied from 5 quintals to 15 quintals while bajra yield rate varied from 4 quintals to 10 quintals per acre. Maize productivity was more consistent and it varied between 12 to 16 quintals per acre in different regions. Pulse productivity averaged at 5 quintals per acre and it varied from 2 quintals to 6 quintals in different regions. Similarly, yield rate of oilseeds averaged at 7 quintals per acre of groundnut, 6 quintals of sunflower and soybean and 6.5 quintals of rapeseed and mustard. Cotton averaged at 8 quintals per acre irrespective of different varieties of cotton grown. Average yield for sugarcane was around 150 quintals, albit there were wide variations across different regions. Similarly, fruits productivity

averaged at 50 quintals and vegetables 40 quintals although it is difficult to club all the fruits and vegetables together. It is more appropriate and meaningful to measure the profitability of crops which are grouped together.

Table 2.17: Crop Profitability among the selected households (Rs per acre)

| Crop | South | West and Central | East and North East | North | All India |
|---|---|---|---|---|---|
| Paddy | 13699 | 11217 | 9857 | 18360 | 13403 |
| Wheat | 5035 | 12389 | 7378 | 12192 | 11491 |
| Jowar | 6662 | 8187 | 5019 | 1584 | 5672 |
| Bajra | 3331 | 6867 | 4429 | 5506 | 6329 |
| Maize | 10284 | 7103 | 10997 | 8322 | 9357 |
| Ragi | 6698 | - | 7500 | - | 6703 |
| Minor Cereals | - | 15907 | 5688 | 8455 | 11480 |
| Tur | 6429 | 10397 | 11056 | 9321 | 9308 |
| Gram | 9000 | 11903 | 9298 | 9638 | 11425 |
| Other pulses | 7776 | 8723 | 7178 | 7264 | 7824 |
| Groundnut | 8298 | 11195 | - | - | 10308 |
| Sunflower | 11132 | - | 11166 | - | 9585 |
| Soyabean | 15724 | 10401 | - | 5512 | 10791 |
| Rape & Mustard | - | 18438 | 8101 | 10202 | 13956 |
| Other Oilseeds | 4546 | 24081 | 15448 | 7089 | 16266 |
| Cotton | 18884 | 21011 | - | 31606 | 21391 |
| Jute & Mesta | - | - | 10557 | - | 10557 |
| Sugarcane | 45063 | 29107 | 15207 | 37130 | 33742 |
| Fruits | 30973 | 48638 | 50513 | 68692 | 47796 |
| Vegetables | 20651 | 33426 | 16127 | 31506 | 25557 |
| Flowers | 39988 | 38863 | 37437 | 1553 | 13009 |
| Spices | 9524 | 25675 | 33971 | 21627 | 27098 |
| Plantation | 21639 | - | 72811 | 7863 | 57206 |
| Others | 15172 | 24156 | 69703 | 15375 | 17929 |
| Total | 15229 | 16071 | 14258 | 17253 | 15960 |

The net returns for the major crops grown by the selected beneficiary households are presented in Table 2.17. Among foodgrain crops, profitability was highest for paddy and wheat. In both these crops net profit that is worked out by subtracting cost of cultivation from the value of output was above Rs 13 thousand in the case of paddy and Rs 11 thousand in the case of wheat. The net profit in the case of coarse grains, namely jowar, bajra, maize and ragi was much lower that ranged between Rs 5.7 thousand to Rs 9.4 thousand. Despite lower profitability farmers were growing coarse grains because of climatic conditions and because of comparatively lower cost of cultivation of these crops. Profitability of pulse crops varied between Rs 8 thousand to Rs 11 thousand per acre. Profitability of oilseeds was either equal to or higher than the rice and wheat. It ranged between Rs 9.5 thousand to Rs 16 thousand per acre. Profitability of cotton was almost double that of foodgrains and profitability of sugarcane was almost triple. However, there was a lot of risk involved in the case of cotton and sugarcane was annual crop harvested only once in a year whereas foodgrain were grown for rabi and kharif both the seasons. Like cotton and sugarcane, profitability of fruits, vegetables and other spices and plantations was more than double to triple that of foodgrain crops. However, despite higher profitability from high value crops, the cropping pattern showed much lower area under these crops as these crops were not only risk oriented but also required much higher fixed capital investment that was beyond the reach of small and marginal farmers. Moreover, there were many factors that played a role in

determining farmers' decision to grow or not to grow such crops such as geographic location, availability of market, climate factor, rainfall pattern, soil suitability and so on. Overall crop productivity averaged at Rs 16 thousand per acre of cropped area and it was highest Rs 17 thousand in the north region, Rs 16 thousand in the west and central, Rs 15 thousand in the south and lowest Rs 14 thousand in the east and north-east region.

## 2.7 Beneficiary households' awareness about the RKVY programme

Before closing the chapter we provide some details about households' awareness level about the RKVY programme and from where they obtained information about the programme. Table 2.18 provides details on percentage of household awareness about the RKVY programme. Although we surveyed only the beneficiary households under RKVY programme but we observed that out of the selected beneficiaries only around 40 per cent had some knowledge or they had heard about the RKVY programme before accessing the subsidy. Even after accessing the subsidy a clear majority was not knowing that they have obtained subsidy under the RKVY programme. We approached those households only on the basis of having the list of RKVY beneficiaries otherwise it would be difficult to collect information from them as they were not able to identify themselves as beneficiary of RKVY programme. In most of the cases, households accessed the concerned departments that provided input or subsidy under RKVY programme through the village or Gram Parcharak (informer).

Table 2.18: Awareness about RKVY programme

| State | % of beneficiaries aware | Sources of awareness (Per cent to those who are aware) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | News Paper | Agri Dept | SAU | KVK | KSK | Friends | Input suppliers | TV / Radio | Agri Exhibitions | ZP / TP /GP | Other Sources |
| South | 65.30 | 4.93 | 57.55 | 3.46 | 8.81 | 3.46 | 6.18 | 0.00 | 0.94 | 1.15 | 1.47 | 12.05 |
| West and Central | 41.17 | 9.95 | 35.40 | 1.29 | 0.39 | 0.13 | 15.37 | 0.13 | 0.52 | 1.16 | 1.16 | 34.50 |
| East and North-East | 34.67 | 9.74 | 57.93 | 0.21 | 0.73 | 0.10 | 5.80 | 0.21 | 4.87 | 0.52 | 1.24 | 18.65 |
| North | 31.66 | 14.95 | 54.70 | 0.77 | 1.23 | 0.00 | 7.55 | 0.31 | 5.24 | 1.39 | 0.77 | 13.10 |
| All India | **40.89** | **9.43** | **51.97** | **1.50** | **3.05** | **1.05** | **8.47** | **0.15** | **2.81** | **1.02** | **1.20** | **19.36** |

Comparatively higher numbers of beneficiaries were aware about the RKVY programme in the south 65 per cent, as against 41 per cent in the west and central, 35 per cent in the east and north-east and the least 32 per cent in the north. Among those who were aware about the RKVY programme the main source of their information was the concerned department 52 per cent, from the newspaper 9 per cent, friends and relative 8 per cent, *Krishi Vigyan Kendra* and television and radio around 3 per cent each, State Agricultural Universities, *Kissan Kyosks*, exhibitions and the three tiers of Panchayats also provided information to few households about the RKVY programme. The above sources were more or less same across various regions as depicted in the statistics in Table 2.18.

# Chapter 3

## Sectoral Analysis (Major Sectors)

The Government of India helps agriculture through Central and Centrally Sponsored Schemes and Programmes as responsibility of developing the agricultural sector lies with the state. The RKVY is one such programme of the Ministry of Agriculture and is being funded by the union government. Funding under RKVY programme was distributed across 20 main sectors. Each of these main sectors had sub-sectors. In all, there were 152 sub-sectors. These main and sub-sectors covered all the farming activities, research, information technology, extension, training and also some non-farming activities. The RKVY programme has been implemented in all the 28 States and 7 Union Territories during the Eleventh Five Year Plan. By the end of 11$^{th}$ Plan, RKVY programme had implemented 5749 numbers of projects, programmes and schemes covering all the sectors and sub-sectors. An expenditure of Rs. 27414 crore was incurred by 28 states against proposed or allocated budget of Rs. 37920 crore. As discussed in the first report submitted to the Department of RKVY, around eight sectors, viz., crop development, micro/minor irrigation, horticulture, animal husbandry, agriculture mechanisation, seed production, innovative programme and natural resource management accounted for more than 75 per cent of the total expenditure distributed across 20 main sectors. Expenditure per project was highest for micro and minor irrigation (Rs. 17.2 crore), followed by agricultural mechanisation (Rs. 9.5 crore) and crop development (Rs. 6.65 crore). Crop development, micro/minor irrigation, horticulture, animal husbandry and agriculture mechanisation were the top five sectors with respect to investment under RKVY programme during the 11$^{th}$ Five year Plan. These sectors are, therefore, classified as major sectors in this chapter. The thrust of these sectors under RKVY and the consequent implications and achievements are discussed elaborately in the subsequent sections of this chapter based on our primary survey data.

### 3.1 Agricultural Mechanisation

Indian agricultural operations still depend on traditional implements which were adequate when rural labour was plentiful. However, the availability of agriculture labour has come down and the input costs have increased tremendously. The tractor density in India is about 16 tractors for 1000 hectares, as against the world average of 19 tractors; in sharp contrast, USA has a density of 27 tractors per one thousand hectare of cropped area (GoI, 2012-13). However, over time the lack of mechanisation has somewhat improved. According to the Department of Agriculture, the share of agriculture workers and draught animals (farm power sources in agriculture) has come down from 63.5 per cent in 1971-72 to 13.7 per cent in 2009-10, whereas the share of tractors, power tillers and motors has gone up from 36.5 per cent to 86.3 per cent during the same time period (Ravi, 2013). Despite these improvements, many states such as Orissa, Rajasthan, Himachal Pradesh, Jammu & Kashmir, Chhattisgarh, Jharkhand, Gujarat, Assam, Madhya Pradesh and Maharashtra had less than 0.90 kW/ha in 2001 (Srivastava, 2006). If the future food requirement increases to 280 million tonnes food grains by 2020-21, which is not very unlikely (Kumar, 2013), farm power availability in the country has to scale to at least 2.0 kW/ha by the end of the Twelfth Plan (Ravi, 2013).

With the beginning of the plan era in India, agricultural expansion took place by bringing in new area under cultivation. Soon the area expansion peaked and the expansion in agriculture during the green revolution period shifted from extensive to intensive agriculture. The intensive expansion in agriculture by the way of more mechanisation and by intensive use of inputs still remains the key for future increase in productivity in the agriculture sector and meeting with the growing needs of food security. The targets set under RKVY for achieving 4 per cent growth rate in agriculture at the country as a whole further emphasises the role of technology both bio and mechanical technology in the agriculture sector. Farm mechanisation not only enhances crop productivity by ensuring timely farm operations but also helps in dealing with the problem of labour shortage. The total expenditure in the RKVY under farm mechanisation during the 11$^{th}$ Five Year Plan was Rs 2190 crore, which is approximately 8 per cent of total expenditure under the programme during the above mentioned time period.

In our first report, we provided the details of expenditure incurred on different sectors under RKVY, and tried to measure the efficiency of the programme through linking the outlay incurred with the overall increase in production and growth achieved in the agricultural sector. Although, we successfully inferred how the programme has helped in accelerating the overall growth in the agricultural sector but with the secondary data it is not possible to draw conclusions about the programme and its overall working at the household level. Therefore, in order to have a closer look at the programme and draw conclusions about the efficiency and delivery mechanism of the programme at the household level, a primary household survey was carried out throughout the country. A detailed analysis of methodology followed in the household survey and the socio-economic characteristics of the households, their cropping pattern, resource use and details about the cost and returns from the farming sector are discussed in Chapter 2. The present chapter focuses on the sectoral performance of RKVY concentrating mainly on the major sectors, viz., agricultural mechanisation, horticulture, crop development, micro and minor irrigation and animal husbandry. The performance of other minor sectors is the subject matter of Chapter 4, household observations about the working of RKVY is subject matter of Chapter 5 while infrastructure projects are discussed in Chapter 6.

As our survey was carried out in the entire country, to keep our analysis comprehensive, we divide the country into four regions, namely North; Central and West; East and North-east and South covering all the 28 states falling in these four regions. In addition, Union Territories, viz., Pondicherry and Andaman Nicobar are also covered in the South region. The analysis of these four regions will also give reference of the respective states falling in each region. The data shall contain the aggregate (all India) to present the macro picture for the entire country. To keep the flow in the text smooth and comprehensive, all India tables will be presented in the text while regional tables will be kept in the Annexure where ever necessary. It is to be noted at the outset that RKVY programme was neither universal nor targeted. In other words, the programme was not designed to provide subsidy or physical inputs to all the farmers nor it was targeted to any specific groups or category of farmers although some broader targets of giving due representation to reserved category farmers, viz., Scheduled Cast, Scheduled Tribe and Other Backward Castes. The essence of the programme was to disseminate good practices in agriculture and provide access to some of the modern implements at subsidised rate to the farmers, in most of the cases, at first come first serve basis. As mentioned in the previous chapter, we selected beneficiary farmers based on the list provided by various implementing

departments whereby emphasis was given to have the due representation of all the activities covered under RKVY in all major and minor sectors.

### 3.1.1 Details of Interventions under Agricultural Mechanisation

Tables 3.1a presents details of interventions carried out for making provision of mechanical implements to the farmers under RKVY programme among the selected households. The mechanical interventions were carried over by the Department of Agriculture in most of the cases, but in some cases such interventions were also found by the Horticulture Department or by Micro and Minor Irrigation and so on. Among our selected households, 21 per cent availed the benefit under the broad category of mechanisation. Thus, every fifth selected household had availed some subsidy under mechanisation. We have classified, machines and equipments under RKVY programme into seven broad categories, namely land development equipments (tractor, tiller, cultivator, rotavater, ploughs and harrows); sowing and planting equipments (seed drill and other seed sowing equipments); plant protection equipments (sprayers etc.); harvesting and threshing equipments (cutters, harvesters, threshers, combine harvesters etc.); post harvest and processing machines (choppers, processors etc.); water lifting implements (pump sets); and all other remaining equipments. The intervention cost for mechanisation per household on average was around Rs 85 thousand out of which subsidy provision under the RKVY programme was around 38 per cent that turns out around Rs 32 thousand per household (Table 3.1a).

Looking at the kind of implements for which subsidy provision was made: at the aggregate, the highest numbers of households invested in pump sets in which subsidy was given to around 5 per cent of the selected households. Pump sets were followed by tiller and sprayers in which around 2.5 per cent households and rotavators around 2 per cent of the selected households invested. The highest amount of subsidy was given for the combine harvester, above Rs 5 lakh and tractor, Rs 1.4 lakh per household. Tiller and harvester received subsidy amount around Rs 50 thousand per household while rotavator, thresher, seed drill and other sowing, planting and post harvest equipments received subsidy ranging between Rs 20 to 50 thousand per beneficiary household. Although the numbers of households investing in pump sets was highest but the amount of subsidy received was only Rs 12 thousand per household and in the case of sprayers the subsidy amount was only Rs 2 thousand per household. Looking at the percentage of subsidy to total investment by the households, the subsidy percentage was highest in the case of brush/weed cutter (74 per cent), chaff cutter (61 per cent), sprayers (52 per cent) and pump set (51 per cent). It was lowest for harvester and tractor (29 per cent, each), thresher (33 per cent) and seed drill (39 per cent). Except sprayer that were mostly manually driven, most of the other implements were all power driven. In most of the cases, the equipments bought in the subsidy programmes under RKVY were found in the custody of the households and they were very well in working conditions and were being used by the households.

Table 3.1b presents regional details of interventions under mechanisation. As against the aggregate average of 21 per cent of the selected households participating in the mechanisation activities, the proportion was highest 27 per cent in the case of south, a little less than that (around 26 per cent) in the west and central, less than $1/5^{th}$ (only19 per cent) in the east and north east and only 15 percent in the case of north. In the first report based on the website data we portrayed that out of total expenditure under RKVY on mechanisation, south region constituted

around 35 per cent, east and north-east 31 per cent, west and central around 29 per cent and north only 5 per cent. Our primary survey observations are in consonance with the secondary data compiled from the website. This also depicts that farming operations in the northern region are already mechanised to a great extent and thereby farm mechanisation was not the thrust area in the RKVY programme in the north. The subsidy amount given under the programme was also highest in the south, Rs 58 thousand per household, followed by west and central, Rs 25 thousand, north Rs 24.5 thousand and east and north-east Rs 24.3 thousand while the overall amount of subsidy averaged at Rs 32 thousand per household. It was highest 47 percent of the total investment by the households in the west and central, 39 per cent in the south and east and north-east, each and lowest 25 per cent in the north. All the regions recorded above 90 per cent of the equipments in working conditions. The east and north-east region had more equipment manually driven compared to all other regions where more numbers of equipments were power driven.

Table 3.1a: Interventions made under agricultural mechanisation - Implement details

| Sl. No | Name of the implements | Mode of operation (%) power operated | % of beneficiaries | Average cost (Rs. per household) | Subsidy amount received (Rs per household) | Subsidy as a per cent of cost | % of equipment in working condition |
|---|---|---|---|---|---|---|---|
| 1 | Tractor/mini tractor | 98.6 | 0.9 | 474772 | 139108 | 29.3 | 100.0 |
| 2 | Rotavator | 96.8 | 1.9 | 80411 | 33853 | 42.1 | 97.4 |
| 3 | Tiller | 93.8 | 2.4 | 127498 | 54187 | 42.5 | 95.3 |
| 4 | Cultivators | 87.2 | 0.6 | 21045 | 8692 | 41.3 | 95.7 |
| 5 | Ploughs | 71.4 | 0.3 | 26792 | 11279 | 42.1 | 100.0 |
| 6 | Harrow | 100.0 | 0.5 | 34646 | 14170 | 40.9 | 84.6 |
| 7 | Other land development, tillage and seed bed preparation equipments | 39.0 | 0.9 | 61306 | 18821 | 30.7 | 97.4 |
| 8 | Seed drill | 96.2 | 0.6 | 53337 | 20748 | 38.9 | 88.5 |
| 9 | Other Sowing and Planting equipments | 80.0 | 0.1 | 563138 | 204419 | 36.3 | 100.0 |
| 10 | Sprayers | 21.3 | 2.3 | 4330 | 2256 | 52.1 | 91.5 |
| 11 | Other Plant protection equipments | 85.4 | 1.7 | 29719 | 13552 | 45.6 | 91.2 |
| 12 | Cutters | 74.3 | 0.4 | 19495 | 14348 | 73.6 | 91.4 |
| 13 | Combine harvesters | 100.0 | 0.2 | 1835058 | 534002 | 29.1 | 100.0 |
| 14 | Thresher | 95.7 | 0.8 | 83565 | 27827 | 33.3 | 98.6 |
| 15 | Other Harvesting and threshing equipments | 75.0 | 0.7 | 137576 | 34944 | 25.4 | 94.6 |
| 16 | Chopper | 85.2 | 0.3 | 19791 | 11993 | 60.6 | 88.9 |
| 17 | Other Post harvest and agro processing machines | 56.3 | 0.6 | 67111 | 32750 | 48.8 | 93.8 |
| 18 | pump set | 96.4 | 4.7 | 23984 | 12160 | 50.7 | 92.2 |
| 19 | Other Water lifting implements | 35.3 | 0.2 | 14427 | 5410 | 37.5 | 94.1 |
| 20 | Others | 68.6 | 0.9 | 108571 | 73466 | 67.7 | 97.1 |
|  | Total | 79.7 | 20.9 | 85118 | 32239 | 37.9 | 94.0 |

Table 3.1b: Interventions made under agricultural mechanisation - regional details

| Sl. No | Name of the Region | Mode of operation Power | % of beneficiaries | Average cost (Rs. Per equipment) | Subsidy as a per cent of cost | % of equipment in working condition |
|---|---|---|---|---|---|---|
| 1 | South | 87.7 | 26.7 | 146557 | 57659 (39.3) | 94.9 |
| 2 | West & Central | 85.8 | 26.3 | 53418 | 25267 (47.3) | 93.3 |
| 3 | East and North East | 65.0 | 18.5 | 61751 | 24337 (39.4) | 94.8 |
| 4 | North | 84.0 | 15.2 | 97007 | 24520 (25.3) | 92.6 |
| 5 | All India | 79.7 | 20.9 | 85118 | 32239 (37.9) | 94.0 |

Further details of RKVY intervention about the provision of mechanical implements to the selected households in the four regions are provided in Annex Table 3.1.1A. Looking at the southern region, the statistics in Table 3.1.1A reveals that the household priority in this region was highest for plant protection equipments, tiller and other post harvest and processing implements. The highest per household subsidy was recorded in the case of combine harvester (Rs 5.3 lakh), followed by tractor (Rs 1.4 lakh), thresher (Rs 52 thousand) and tiller (Rs 47 thousand). At the aggregate, Rs 57 thousand per household subsidy was provided in the south region that was slightly less than 40 per cent of the total investment made by the households in that region. The subsidy amount varied widely among the southern states. The variation was to the extent ranging from Rs 4.8 lakh per household in Puducherry to a paltry amount of Rs 11 thousand per household in Kerala. The subsidy amount averaged at Rs 98 thousand per household in Andhra Pradesh, Rs 82 thousand in Goa, Rs 70 thousand in Tamil Nadu, Rs 48 thousand in Andaman and Nicobar and Rs 27 thousand in Karnataka among the selected households. Whereas a large amount of subsidy was given for high powered machinery like combine harvester and tractor in the case of Puducherry, Andhra Pradesh, Karnataka and Tamil Nadu, no subsidy at all was provided for these items in the rest of the states in the southern region, given their generally low size of holdings that has diseconomies of scale for large machine implements. In Puducherry the subsidy amount was so high because all the six households who benefited from mechanisation programme were given subsidy for only combine harvester and no other implement was given any subsidy under RKVY programme.

The west and central region having the states like Rajasthan and Gujarat is more rainfed compared to the other three regions. The priority under RKVY by the state governments in this region was for putting up more pump sets for ground water irrigation, machinery suited for the dry land like rotavator, spray pumps and brush cutter for checking pests and weeds and thresher for post harvest activities. At the aggregate, around 26 per cent of the selected households in this region accessed subsidy for buying mechanical equipments and the subsidy amount averaged at Rs 25 thousand per household (Annex Table 3.1.1A). The subsidy amount was highest for tractor, Rs 3.3 lakh per household, followed by tiller Rs 60 thousand, rotavator Rs 32 thousand, chaff cutter Rs 20 thousand and brush cutter Rs 17.5 thousand per household. Across various states in the region, the subsidy amount varied from Rs 2.2 lakh per household in Maharashtra to only Rs 5.5 thousand per household in Rajasthan. In other states in the region, the average subsidy amount per household was Rs 25 thousand in Chhattisgarh, Rs 20 thousand in Gujarat and Rs 10 thousand in Madhya Pradesh. The subsidy amount was high in Maharashtra as only 19 households out of total 350 households obtained subsidy under mechanisation and 9 out of them

obtained subsidy for tractor (at Rs 4.2 lakh per household) and another four obtained subsidy for rotavator (at Rs 78 thousand per household). State wise 5 per cent of the selected households in Maharashtra were given subsidy for mechanisation, while 53 per cent in Gujarat, 35 per cent in Chhattisgarh, 30 per cent in Madhya Pradesh and less than 4 per cent in Rajasthan obtained subsidy under mechanisation. The state of Gujarat gave subsidy under mechanisation to almost every alternate household surveyed and a large amount was given for land preparation equipments, rotavator, harrow and seed drill. In Rajasthan, on the other hand, a handful of households were given subsidy only for plough and seed drill while subsidy amount was only Rs 5 thousand per household.

In the east and north-east region that includes the largest numbers of 12 states in the region had the highest priority once again for the installation of pump sets, followed by investment in tiller, sprayer and rotavator. The percentage of households who availed subsidy under mechanisation in this region was closer to the national average of around 20 percent of the total households surveyed in the region. The per household subsidy amount was highest for tractor Rs 76 thousand, followed by tiller Rs 60 thousand, seed drill Rs 40 thousand, rotavator Rs 39 thousand and thresher Rs 21 thousand. Thus, the priority in the east region was investing in sowing and harvesting equipments as same was also the mandate of the programme of bringing green revolution to the eastern region. At the aggregate the subsidy amount given for mechanisation in the east and north east region was Rs 24 thousand per household that was slightly less than 40 per cent of the investment by the beneficiary households. However, given generally the lower size of holdings in the eastern/north-eastern region no subsidy was given for combined harvester and the numbers of households given subsidy for tractor was only 0.5 per cent of the selected households, although most of the subsidy was given for implements run by the tractor. At the aggregate, per household subsidy amount for this region was Rs 24 thousand. Looking at different states in the eastern region, subsidy for mechanisation was availed by 43 per cent in Bihar, 34 per cent in Orissa, 20 per cent in Jharkhand and only 10 per cent in West Bengal. Among the north-eastern states, subsidy for mechanisation was given to 54 per cent selected households in Nagaland, 18 per cent in Assam, 4 per cent in Arunachal Pradesh, 3.5 per cent in Sikkim, 3 per cent in Mizoram and Tripura each, and less than 1 per cent in Manipur, while none of our selected household availed subsidy for mechanisation in Meghalaya. The subsidy amount also varied from Rs 600 per household in Nagaland to Rs 43 thousand per household in Tripura in the north-east. In the four eastern states, subsidy per household was found Rs 39 thousand in Orissa, Rs 33 thousand in West Bengal, Rs 26 thousand in Bihar and Rs 17 thousand in Jharkhand. Subsidy amount was also concentrated to only a few implements in north-east while it was more widespread among many implements in the four eastern states.

The northern region especially, Punjab, Haryana and Uttar Pradesh are highly mechanised in agriculture farming. Looking at the investment pattern made and subsidy provided under RKVY programme in this region, per household investment in tractor exceeded Rs 5 lakh although subsidy provision for the same was only Rs 86 thousand, that was far less than the subsidy provided for tractor in the south region (Rs. 1.4 lakh per household). Unlike huge subsidy for combine harvester in the south, no subsidy was given for combine harvester in the north region. The other implements that attracted high subsidy were rotavator (Rs 28 thousand), tiller (Rs 26 thousand), seed drill (Rs 21 thousand) and pump set and thresher (around Rs 20 thousand, each) per household who availed the benefit. At the aggregate, around 15 percent of the selected

households in the region obtained subsidy under mechanisation and out of Rs 1 lakh investment per household, around Rs 25 thousand of subsidy was given which is exactly 25 per cent of the total investment made by the households in this region. Among the implements for which subsidy was given, the highest percentage of households obtained subsidy for pump sets, sprayer and seed drill. Looking at the subsidy pattern among different states, 24 per cent beneficiaries obtained subsidy for mechanisation in Haryana, 22 per cent in Jammu & Kashmir, 19 per cent in Uttar Pradesh, 13 per cent in Himachal Pradesh and only 4 per cent in Punjab while none of the surveyed households obtained subsidy for mechanisation in Uttrakhand. The average subsidy amount per beneficiary household was Rs 35 thousand in Haryana, Rs 27 thousand in J&K, Rs 24 thousand in Uttar Pradesh, Rs 15 thousand in Punjab and only Rs 8 thousand in Himachal Pradesh. Only in J & K and Uttar Pradesh subsidy was given for tractor whereas rotavator obtained substantial amount of subsidy in all the states except Himachal Pradesh while no subsidy was given in Uttrakhand for any mechanical implements.

To summarise the interventions made under mechanisation, around 20 per cent of the surveyed households, varying from 15 per cent in the northern region to 27 per cent in the southern region obtained subsidy under this programme. The investment made by the households surveyed ranged between Rs 53 thousand in the western region to Rs 1.5 lakh in the eastern region and it averaged at Rs 85 thousand per household. The consequent subsidy amount was Rs 24 thousand in the eastern region and Rs 58 thousand in the southern region that averaged at Rs 32 thousand per household for the entire country. The subsidy amount varied between 25 per cent of the investment in northern region to 47 per cent in the western region with an average ratio of 38 per cent for the entire country for the selected households under mechanisation programme of RKVY.

### 3.1.2 Usage of Farm Equipments and their Impact on Agriculture

RKVY programme provides incentive to the farmers to adopt best practices in agriculture in order to raise their productivity and to achieve higher growth in agricultural sector. Under the programme of mechanisation, various state departments provided subsidy to the farmers to adopt mechanised farming. In a bid to find out the usage of the machines procured under the subsidy programme, we collected information from the beneficiary households for how many days the machines purchased under subsidy have been used either for own farm or given on customary hiring basis (Table 3.1c). On average, tractor was used for around one and half month (8 hours per day) in a year's period and it cultivated around 118 acres of area during the reference year. Imputed value of own use of the tractor was worked at Rs 28 thousand per annum while it earned gross amount of Rs 60 thousand per annum on custom hiring basis without subtracting the fuel cost and maintenance charges. Rotavator was used for around 34 days cultivating around 47 acres in a year. The imputed gross monetary value of use of rotavator was Rs 19 thousand for own and Rs 32 thousand for custom hiring. Other land development tools including tiller, cultivator, plough and harrow were used approximately 15 to 30 days in a year cultivating around 20 to 50 acres of land each and their imputed value ranged between Rs 10 to 18 thousand while gross-earning from custom hiring ranged within Rs 5 to 15 thousand each during the reference year. The imputed value (own plus hired use) per acre works out around Rs 750 for tractor, Rs 1100 for rotavator, Rs 800 for tiller, Rs 350 for cultivator more than Rs 1000 for plough and above Rs 350 for harrow.

Table 3.1c: Usage of farm equipment procured under agricultural mechanisation

| Sl. No. | Name of the implements | No. of days used per imple ment per annum | Area covered (acres per imple ment) | Imputed value own use in (Rs. per implement per annum) | Rented value (Rs. per impleme nt per annum ) | Percentage increase in productivity (Modal Value) |
|---|---|---|---|---|---|---|
| 1 | Tractor/mini tractor | 43.7 | 118.3 | 28315 | 60781 | < 10 % |
| 2 | Rotavator | 33.5 | 47.0 | 18849 | 31797 | < 10 % |
| 3 | Tiller | 20.1 | 35.1 | 13041 | 14552 | < 10 % |
| 4 | Cultivators | 19.6 | 55.7 | 10928 | 8728 | < 10 % |
| 5 | Ploughs | 27.5 | 26.6 | 17727 | 15486 | No change |
| 6 | Harrow | 12.8 | 38.2 | 9174 | 4710 | < 10 % |
| 7 | Seed drill | 28.8 | 58.4 | 12937 | 27542 | 10 % to 20 % |
| 8 | Combine Harvesters | 92.4 | 545.0 | 74208 | 245833 | - |
| 9 | Thresher | 22.5 | 22.9 | 13236 | 14067 | - |
| 10 | Pump set | 23.1 | 22.6 | 12552 | 3384 | < 10 % |
| | TOTAL | 24.8 | 33.1 | 11342 | 14183 | < 10 % |

The average cost of combine harvester was above Rs 18 lakh and generally it was purchased for custom hiring either by the large farmers or other intermediaries in the rural areas. RKVY programme provided subsidy for combine harvester in few states. Looking at the usage of combine harvester, the statistics in the table shows that on average combine harvester was used for around three months in a year and harvested area by a combine was around 550 acres. The average value of own usage was around Rs 74 thousand while earnings from custom hiring was Rs 2.5 lakh per annum. Per acre imputed value of area harvested by a combine turns out around Rs 600. The thresher was used for around 23 days, threshing 23 acres on average during the reference year with an imputed value of Rs 1200 per acre and thresher was used almost equally for own use and hiring out. The pump set on the other hand was mostly used for own area irrigation and one pump set irrigated around 23 acres with an imputed value of Rs 700 per acre during the reference year. On enquiring the farmers of how much productivity has been enhanced with the increased usage of these mechanical implements, majority of the farmers indicated mostly 10 per cent increase in productivity (Table 3.1c) due to usage of these implements.

Table 3.1d: Impact of agricultural mechanisation on crop productivity

| Sl. No. | Name of the implements | No change | Less than 10% | 10% to 20% | 20% to 30% | Above 30% |
|---|---|---|---|---|---|---|
| 1 | Tractor/mini tractor | 4.3 | 42.9 | 35.7 | 12.9 | 2.9 |
| 2 | Rotavator | 8.3 | 37.8 | 31.4 | 10.9 | 9.0 |
| 3 | Tiller | 5.7 | 43.2 | 32.3 | 9.4 | 4.2 |
| 4 | Cultivators | 17.0 | 48.9 | 29.8 | 2.1 | 0.0 |
| 5 | Ploughs | 25.0 | 7.1 | 21.4 | 10.7 | 32.1 |
| 6 | Harrow | 12.8 | 51.3 | 30.8 | 0.0 | 0.0 |
| 7 | Seed drill | 11.5 | 26.9 | 34.6 | 9.6 | 11.6 |
| 8 | Sprayers | 4.8 | 51.1 | 17.0 | 8.0 | 3.7 |
| 9 | pump set | 3.6 | 60.3 | 25.2 | 3.6 | 3.4 |
| | TOTAL | 7.6 | 45.3 | 25.8 | 8.3 | 6.3 |

Table 3.1d presents the frequency table on impact of agricultural mechanisation on crop productivity based on farmers' opinion. A majority of farmers averaged around 45 per cent indicated about 10 per cent increase in their productivity after buying the subsidised implements under RKVY programme, e.g. tractor, rotavator, tiller, cultivator, harrow, sprayer and pump set. Around one fourth of the farmers opined that their productivity increased between 10 to 20 percent while only around 15 per cent indicated more than 20 per cent increase in their productivity. On the opposite, around 8 per cent households indicated that these implements did not make any difference in their production or productivity level. Among the implements, plough and cultivator had the highest number of households, 25 and 17, per cent, respectively who indicated no change in their productivity while it was minimum for pump set and tractor in which case only less than 5 per cent households indicated no change in their productivity. In the latter case, majority of households indicated up to 20 per cent increase in their productivity after buying these implements. We further asked the farmers how these implements have helped them in their agricultural operations. A majority of selected farmers pointed out that implements like tractor rotavator, tiller, cultivators, plough, harrow, seed drill, combine harvester and thresher solved their labour problem to some extent and enabled the farmers completing their sowing, harvesting and transportation operations well in time (Table 3.1e). The mechanical and manual sprayers helped the farmer controlling weed and thus helped their good plant growth. Similarly, pump sets by supplying water on time enabled them complete their on- time sowing operations. Combine harvesters helped all the selected users overcome the scarcity of labour problem during the peak harvesting season and also reduced cost of harvesting operations. Rotavator, seed drill, harrow and cultivators helped the farmers in controlling weed and achieving good plant growth. To summarise, a majority of the farmers indicated that the investment in mechanical implements helped their agricultural operations by saving labour, enabling timely sowing and harvesting operations, controlling weed and thus helping them achieving good plant growth rate.

Table 3.1e: Benefits derived from agricultural mechanisation - Implement wise
(% of hh)

| Sl. No. | Name of the implements | Solved labor problem | Enabled timely operations | Saved water | Helped in controlling weed | Helped in good plant growth | Reduced Drudgery | Helped in transportation | Reduced cost of Cultivation | Increased cropping intensity |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Tractor/mini tractor | 24.6 | 44.9 | 2.9 | 1.5 | 8.7 | 0.0 | 4.4 | 10.1 | 2.9 |
| 2 | Rotavator | 43.1 | 24.8 | 1.3 | 8.5 | 15.7 | 1.3 | 0.0 | 3.3 | 2.0 |
| 3 | Tiller | 36.5 | 33.2 | 1.1 | 2.3 | 15.7 | 1.7 | 0.0 | 9.0 | 0.6 |
| 4 | Cultivators | 19.6 | 45.7 | 4.4 | 13.0 | 10.9 | 0.0 | 0.0 | 6.5 | 0.0 |
| 5 | Ploughs | 33.3 | 47.6 | 4.8 | 4.8 | 0.0 | 9.5 | 0.0 | 0.0 | 0.0 |
| 6 | Harrow | 19.4 | 41.7 | 2.8 | 11.1 | 22.2 | 0.0 | 0.0 | 0.0 | 2.8 |
| 7 | Seed drill | 39.1 | 19.6 | 4.4 | 6.5 | 28.3 | 0.0 | 0.0 | 2.2 | 0.0 |
| 8 | Sprayers | 15.4 | 28.7 | 1.5 | 4.4 | 44.9 | 0.0 | 0.0 | 4.4 | 0.7 |
| 9 | Combine harvesters | 81.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 18.2 | 0.0 |
| 10 | Thresher | 57.4 | 32.4 | 2.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 7.4 |
| 11 | Chopper | 70.8 | 20.8 | 0.0 | 8.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 12 | Pump set | 8.7 | 61.0 | 16.1 | 0.5 | 12.3 | 0.3 | 0.0 | 0.8 | 0.3 |
| | TOTAL | 30.0 | 37.7 | 5.9 | 3.8 | 14.0 | 1.9 | 0.2 | 4.1 | 2.4 |

Annex Table 3.1.2A presents a comparative picture of usage of farm equipments in different regions. Tractor procured at subsidised rate was used for 42 days per annum in south for cultivating around 28 acres, compared to its use for around 60 days to cultivate more than 150

acres in the west, 44 days to cultivate 160 acres in the east and around 38 days for 146 acres in the north. Similarly, rotavator was used for 23 days in the south, 45 days in the west, 16 days in east and 21 days in the north cultivating 48 acres in south, 36 acres in the west, 49 acres in the east and 95 acres in the north. Pump set irrigated around 19 acres in the south and east each compared to 24 acres in the west and north. Area cultivated by tillers varied between 12 acres in the south, 29 acres in north and 44 to 46 acres in the east and west. Seed drill was used for 40 acres in the south, 27 acres in west, 21 acres in east and 76 acres in the north. At the aggregate, mechanical implements were used for cultivating 35 acres per implement per annum in the south, 27 acres in the west and east and 50 acres in the north. The numbers of days these implements were used averaged at 17 days in east and north and almost double of that (31 to 34 days) in the south and west. The average imputed value of all implements for owned and hired use per acre works out to Rs 633 in the east and north-east, Rs 648 in the north, Rs 745 in the south and Rs. 1090 in the west. About the impact of mechanical implements on crop productivity, last column of Table 3.1.2A provides model value of farmers' opinion about percentage increase in crop productivity. In most of the implements, productivity change lied between less than 10 per cent and 10 to 20 per cent except in the case of rotavator, seed drill, thresher and pump sets in south where farmers opined a combined effect of all these implements to around 50 per cent increase in productivity.

Among the selected states, tractor was used for highest numbers of days in Maharashtra 60 days, followed by Chhattisgarh 56 days, Karnataka, 46 days, Bihar 45 days, Andhra Pradesh 44 days, Jammu & Kashmir 41 days and Tamil Nadu 39 days. The area cultivated by a tractor during one year's period was highest in Maharashtra 180 acres, followed by Jammu & Kashmir 166 acres, Uttar Pradesh 103 acres and Chhattisgarh 75 acres. It was as low as only 12.5 acres in Karnataka, 20 acres in Bihar, 30.5 acres in Tamil Nadu ad 36 acres in Andhra Pradesh. Rotavator cultivated 196 acres area in a year in Jammu & Kashmir, 158 acres in Madhya Pradesh, 114 acres in Orissa, 100 acres in Uttar Pradesh and 84 acres in Punjab while it was used for highest numbers of 70 days in Madhya Pradesh and above 40 days in Gujarat, Maharashtra, Orissa and Jammu & Kashmir. Similarly, the sowing equipments like tiller, cultivator, plough and harrow were used with different intensity in different states with highest area of 78 acres cultivated by tiller in Orissa, 78 acres by cultivator in Uttar Pradesh, 180 acres by plough in Madhya Pradesh and 120 acres by harrow in Orissa. In the case of pump set installed on subsidy, highest area irrigated by a pump set in a year was 28 acres in Madhya Pradesh and Uttar Pradesh while intensity of pump set in Haryana was only 2 acres and 10 acres in Maharashtra during the reference period. In most of the implements, average increase in productivity was recorded at less than or between 10 to 20 per cent observed by the selected households.

These results are further verified by statistics in Annex Table 3.1.3A. Around 3/4$^{th}$ percentage of households in all the regions were of the view that productivity in agriculture has increased up to 20 per cent after making investment in mechanical implements. Only in the case of south, around 20 per cent households indicated more than 30 per cent increase in productivity due to investment in subsidised mechanical implements. In all other three regions, the percentage of household who indicated more than 30 per cent increase in productivity was less than 5 per cent. On the other hand, households saying no change in productivity after making investment in mechanical implements, remained less than 10 per cent in all the region accept in the north where around 12 per cent households were of the opinion that impact of mechanical implements

was completely missing in terms of better productivity. Last but not the least, majority of the selected farmers pointed out that mechanisation solved their forever labour scarcity problem, enabled timely operations in the field and thus helped them in achieving better plant growth. These findings were more or less true in all four regions (Table 3.1.4A).

Thus to conclude although there were wide variations across various regions, on average in most of the implements, productivity change lied around 10 to 20 per cent. Mechanisation in addition to raising farmers' productivity, it proved to be an effective tool in their hands to overcome the problem of non availability of labour during the sowing and harvesting seasons. This has provided some succour to the farmers especially at a time when the farmer has to compete in the labour market in the presence of boom in the construction sector and the tightening of the labour market taking place due to implementation of the famous rural employment programme known as MGNREGA.

## 3.2 Crop Development

Crop development mainly addresses augmentation of agricultural production in a sustainable way. The main focus of crop development under RKVY programme has been towards increasing productivity and growth through efficient use of inputs and better management of natural resources viz., improving soil health by balanced use of micro and major nutrients, use of bio-fertilizer and bio agents, adoption of high yielding variety seeds and adoption of area based incentive approach. As per our first report based on website data, out of total expenditure incurred on RKVY during the $11^{th}$ Five Year Plan approximately 9 percent was spent on crop development. Out of total expenditure under crop development sector, highest 32 per cent was spent in the west and central region, followed by east and north east (around 31.7 per cent), southern region (23 per cent) while north region recorded the lowest amount spent only 13 percent of total expenditure under crop development.

### 3.2.1 Details of Interventions under Crop Development

Table 3.2a presents details of interventions carried out and benefits received under crop development sector by the selected households. Broadly, six types of benefits were availed by the households under RKVY crop development programme, namely good quality seeds/planting materials, fertilizers and other plant protection materials, micro nutrients, bio-fertilizers and bio-control agents, area based incentives and other land developments materials. Among all selected households all over the country, around 35 per cent availed benefits under the broad category of crop development. This indicates that every third selected household had availed some subsidy under crop development. Although programme intervention made under crop development was much higher compared to only 21 per cent of the households in the case of mechanisation, but the scale in terms of size of the intervention was much larger in mechanisation as compared to crop development. Whereas, the amount of investment by the selected households in the case of mechanisation was Rs 85 thousand per beneficiary household it was less than Rs 2 thousand in the case of crop development. Further in the case of mechanisation, the subsidy proportion was 37 per cent that accounted for Rs 32 thousand subsidy amount per beneficiary household, while in the case of crop development although the percentage was 77 but the amount of subsidy disbursed per beneficiary household was only Rs 1.5 thousand. It is pertinent to note that

whereas in the case of mechanisation, households created new assets in order to avail the subsidy benefit but in crop development subsidy was given for the components like seed, fertiliser, bio-fertiliser and micro nutrients most of which were used by the households for growing their usual crops.

Among different components, the highest numbers of households (around 16 per cent) obtained subsidy for seeds and planting materials. The beneficiary households spent Rs 2425 on seeds and planting material for which they received subsidy amount of Rs 1879 that was around 77.5 per cent of the total cost incurred. In many cases households were given the planting material in place of subsidy in monetary terms. On average, 39 kg of seed or planting material was supplied per beneficiary household and 1.5 acres per household area was covered by the subsidised seed and planting material. Fertiliser/plant protection materials and micronutrients were provided to around 8 and 5 per cent of the selected households, respectively while bio-fertilisers and other area based incentives were given to around 2 per cent households. The highest amount of subsidy was given for area based incentives, Rs 2729 per beneficiary household as also the area covered under the area based incentive was highest, 2.2 acres per beneficiary household. About farmers' reaction to the impact of use of better quality seed, micro nutrients and bio and plant protection fertiliser, majority of the beneficiary households reported around 10 percent enhancement in their productivity as a result of use of these inputs during the reference period.

Table 3.2a: Interventions made under crop development

| Sl. No. | Benefits | % of beneficiaries | Area covered per HH in acres | Quantity supplied per HH in Kgs. | Actual cost (Rs. Per HH) | Subsidy (Rs. Per HH) | Subsidy as a per cent of actual cost | % increase in productivity |
|---|---|---|---|---|---|---|---|---|
| 1 | Seeds / planting materials | 15.7 | 1.5 | 39.2 | 2425 | 1879 | 77.5 | < 10 % |
| 2 | Fertilizers and plant protection | 8.4 | 1.8 | 70.1 | 1386 | 995 | 71.8 | < 10 % |
| 3 | Micro nutrients | 4.7 | 1.8 | 51.3 | 786 | 619 | 78.7 | < 10 % |
| 4 | Bio-fertilizers and bio-control agents | 2.3 | 1.0 | 129.6 | 616 | 555 | 90.0 | < 10 % |
| 5 | Area based incentives | 1.6 | 2.2 | 13.1 | 3381 | 2729 | 80.7 | < 10 % |
| 6 | Others | 1.9 | 1.4 | 83.9 | 4322 | 3379 | 78.2 | 10 % to 20 % |
| | TOTAL | 34.7 | 1.6 | 55.6 | 1976 | 1525 | 77.2 | < 10 % |

Further details of RKVY intervention about provision of crop developmental benefits to the selected households in the four regions are provided in Annex Table 3.2.1A. As against the aggregate average of 35 percent of the selected households participating in crop development activities, the proportion was highest in the case of east and north east, where every alternate household had obtained some subsidy under crop development. Although. the subsidy amount was 90 per cent of the intervention cost but the volume of investment was only Rs 1614 and the subsidy amount was Rs 1458 per beneficiary household. Area covered on average was 1.4 acres and quantity of inputs supplied per beneficiary households was 53 kg. The highest intervention in east and north-east was for seeds/planting material where 23 per cent of the selected households received subsidy and 14 per cent of the households received subsidy for fertiliser and plant protection. The subsidy provision made under crop development was highest in the south

region, Rs 2431 per beneficiary household where around 24 per cent of the households received subsidy in that region. The subsidy amount was lowest Rs 804 per beneficiary household in the north region where only 18 per cent of the selected households received subsidy under crop development. Among different components of subsidy scheme, highest subsidy was given for area based incentive Rs 7806 in the north and Rs 4379 in the west and central region. Among all the four regions highest numbers of households availing subsidy under crop development was for seeds and planting material, followed by fertiliser/plant protection, micro nutrients and bio fertilisers. Thus, the main purpose of crop development programme was to provide better quality seeds to the farmers to increase their productivity and improve and strengthen the soil quality to make the agriculture sustainable. The investment requirement from farmers for undertaking activities of crop development was small and the nature of investment was not incremental. It also involved small subsidy amount on the part of the state government, thereby most of the state governments under took this activity at a large scale to register and showcasing implementation of RKVY programme in their respective states.

Among the southern states, 32 per cent households participated in the programme in Karnataka, Tamil Nadu and Andaman Nicobar Island each, 28 per cent in Kerala, 21 per cent in Puducherry, 11 per cent in Goa and only 3 per cent in Andhra Pradesh. The subsidy amount varied considerably among these states with highest amount of above Rs 4.5 thousand per beneficiary household in Puducherry and Tamil Nadu, above 3 thousand in Goa, around Rs 2 thousand in Andaman Nicobar, Rs 1610 in Kerala, Rs 1110 in Andhra Pradesh and only Rs 716 in Karnataka among the selected households. Notably, in Andhra Pradesh and Puducherry subsidy was given only for seeds and planting materials. The subsidised seed, fertiliser and other material was provided on average for 7 acres in Goa, 4.5 acres in Andhra Pradesh, above 2 acres in Karnataka, Tamil Nadu, Puducherry and Andaman Nicobar and around 1 acre in Kerala. In the west and central region, at the aggregate, around 30 per cent of the selected households availed subsidy for crop development activities and the subsidy amount averaged at Rs 1600 per beneficiary household (Annex Table 3.2.1A). The subsidy amount was highest for area based incentives, Rs 4.4 thousand and other crop development activities, Rs 5 thousand. Among states in this region, the subsidy amount varied from Rs 12 thousand in Chhattisgarh, Rs 2 thousand in Gujarat and Maharashtra and around Rs 860 in Madhya Pradesh and Rajasthan. The percentage of subsidy to total intervention cost varied across the states from 56 percent in Madhya Pradesh to 96 percent in Chhattisgarh. The area covered under subsidy scheme varied between one to three acres only among different states in the western region.

As mentioned above, the highest intervention under crop development took place in the east and north eastern region where around 56 percent selected households participated. The participation was so high in this region because in Bihar, Orissa and many other states multiple interventions were made, e.g., same households were given seed/planting material as well as fertilizer and plant protection that led to double counting of the households in our data base. In some other states the programme was implemented as a composite programme providing the farmers a combination of seeds, planting material, plant protection, bio-fertilizer and micro nutrients. Almost all the selected households participated in Bihar and Orissa, around 70 per cent participated in Mizoram and Nagaland, around 60 per cent in Tripura and Nagaland, 40 per cent in Jharkhand, above 30 per cent in Arunachal Pradesh while less than 20 per cent participated in the other eastern/north-eastern states. The subsidy amount varied from above Rs 7 thousand in

Mizoram, above Rs 2 thousand in Andhra Pradesh and Nagaland, around Rs 1 thousand in Sikkim and around Rs 600 or less than that in Assam, Bihar, West Bengal, Jharkhand, Orissa and Tripura while there was no intervention under crop development in Manipur and Meghalaya. Subsidy as a percentage of intervention varied from 28 percent in Tripura to almost 100 percent in Assam and Nagaland. The area covered under subsidy scheme ranged less than one acre to four acres and material supplied varied between 15 kg to 150 kg per beneficiary households in the eastern states.

In the Northern region, around 63 per cent of the selected households participated in crop development in Haryana, 31 per cent in Punjab, 25 per cent in Uttrakhand, 16 per cent in Himachal Pradesh and only 4 per cent in Uttar Pradesh while none of the households were given subsidy under crop development in Jammu and Kashmir. As was mentioned in the beginning, northern region had the least participation in crop development. Per household subsidy amount under crop development was also nominal, Rs 371 in Himachal Pradesh, Rs 451 in Uttrakhand, Rs 631 in Haryana, Rs 907 in Punjab and Rs 2716 in Uttar Pradesh among the selected households. Except Uttar Pradesh, none other states in this region had area based incentive interventions. Most of the states including Haryana, Himachal Pradesh and Punjab made intervention in terms of providing seeds/planting materials and fertilizers under the programme. The area covered per household under subsidy scheme varied between less than one acre to more than four acres and quantity of inputs supplied per household varied from 8 kg to 40 kg.

Households in most of the states in the south region indicated 10-20 per cent increase in productivity as a result of supply of better seeds, fertiliser/bio-fertiliser, plant protection and micro nutrients. In the west and central region, selected farmers in Gujarat and Rajasthan indicated 10-20 per cent increase in productivity while rest of the states indicated less than 10 per cent increase in yield rate as a result of better input usage. In the eastern and northern region most of the farmers indicated less than 10 per cent increase in crop productivity due to crop development intervention under RKVY programme. Last but not the least, provision of inputs or subsidy under crop development included a long list of crops viz., cereals, pulses, oilseeds, fruits & vegetables and other commercial crops. For instance, in the southern region, mostly vegetables were covered in Andaman Nicobar Island, coconut and paddy in Kerala and pulse and oilseed crops in Karnataka and Tamil Nadu. In the western and central region, paddy crop was covered in Chhattisgarh, cotton, maize and vegetables were covered in Maharashtra, paddy, coarse cereals and pulse crops were covered in Madhya Pradesh, while bajra, maize and oilseed crops were provided with subsidy in Gujarat. In the eastern and north-eastern region, paddy was the main crop in Jharkhand, Tripura and Mizoram, maize and wheat in Sikkim, sunflower, paddy and maize in Orissa, paddy and wheat in Bihar and West Bengal and vegetables in Nagaland. Among the northern states, subsidy provision was made for bajra, wheat and paddy crops in Haryana, maize and vegetable crops in Himachal Pradesh, wheat and green fodder in Punjab, maize, wheat sugarcane and paddy in Uttar Pradesh and mainly pulse crops in Uttrakhand.

### 3.2.2 Impact of Crop Development on Crop Productivity

Table 3.2b presents the frequency table on impact of crop development activities on crop productivity based on farmers' opinion. A majority of farmers averaged around 39 percent indicated 10 percent increase in their productivity with the use of subsidised seeds/planting materials, fertilizers, micronutrients and other area based incentives. Around one fourth opined

that their productivity increased between 10 to 20 percent while around 13 percent indicated more than 20 percent increase in their productivity. On the opposite, around 6 percent households indicated that these interventions did not make any significant difference in their production or productivity level. Among the households who opined that there was no change in the productivity, the highest 13 percent of them obtained area based incentives, while around 3 per cent of them availed subsidy for micronutrients and bio-fertilizers. In the latter case, majority of farmers indicated up to 20 percent increase in their productivity as result of use of the above mentioned inputs. Likewise, majority of the households who availed area based incentives reported up to 10 percent increase in productivity. Among different regions (Annex Table 3.2.2A), highest percentage of selected farmers (more than 30 per cent) in south region indicated 10 to 20 per cent increase in productivity as a result of crop development. In other regions majority of the farmers indicated less than 10 per cent increase in productivity due to improved package of inputs. The highest 10 per cent farmers in the north region, 8 per cent in the west and central and 5 per cent in the east and south propounded no change in their productivity after crop development intervention.

Table 3.2b: Impact of crop development on crop productivity

| Sl. No. | Benefits | No change | Less than 10% | 10% to 20% | 20% to 30% | 30% and above | Availed but not responded | Total |
|---|---|---|---|---|---|---|---|---|
| 1 | Seeds / planting materials | 8.6 | 42.7 | 27.3 | 8.2 | 8.0 | 5.2 | 100.0 |
| 2 | Fertilizers and plant protection | 4.6 | 36.8 | 18.7 | 4.4 | 4.8 | 30.7 | 100.0 |
| 3 | Micro nutrients | 2.3 | 36.0 | 28.8 | 6.7 | 3.9 | 22.3 | 100.0 |
| 4 | Bio-fertilizers and bio-control agents | 3.2 | 33.5 | 17.0 | 3.7 | 4.3 | 38.3 | 100.0 |
| 5 | Area based incentives | 13.4 | 53.7 | 20.9 | 3.7 | 3.0 | 5.2 | 100.0 |
| 6 | Others | 1.3 | 17.0 | 17.7 | 5.9 | 8.5 | 49.7 | 100.0 |
| TOTAL | | 6.3 | 38.9 | 23.9 | 6.4 | 6.3 | 18.3 | 100.0 |

## 3.3. Horticulture

Horticulture sector remains one of the thrust areas of RKVY programme. According to our first report based on RKVY website data, the main focus of RKVY under horticulture sector was in three area, viz., area expansion, development of horticulture farms/facilities and some additional schemes for vegetables, fruits etc. The total expenditure under horticulture during the 11$^{th}$ Five Year Plan was Rs. 2573 crore, which turns out approximately 9 per cent of the total expenditure under RKVY. Expenditure under horticulture sector was highest in west and central region amounting to approximately 34 per cent of the total expenditure on horticulture sector followed by south region 29 per cent, east and north-east 19 per cent and north region 17 per cent. According to our field observations, the subsidy scheme under horticulture had two components, first creating infrastructure for horticultural crops like field nursery, poly house, green house etc., and second like crop development providing seedling material, fertiliser and other nutrients to encourage farmers to grow more horticultural crops.

### 3.3.1 Details of Interventions under Horticulture Infrastructure

Table 3.3a presents details of interventions carried out under horticulture sector facilitating farmers to invest in infrastructure for the expansion of area under horticultural crops and raising their productivity. In most of the states, the horticulture interventions were carried out by their respective horticultural departments who were aided by other allied departments like floriculture and officials of civil engineering. Investment in horticultural infrastructure by the selected farmers included, field nursery, poly house, shade net, green house, plastic crates, storage bins, grading/packing equipments, processing equipments and refrigerated vans. As against 35 per cent selected households participating in crop development and 21 per cent in mechanisation, only 9 per cent of the selected households participated in horticulture infrastructure building. However, against the per beneficiary household subsidy amount of Rs 1.5 thousand in crop development and Rs 32 thousand in mechanisation, the amount of subsidy per beneficiary household in the case of horticulture infrastructure was Rs 42 thousand. As infrastructure building is more capital intensive, investment under taken by the households in horticulture sector was Rs 73 thousand against Rs 85 thousand in mechanisation and Rs 2 thousand in crop development. The subsidy amount as a percentage of investment was 57.5 in horticulture infrastructure as against 77 per cent in crop development and 38 per cent in mechanisation.

Table 3.3a: Interventions made under horticulture infrastructure

| Sl. No. | Details of infrastructure created | % of bene-ficiaries | Actual Cost in Rs. | Subsidy as a % of cost | Impact of intervention (%) | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Increase in productivity | Decrease in cost | Increase in income | Decrease in post harvest losses |
| 1 | Field Nursery | 2.0 | 17453 | 75.4 | <10% | No change | 20% to 30% | No change |
| 2 | Poly House | 0.7 | 63005 | 68.2 | <10% | No change | 10% to 20% | <10% |
| 3 | Shade Net | 0.7 | 56485 | 82.8 | <10% | <10% | <10% | <10% |
| 4 | Green House | 0.6 | 285476 | 47.2 | <10% | <10% | 10% to 20% | <10% |
| 5 | Plastic crates | 1.2 | 37633 | 78.0 | No change | <10% | <10% | <10% |
| 6 | Storage bins | 0.6 | 3919 | 92.7 | No change | <10% | <10% | No change |
| 7 | Grading/packing Equipments | 0.04 | 18500 | 52.7 | Insufficient observations | Insufficient observations | Insufficient observations | Insufficient observations |
| 8 | Processing Equipments | 0.01 | 2850 | 100.0 | Insufficient observations | Insufficient observations | Insufficient observations | Insufficient observations |
| 9 | Refrigerated Van | 0.04 | 190250 | 99.9 | Insufficient observations | Insufficient observations | Insufficient observations | Insufficient observations |
| 10 | Any other | 3.0 | 97482 | 52.7 | <10% | <10% | 10% to 20% | <10% |
| Total | | 8.7 | 73290 | 57.5 | <10% | <10% | <10% | <10% |

Among different types of infrastructure, investment in ripening chambers, pre cooling, grading, packing and processing equipments and refrigerated vans was nominal as only one or two households in the entire sample made investment in these items even though subsidy amount for the intervention was substantial for the participating households. The highest number of households, around 2 per cent of the aggregate participated in field nursery while around 1 per cent households participated in other infrastructure activities, viz., poly house, shade net, green house, plastic crates for transportation and storage bins, each. Investment by the participating households was highest in the green house, the average amount being Rs 2.9 lakh whereby subsidy amount given was Rs 1.3 lakh per beneficiary household that was slightly less than 50 per cent of amount of intervention. Investment in the poly house was Rs 63 thousand, followed by shade net Rs 56 thousand, plastic crates Rs 38 thousand and field nursery Rs 17 thousand per participatory household. The subsidy given for these items averaged at Rs 47 thousand for shade net, Rs 43 thousand for poly house, Rs 29 thousand for plastic crates and Rs 13 thousand per

beneficiary household for creating field nursery. Refrigerated vans were provided at almost 100 per cent subsidy to only three households where the subsidy amount per beneficiary household was Rs 1.9 lakh. At the aggregate, an average amount of Rs 42 thousand of subsidy was given that was 58 per cent of the total intervention cost of Rs 73 thousand per beneficiary household for the generation of horticultural infrastructure. The last four columns in Table 3.3a present the impact of infrastructure intervention on crop productivity, cost of cultivation, household income and the post harvest losses. The impact of intervention on fruits and vegetable cultivation and other indicators was around 10 per cent achievement in terms of higher productivity, enhancement in household income and reduction in post harvest losses.

Glancing through the regional details in Annex Table 3.3.1A, the highest numbers of households having intervention in horticultural infrastructure was in the east and north-eastern region 11 per cent, followed by south region 9.5 per cent, west 7 per cent and north 6 per cent. The extent of intervention was highest in west region Rs 1.5 lakh, where beneficiary households received subsidy amount of Rs 76 thousand. In the south region intervention amount per household was Rs 1.1 lakh while subsidy amount was Rs 49 thousand per beneficiary household. In the east and north-east region the intervention was only Rs 33 thousand while subsidy amount was Rs 30 thousand that was almost 90 per cent. In the north region investment amount was Rs 49 thousand where subsidy given averaged at Rs 25 thousand per beneficiary household. Thus, subsidy percentage was lowest in the southern region only 43.5 percent, it was 54 per cent in western region, 52 per cent in north region and it was highest 90 per cent in eastern region. Among various infrastructure components, subsidy for field nursery was provided to the highest numbers of households, 4 per cent in the south and 3 per cent in the east while subsidy for green house was provided to 1 per cent households in the west and 1 per cent households for the shade net in the north. Subsidy amount was highest for green house, Rs 5.7 lakh in the south and Rs 2.2 lakh in the north, Rs 1 lakh for shade net and plastic crates, each in the east and Rs 1.2 lakh on poly house in the north.

Looking into the state wise intervention, percentage of households who participated in horticultural infrastructure building in the south region, included 26 per cent in Andhra Pradesh, 14 per cent in Kerala, 7 per cent in Karnataka, 6 per cent in Tamil Nadu and lees then 1 per cent in Andaman Nicobar Island. The subsidy amount paid to the selected beneficiary household averaged at Rs 5.6 lakh in Andaman Nicobar, Rs 1.5 lakh in Karnataka, Rs 1 lakh in Tamil Nadu, Rs 20 thousand in Andhra Pradesh and only Rs 8 thousand in Kerala. Looking at the components for which highest subsidy amount was given; in Karnataka 12.7 lakh per beneficiary household and in Tamil Nadu Rs 2.9 lakh per beneficiary household was paid for the green house. In Andaman Nicobar, Rs 5.6 lakh was paid for refrigerated van while in Andhra Pradesh Rs 20 thousand was paid for plastic crates and in Kerala Rs 3 thousand was paid for the field nursery per beneficiary household. In terms of subsidy as a percentage of total investment, Andaman Nicobar received 100 per cent subsidy, Andhra Pradesh 55.4 per cent, Karnataka 43.6 percent and Tamil Nadu 37.8 per cent to the total intervention cost.

In the western region, household participation in horticulture infrastructure building was far less than that of southern region. Around 17 per cent households participated in horticulture infrastructure in Madhya Pradesh, followed by 9 per cent in Rajasthan and only around 2 per cent in other west region states, viz., Maharashtra, Gujarat, and Chhattisgarh. In Madhya Pradesh, around Rs 80 thousand per beneficiary household subsidy was provided to around 10

per cent of the surveyed households mainly for godowns, scientific storage and fencing of the field. Subsidy was also provided for green house (Rs 11 thousand), shade net (Rs 7 thousand) and plastic crates (Rs 6 thousand), while overall subsidy amount per beneficiary household in the state was Rs 51 thousand. In Rajasthan only one household was provided subsidy amount of Rs 4 lakh for green house while around 5 per cent of the surveyed households were provided subsidy for installing solar system for which Rs 3 lakh was provided to each beneficiary households. At the aggregate, around 9 per cent surveyed households were provided with Rs 2 lakh per household subsidy in Rajasthan. In Maharashtra, subsidy for horticulture infrastructure was given only for storage bins, an amount of Rs 5 thousand to only 1 per cent of the selected households. Similarly, in Gujarat, subsidy under horticulture infrastructure was given only to one household for shade net that was Rs 60 thousand, one household for green house who was given less than Rs 2 thousand and four households for drip irrigation with Rs 21 thousand each. The aggregate subsidy for the state stood averaged at Rs 24 thousand per beneficiary household. Subsidy amount in Chhattisgarh averaged only Rs 4 thousand given mainly for the green house to four households at the aggregate. In the entire west and central region no subsidy was given for field nursery and poly house. The average investment on horticulture infrastructure in the west and central region was Rs 1.5 lakh and subsidy amount given to the beneficiary farmers averaged at Rs 79 thousand that was around 54 per cent of the total investment by the beneficiary households.

As mentioned above, in the east and north eastern region, only 11 per cent selected households participated in horticulture infrastructure. Highest intervention was by Manipur where 43 per cent households participated followed by Sikkim, around 25 per cent, Mizoram 18 per cent, Arunachal Pradesh 17 per cent, Meghalaya 11 per cent, Orissa 8 per cent, Assam 7 per cent and West Bengal and rest of states less than 2 per cent. The subsidy amount varied from around Rs 82 thousand in Sikkim, Rs 40 thousand in Jharkhand, Rs 29 thousand in Arunachal Pradesh, Rs 25 thousand in Manipur, Rs 15 thousand in Assam, West Bengal and Orissa each, Rs 7 thousand in Mizoram and Rs 6 thousand in Bihar. In Arunachal Pradesh a sum of Rs 84 thousand per beneficiary household was given for plant nursery to 3 selected households. In Jharkhand Rs 1.2 lakh per beneficiary subsidy was given for the shade net to 5 selected households. In Manipur Rs 1.7 lakh subsidy amount was given for green house and Rs 1 lakh was given for shade net per beneficiary household to 4 and 8 households, respectively. In Orissa, two households received subsidy of Rs 88 thousand per household for plastic crates and one household received Rs 75 thousand for shade net. In Sikkim, 17 selected households received subsidy amounting Rs 1.2 lakh per beneficiary for plastic crates, 2 households received Rs 1.5 lakh per household for shade net and 8 and 7 households received a sum of Rs 90 thousand each for poly house and green house. In the entire north-east region participation in horticulture infrastructure was better than any other sector indicating the hilly terrain in the north-east that is more suitable for horticulture compared to other field crops.

In the Northern region, only 6 per cent of the selected households participated in horticulture infrastructure varying from 19 per cent in Jammu and Kashmir, 14 per cent in Haryana, 10 per cent in Punjab, 5 per cent in Himachal Pradesh and only 1 per cent in Uttar Pradesh while none of the selected households were given subsidy under horticulture infrastructure in Uttrakhand. Per household subsidy amount under horticulture infrastructure also varied greatly. Subsidy amount was only Rs 3 thousand per beneficiary household in Haryana that was entirely given for

plastic crates. In Himachal Pradesh subsidy amount of Rs 2.2 lakh per household was given for establishing green house and Rs 1.7 lakh for the poly house. At the aggregate, 5 per cent of the beneficiary households in Himachal Pradesh obtained per household subsidy of Rs 1.6 lakh. In Jammu and Kashmir, subsidy was given for poly house, shade net and storage bins that averaged at Rs 13 thousand per beneficiary households. In Punjab only one household was given subsidy of Rs 1.8 lakh for poly house while 8 per cent of the selected households were given Rs 11 thousand per beneficiary household subsidy for plastic crates. In Uttar Pradesh only few households were given less than Rs 2 thousand field nursery while in Uttrakhand no intervention was carried out for horticultural infrastructure.

### 3.3.2 Impact of Horticultural Infrastructure on Crop Productivity and Farmer's income

Table 3.3b presents the frequency table on impact of horticulture infrastructure activities on crop productivity based on farmers' opinion. Around 27 percent farmers who obtained benefit from infrastructure development indicated 10 percent increase in their productivity with the use of field nursery and other facilities like shade net, green house, poly house etc. As infrastructure building in terms of protected cultivation was not taken up at a large scale under RKVY, the extent of productivity increase was not as much as desired from the precision farming. Nevertheless, productivity enhancement up to 30 per cent was indicated by more than 60 per cent households while around 25 per cent indicated no change in productivity due to the activities of infrastructure building. However, the households who opined that there was no change in the productivity, a majority of them obtained benefits for storage bins, plastic crates and other such activities that did not have any direct relation with the crop productivity but such activities reduced the cost of production/marketing and also reduced the post harvest losses. Among different regions (Annex Table 3.3.2A), highest percentage of selected farmers (around 24 per cent) in east and north-east region indicated 20 to 30 per cent increase in productivity as a result of horticulture infrastructure development. In other regions majority of the farmers indicated less than 10 per cent increase in productivity due to improved infrastructure in the horticulture sector. The highest 52 per cent farmers in the west and central region, 24 per cent in north region, 13 per cent in the east and north-east region and 4 per cent in south region propounded no change in their productivity after intervention. The highest 52 per cent in the west indicated no change in productivity as in the west most of the intervention made belonged to godowns, scientific storage, fencing of the field and installing solar system that had better impact in terms of increase in income and reduction in post harvest losses.

Table 3.3b: Overall impact of horticultural infrastructure intervention (All India)

| Sl. No. | Total Impact of intervention | % beneficiaries reported | | | | | |
|---|---|---|---|---|---|---|---|
| | | No change | Less than 10 per cent | 10 to 20 per cent | 20 to 30 per cent | Above 30 per cent | Not answered |
| 1 | Increase in productivity | 24.9 | 26.8 | 16.3 | 12.9 | 11.9 | 7.0 |
| 2 | Decrease in cost | 24.2 | 39.8 | 13.6 | 9.0 | 8.4 | 6.5 |
| 3 | Increase in income | 12.4 | 30.1 | 27.4 | 13.3 | 11.1 | 7.0 |
| 4 | Decrease in post harvest losses | 24.6 | 37.9 | 14.2 | 8.3 | 8.9 | 6.9 |

Measuring the impact in terms of decrease in cost, increase in income and decrease in post harvest losses it is observed from the statistics in Table 3.3b that like in the case of productivity

more than 50 per cent beneficiary farmers also expressed an increase in their income and fall in their cultivation cost and post harvest losses up to 20 per cent after the building up of infrastructure for horticultural crops. On the opposite, around 24 per cent households expressed no change in cost of cultivation and post harvest losses while only 12 per cent households indicated no change in their income after the intervention. Looking at the picture in different states, the more than 75 per cent households in Karnataka and Kerala indicated 10 to 20 per cent increase in productivity and decrease in production cost after intervention. In Chhattisgarh, all beneficiary households indicated 10 per cent increase in their productivity and decrease in their cost of production after intervention while 60 per cent of them indicated 10 per cent increase in their income and fall in post harvest losses. In Madhya Pradesh and Maharashtra, on the other hand, majority of the beneficiary households indicated no change in their productivity or household income after horticulture infrastructure intervention. Similarly, in Bihar all beneficiary households were of the view that there was no impact of intervention on their horticultural crop productivity or farmer' income and their cultivation cost of horticultural crops. In West Bengal all the beneficiary households indicated 10 per cent increase in their income. In Haryana where most of the intervention was providing plastic crates to the farmers for vegetable transportation, more than 80 per cent beneficiary farmers indicated fall in post harvest losses by 10 per cent. In Punjab and Uttar Pradesh, majority of the farmers indicated 10 per cent fall in cost of cultivation as a result of investment made by farmers in horticultural infrastructure.

### 3.3.3 Details of Interventions under Horticultural Crop Development

In the previous sections we discussed initiative taken under RKVY to facilitate the farmers for the development of horticulture sector. In addition to creation of horticulture infrastructure like green house, poly house, shade net, warehousing and storage facility at the farmers end, the state governments also provided subsidy to the farmers for the development of horticultural crops like planting material, seeds, fertilizer, plant protection material, micro nutrients, bio-fertilizers and area based incentives. Table 3.3c provides details of interventions carried out under horticulture crop development sector at the aggregate. Among the selected households, around 16 per cent availed benefits for horticulture crop development and as was mentioned in the crop development section subsidy for horticultural was also given for the components like seed, fertiliser, bio-fertiliser and micro nutrients to incentivise farmers for growing horticultural crops.

Among different components, the highest numbers of households (around 10 per cent) obtained subsidy for seeds and planting materials. The beneficiary households spent Rs 6661 on seeds and planting material for which they received subsidy amount of Rs 4625 that was around 70 per cent of the total cost incurred. On average, 930 kg of seed or planting material was supplied per beneficiary household and 1.1 acres per household area was covered by the subsidised seed and planting material. Fertiliser/plant protection materials and micronutrients were provided to around 4 and less than 1 per cent of the selected households, respectively while bio-fertilisers and other area based incentives were given to a few households that constituted only half a per cent of the selected households. The highest amount of subsidy was given for area based incentives, Rs 16 thousand per beneficiary household and area covered under the same was 1.5 acres per beneficiary household. For other components, viz., fertilizer subsidy per beneficiary household was Rs 3.5 thousand, for bio-fertilizer 2.4 thousand and for micro nutrient Rs 1.5 thousand. The quantity supplied per beneficiary household was 270 kg fertilizer, 57 kg micro

nutrient and 46 kg bio-fertilizer. About farmers' reaction to the impact of use of better quality seed, micro nutrients and bio and plant protection fertiliser, majority of the beneficiary households reported around 10 percent enhancement in their productivity and the same amount of reduction in production cost as a result of use of these inputs during the reference period.

Table 3.3c: Interventions made under horticulture crop development

| Sl. No. | Benefit code | % of Beneficiaries | Area in Acres (per hh) | Qty Supplied in kg per hh | Actual Cost Rs (per hh) | Subsidy as a % of cost | % increase in productivity | % decrease in cost |
|---|---|---|---|---|---|---|---|---|
| 1 | Seeds /Planting Materials | 10.3 | 1.1 | 931.1 | 6661 | 69.4 | < 10 % | < 10 % |
| 2 | Fertilizers and plant protection | 3.7 | 2.2 | 270.3 | 6324 | 55.5 | < 10 % | < 10 % |
| 3 | Micro Nutrients | 0.4 | 1.3 | 57.2 | 2099 | 70.8 | < 10 % | < 10 % |
| 4 | Bio-fertilizers and bio control agents | 0.5 | 2.1 | 45.6 | 2474 | 95.5 | < 10 % | < 10 % |
| 5 | Area based incentives | 0.2 | 1.5 | 0.4 | 15907 | 98.7 | < 10 % | < 10 % |
| 6 | Others | 0.7 | 1.5 | 193.8 | 25492 | 81.9 | < 10 % | < 10 % |
| 7 | Total | 15.8 | 1.4 | 680.4 | 7276 | 69.6 | < 10 % | < 10 % |

Further details of RKVY intervention about provision of horticulture crop developmental benefits to the selected households in the four regions are provided in Annex Table 3.3.3A. As against the aggregate average of 16 percent of the selected households participating in horticultural crop development activities, the proportion was highest in the case of north and south, where every 5$^{th}$ selected household obtained some subsidy while east region averaged 14 per cent that was close to the aggregate average while west and central region had the least intervention where around 9 per cent of the households obtained subsidy under the programme. Although intervention under horticulture crop development was highest in north and south, but the subsidy amount was lowest, Rs 1 thousand in north and Rs 6 thousand in the south. In the east and north-east region subsidy amount averaged at Rs 7 thousand and Rs 10 thousand in the west and central. Area under horticultural crops for which seed and other nutrients subsidy was provided on average was 1.8 acres in south, 1.6 acres in west and central, 1.4 acres in east and north-east and 1.2 acres in north region.

The highest intervention in the north was for seeds/planting material where 15 per cent of the selected households received subsidy and for fertiliser and plant protection 3 per cent of the households received subsidy. The subsidy amount for seed provision was only Rs 722 per beneficiary household and for fertilizer it was Rs 2770 per household. Jammu and Kashmir provided seed and planting material subsidy to around 62 per cent of the selected households with an average subsidy amount of Rs 550 only. Similarly, in Uttrakhand, 50 per cent of the selected households were given subsidy amount of Rs 227 per beneficiary household for seed and planting material for the horticultural crops. In Punjab, 16 per cent households were given fertilizer subsidy with average amount of Rs 3 thousand per beneficiary household. In the south region, 11 per cent selected households obtained fertilizer subsidy of Rs 4.7 thousand and 9 per cent obtained seed and planting material subsidy of Rs 7 thousand per beneficiary. In Kerala 21 per cent households obtained subsidy of Rs 2.5 thousand for fertilizer and 14 per cent obtained subsidy of Rs 2.7 thousand for seed and plating material. In Karnataka and Tamil Nadu, around 5 per cent households obtained seed and planting material subsidy of Rs 15 thousand and Rs 8 thousand, respectively. In Tamil Nadu, 7 per cent households also obtained Rs 9 thousand subsidy for fertilizer.

In the west and central region, Chhattisgarh provided around Rs 11 thousand amount of subsidy to 20 per cent of the selected households for seed and planting material. Similarly, in Gujarat, 10 per cent of the selected households were provided Rs 20 thousand per beneficiary subsidy for seed and planting material. In Madhya Pradesh, 4 per cent of the selected households obtained Rs 4.5 thousand subsidy for fertilizer and same percentage of households in Rajasthan obtained Rs 455 subsidy per beneficiary for seed and planting material while no intervention was done in Maharashtra for horticultural crop development. In the east and north-eastern region, intervention in horticulture crop development was mainly for distributing seeds and planting material whereby 10 per cent of the selected households obtained an average amount of Rs 4.7 thousand subsidy per beneficiary household. Looking at the distribution of seed and planting material subsidy among different states, in Arunachal Pradesh, 9 per cent of the selected households obtained Rs 2.2 thousand, in Assam around 10 per cent households obtained Rs 3 thousand, in Manipur 34 per cent households obtained Rs 3 thousand, in Meghalaya 7 per cent households obtained Rs 4.7 thousand, in Mizoram 16 per cent households obtained Rs 2.4 thousand, In Nagaland 11 per cent households obtained Rs 1.6 thousand, in Sikkim 11 per cent households obtained 13 thousand, in Tripura 15 per cent households obtained 8.5 thousand and in West Bengal 6 per cent households obtained Rs 9.6 thousand subsidy per beneficiary household.

Households in most of the states in the south region indicated less than 10 per cent increase in productivity as a result of supply of better seeds, fertiliser/bio-fertiliser, plant protection and micro nutrients. In the west and central region, selected farmers in Gujarat indicated 10-20 per cent increase in productivity and in Chhattisgarh and Madhya Pradesh indicated less than 10 per cent increase in yield rate as a result of better input usage while in Rajasthan and Maharashtra farmers indicated no change in the yield rate as no significant intervention was done in these two states. In the eastern and northern region farmers in Assam, Manipur, Mizoram and Sikkim indicated 10-20 or even 20-30 per cent increase in productivity while in other states where significant intervention was done indicated less than 10 per cent increase in crop productivity due to crop development intervention under RKVY programme. In most of the northern states, farmers indicated less than 10 per cent increase in productivity as a result of intervention in horticulture crop development. Similar were the reactions of the farmers towards fall in cost of production as a result of provision of subsidised seeds, fertilizer and micro nutrients to the farmers. Last but not the least, provision of inputs or subsidy under horticultural crops included number of horticultural crops, viz., oil palm, mango, gherkins, cashew nuts, banana, tapioca, coconut, anwla, kinnu, orange, mushroom, onion and other vegetables.

### 3.3.4 Impact of Horticulture Crop Development on Crop Productivity

Table 3.3d presents the frequency table on impact of horticulture crop development activities on crop productivity based on farmers' opinion. Around 33 percent farmers indicated 10 percent increase in their productivity with the use of subsidised seeds/planting materials, fertilizers, micronutrients and other area based incentives. Around 18 per cent opined that their productivity increased between 10 to 20 percent while around 12 percent indicated more than 20 percent increase in their productivity. On the opposite, around 16 percent households indicated that these interventions did not make any significant difference in their production or productivity level. Among the households who opined that there was no change in the productivity, the majority of

them obtained subsidy for seed and micro nutrients. Among different regions (Annex Table 3.3.4A), highest percentage of selected farmers (more than 48 per cent) in west and central region indicated less than 10 per cent increase in horticultural productivity as a result of crop development. Similarly, 39 per cent in north region, 30 per cent in south region and 20 per cent in east and north-east region indicated less than 10 per cent increase in productivity due to improved package of inputs. Those who indicated 10-20 per cent increase in productivity constituted 18 per cent of the selected households in north, 20 per cent in east, 17 per cent in west and south region. On the other hand, 11 per cent farmers in the south region, 22 per cent in the west and central, 9 per cent in the east and 22 per cent in the north propounded no change in their productivity after crop development intervention.

Table 3.3d: Overall impact of horticultural crop development intervention (All India)

| Sl. No. | Benefit code | % beneficiary reported increase in productivity | | | | | |
|---|---|---|---|---|---|---|---|
| | | No change | Less than 10 per cent | 10 to 20 per cent | 20 to 30 per cent | Above 30 per cent | Not responded |
| 1 | Seeds /Planting Materials | 19.7 | 32.9 | 19.8 | 9.5 | 4.9 | 13.2 |
| 2 | Fertilizers and plant protection | 8.6 | 34.6 | 14.3 | 3.7 | 2.7 | 36.2 |
| 3 | Micro Nutrients | 17.1 | 22.9 | 17.1 | 5.7 | 2.9 | 34.3 |
| 4 | Bio-fertilizers and bil control agents | 4.8 | 21.4 | 16.7 | 7.1 | 4.8 | 45.2 |
| 5 | Area based incentives | 0.0 | 40.0 | 13.3 | 20.0 | 0 | 26.7 |
| 6 | Others | 3.5 | 31.0 | 17.2 | 15.5 | 3.4 | 29.3 |
| Total | | 15.6 | 32.6 | 18.1 | 8.4 | 4.2 | 21.1 |

Thus, concluding the horticulture development through RKVY programme, it was observed that in most of the states, the lead that was taken for the development of horticulture sector though the programme of National Horticulture Mission as well as Horticulture Programme for the Himalayan states and the North-east was supported by RKVY. In many states, the subsidy programme for horticulture was provided only for the crop development while infrastructure building was done under the NHM programme. Nevertheless, the programme made its desired impact as in the opinion of the farmers there was enhancement in horticulture productivity albeit the increase remained mostly around 10 per cent that further need to be accelerated in the 12$^{th}$ Plan if horticulture is planned to provide lead in the growth of agriculture sector to achieve 4 per cent growth for the agriculture sector as a whole.

### 3.4 Micro and Minor Irrigation

Indian agriculture to a great extent still depends on monsoon which makes agricultural production uncertain and subject to large fluctuations. Irrigation problem is further exacerbated by the lack of efficient use of available rain water and lack of knowledge and resources for rain water harvesting. Potential irrigation in India is estimated at about 139.5 million hectares. Out of this, about 58.5 million hectares capacity is from major and medium irrigation sources, and 81.5 million hectare is from minor irrigation sources, that can further be classified into ground water 64.1 million hectares and surface water 17.4 million hectares (GoI, 2012-13). Out of the potential of around 140 million hectares only 110 million hectares of potential irrigated area has been created so far. But there has been huge gap between potential created and utilisation to the extent

of 15 per cent. The proportion of irrigated area was 47.18 per cent of the cultivated area in 2009-10 (GoI, 2012-13) and thereby a vast land is still under rain fed conditions.

As per our first report based on website data, the states which made use of substantial share of the total expenditure on micro/minor irrigation under RKVY Scheme during the 11$^{th}$ FYP were in the central and west region. Total expenditure on micro/minor irrigation stood at Rs. 4111 crore that turns out about 15 per cent of the gross total amount spent under RKVY during the 11$^{th}$ Plan period. In terms of numbers of projects, micro/minor irrigation under took 239 projects out of total 5749 projects in all the sectors constituting only 4.2 per cent in terms of numbers of projects. In other words, the amount spent per project in this sector was relatively higher compared to other sectors indicating possible investment by the farmers also larger in this sector compared to other sectors.

### 3.4.1 Intervention made under Micro and Minor Irrigation

Table 3.4a illustrates the details of interventions carried out for provision of better irrigation facilities to the farmers under RKVY programme among the selected households. The interventions were carried over by the Department of Agriculture, Irrigation, Horticulture, Watershed, Soil Conservation and some other departments including that of Civil Engineer and so on. Among our selected households, 14 per cent availed the benefit under the broad category of micro/minor irrigation. The benefits under micro/minor irrigation are classified as minor irrigation that includes digging of new wells (open/ bore wells), deepening of existing wells, energisation of wells (oil engine/electrical, pump set) and putting up underground plastic pipelines in the place of traditional open small canal system for water drainage from the pump set to the field. The micro irrigation includes installing drip/sprinkler system, lift irrigation system and laying of farm ponds for small scale irrigation. It is to be mentioned here that some of the micro/minor irrigation interventions have already been covered in the sectoral discussion under mechanisation where one of the activity was pump sets as well as in the horticulture infrastructure where some farmers obtained subsidy for laying drip and sprinkler irrigation along with green house/poly house/shade net or in the others horticultural activities category.

As secondary data showed higher volume of expenditure per project for micro/minor irrigation under RKVY, it was further verified by the primary survey data of selected households. On average, the beneficiary households of micro/minor irrigation made per household investment of Rs 86 thousand against horticulture infrastructure investment of Rs 73 thousand, mechanisation investment of Rs 85 thousand and crop development investment of Rs 2 thousand. The subsidy provision for micro/minor irrigation averaged at Rs 47 thousand per beneficiary household as against Rs 1.5 thousand in crop development, Rs 32 thousand in mechanisation and Rs 42 thousand in horticultural infrastructure. Subsidy as a percentage of investment was 54 per cent in micro/minor irrigation as against 77 per cent in crop development, 57.5 per cent in horticulture infrastructure and 38 per cent in mechanisation.

Looking at the components of micro/minor irrigation, households invested in pump sets, bore wells and farm ponds as well as some initiatives were taken for installing sprinkler and drip irrigation. On average households invested Rs 1.4 lakh for bore well for which Rs 1 lakh subsidy was given to 1.3 per cent selected households. Another 3 per cent households installed pump sets

for which an average subsidy amount of Rs 30 thousand per beneficiary household was given. The highest 4.3 per cent households invested in farm pond with an average amount of Rs 45 thousand and subsidy amount given for the same was Rs 22 thousand per beneficiary household. Drip irrigation was installed by 2.7 per cent selected households investing Rs 68 thousand per household for which Rs 31 thousand per beneficiary household subsidy was given. Sprinkler irrigation was laid by less than 1 per cent selected households for which average cost borne was Rs 68 thousand and the subsidy amount given for the same was Rs 38 thousand per beneficiary household. In addition to above items, around 2 per cent households were also given substantial amount of Rs 1.2 lakh subsidy for other activities like laying down the proper water pipeline to save and conserve water.

About the regional details of interventions under micro/minor irrigation (Annex Table 3.4.1A), as against the aggregate average of 14 per cent of the selected households participating in the irrigation projects, the proportion was highest 31 per cent in the case of west and central corroborating the trends seen in the secondary data. The west was followed by north around 13 per cent, south 8 per cent and east and north east around 7 per cent households participated in micro/minor irrigation. The subsidy amount given under the programme was highest in the north Rs 74 thousand per household, followed by west and central Rs 45 thousand, south Rs 36 thousand and east and north-east Rs 24 thousand while the overall amount of subsidy averaged at Rs 47 thousand per household. Subsidy as a percentage of investment was highest 73 percent in the east and north-east, 68 per cent in the south, 60 per cent in the north and lowest 47 per cent in the west and central. The average irrigated area per household was around 5 acres varying slightly across regions while impact of installing bore well, pump set and drip and sprinkler irrigation on enhancement in irrigated area by and large ranged between 5 to 20 per cent with lowest increase of around 5 per cent in the east and north-east and highest increase of 20 per cent in the south region as shown in Table 3.4a.

Table 3.4a: Interventions made under micro/minor irrigation

| SN | Details of intervention | % of beneficiaries | Irrigated area | | Avg cost in Rs. | Subsidy as a % of cost | Impact of intervention (%) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Acres | % increase | | | Increase in productivity | Decrease in cost | Increase in income |
| 1 | Drilling bore well | 1.4 | 5.3 | 9.4 | 144286 | 75.5 | 10 % to 20 % | < 10 % | 10 % to 20 % |
| 2 | Pump set | 3.4 | 5.2 | 4.6 | 77350 | 38.9 | < 10 % | < 10 % | 10 % to 20 % |
| 3 | Farm pond construction | 4.3 | 4.9 | 6.1 | 44904 | 50.0 | < 10 % | < 10 % | < 10 % |
| 4 | Sprinkler | 0.8 | 5.2 | 6.1 | 67761 | 56.3 | < 10 % | < 10 % | 10 % to 20 % |
| 5 | Drip Irrigation | 2.7 | 4.9 | 11.2 | 47732 | 64.5 | < 10 % | < 10 % | 10 % to 20 % |
| 6 | Others | 1.8 | 5.3 | 34.7 | 227167 | 52.4 | < 10 % | < 10 % | < 10 % |
| | Total | 14.3 | 5.1 | 10.6 | 86457 | 54.3 | < 10 % | < 10 % | 10 % to 20 % |

In the South region, Andhra Pradesh and Goa state did not make any intervention in micro and minor irrigation. In Karnataka 6 per cent selected households participated in micro/minor irrigation whereby interventions were mainly done in farm pond and pump sets and at the aggregate subsidy amount of Rs 11 thousand was given per beneficiary household. Similarly in Kerala, for drilling bore well, pump sets and farm pond subsidy amount of Rs 5 thousand per beneficiary household was given to 15 per cent of the selected households. In Tamil Nadu out of 17 per cent beneficiary households, 15 per cent of them obtained subsidy benefit of Rs 43 thousand per household for installing drip irrigation while the aggregate subsidy amount

averaged at Rs 40 thousand per beneficiary household. In Pondicherry Rs 1.5 lakh per household subsidy was given for installing drip irrigation to 11 per cent households.

In the west and central region, Chhattisgarh provided subsidy to the farmers for pump sets, farm ponds and drip irrigation. At the aggregate, 18 per cent farmers were given subsidy of Rs 17 thousand per beneficiary household. In Gujarat 2 per cent selected households were given Rs 26 thousand subsidy for installing drip irrigation and in Rajasthan 34 per cent households were given Rs 1.5 lakh per beneficiary household subsidy for farm pond and other irrigation related works. Madhya Pradesh emphasized irrigation priority under RKVY whereby every second household was given some subsidy under micro/minor irrigation as 58 per cent selected households obtained subsidy under this sector. Above 23 per cent households obtained Rs 11 thousand per household subsidy for farm pond, 19 per cent obtained Rs 23 thousand subsidy for pump sets and another 10 per cent obtained Rs 9 thousand per household subsidy for putting up drip irrigation. At the aggregate, 58 per cent selected households obtained Rs 17.5 thousand subsidy per beneficiary household for irrigation purpose in the state. Highest investment in drip and sprinkler irrigation was done by Maharashtra where around 30 per cent selected households installed sprinkler or drip irrigation for which subsidy amount of 15 and 19 thousand, respectively per beneficiary household was given for the purpose. At the aggregate, 31 per cent households in the west and central region were given subsidy amounting to Rs 45 thousand per household for irrigation whereby intervention was done mostly in all activities, viz., pump set (6 per cent), farm pond (9 per cent), sprinkler (3 per cent) and drip irrigation (7 per cent) household carried out irrigation installation work.

Most of the states in the east and north-east region had relatively less intervention in micro and minor irrigation sector as only 7 per cent households at the aggregate were found having invested in micro/minor irrigation. Highest intervention was done in farm pond in which 13 per cent households in Orissa, 10 per cent in Bihar, 8 per cent in Jharkhand, and less than 5 per cent in Mizoram and West Bengal participated. The subsidy given varied from Rs 49 thousand in Mizoram to Rs 18 thousand in Assam, Rs 11.5 thousand in West Bengal and Rs 8 to 9 thousand in Orissa, Jharkhand and Bihar, each. In Assam 9 per cent households were given Rs 7 thousand subsidy per households for pump set. In Bihar 5 per cent selected households were given Rs 34 thousand per household subsidy for installing drip irrigation. In Meghalaya 3 per cent of selected households were given per household subsidy amount of Rs 20 thousand for pump set. In Mizoram Rs 81 thousand of subsidy per household was given to around 2 per cent selected households for drip irrigation. In Tripura Rs 64 thousand of subsidy was given for pump set and Rs 12 thousand was given for drip irrigation to one per cent of the selected households. At the aggregate, average subsidy amount per beneficiary household in east and north-east region was Rs 24 thousand and only 202 households received the subsidy for all items of micro and minor irrigation.

In the north region, the major intervention in micro/minor irrigation was for digging bore well and installing pump sets where around 5 per cent of the selected households received subsidy amount of Rs 1.1 lakh and Rs 50 thousand, respectively for the above mentioned two activities. Among different states, Haryana carried out laying up plastic pipeline for water disposal for which Rs 33 thousand per household subsidy was given to around 2 per cent selected households. In Himachal Prasdesh 6 per cent households were given Rs 44 thousand per

household for installing pump sets and 7 per cent households were given Rs 6 thousand subsidy for the construction of farm pond. In Jammu and Kashmir 14 per cent of the selected households were given around Rs 1 lakh per household subsidy for installing pump set. Another 6 per cent were given Rs 11 thousand per household for the farm pond. Uttar Pradesh provided Rs 1.1 lakh subsidy to 13 per cent selected households for drilling bore well and another 7 per cent households obtained Ra 18 thousand per household subsidy for the installation of pump sets.

### 3.4.2 Impact of Micro/minor Irrigation on Crop Productivity and Farmer's Income

Investment in irrigation in terms of installing pump set, bore well, drip and sprinkler irrigation provides multiple advantage to the farmers in terms of increased productivity with more irrigated area as well improving the quality of the output produced as well raising their crop intensity as with irrigated area farmers grow two or more crops in a year compared to one crop mostly grown on rainfed area. Thus, farmers not only have better productivity but their farm business income also increases due to double cropping. Investment in drip and sprinkler irrigation also known as protected or precision farming not only increases crop productivity but also saves water, reduces irrigation charges like diesel or electricity consumption for pumping out ground water and reduces cost of cultivation.

In our course of field work, we enquired the farmers how investment in micro/minor irrigation has helped the farmers, their responses are summarised in Table 3.4a and 3.4b and regional details are given in Annex Table 3.4.1A. A majority of the households who obtained subsidy for pump set, farm pond and drip and sprinkler irrigation indicated 10 per cent increase in their productivity after the intervention. As was mentioned above, farmers gain not only in terms of higher revenue from increased productivity but they also gain from increase in cropping intensity and decrease in their cost of production. As a consequence net farmers' gain in terms of additional income was found more as farmers indicated around 20 per cent increase in their farm business income due to intervention especially in drilling bore well, pump set and drip and sprinkler irrigation. The frequency table below shows that around half of the beneficiary farmers indicated 10 per cent increase in their productivity with additional 30 per cent indicating up to 20 per cent increase in productivity. At the aggregate around 85 per cent households benefitting from irrigation intervention were of the view that their productivity increased from less than 10 per cent to up to 30 per cent which is self explanatory in terms of gains of irrigation intervention in raising agricultural production and achieving 4 per cent growth rate for this sector. The positive impact of irrigation intervention is further enunciated by the fact that only 3 per cent of the beneficiary households indicated no change in their productivity after intervention in irrigation whereas in the case of interventions in other sectors, the percentage of households indicating no change in productivity was much higher. Across various regions, in the north majority of households indicated increase in productivity up to 20 per cent, in east and north-east it was less than 10 per cent as the volume of intervention in that region was also less. In the west and central region where highest intervention was done in micro/minor irrigation, majority of farmers indicated up to 20 per cent increase in their productivity while in the south region majority indicated up to 10 per cent increase whereas the households who invested in drip irrigation indicated 20 per cent increase in their productivity. Whereas on the one hand, intervention led to higher productivity thorough higher irrigated area it also led to decrease in cost of production and increase in farmers' income. It is evident from the table that farmers in

most of the cases had one to one relation with increase in their productivity and decrease in cost of production vis-a-vis increase in their farm business income at all India as well as among different regions (Table 3.4b and Annex Table 3.4.1A). The major focus of introducing irrigation (micro/minor) in agriculture is to improve productivity, save water, reduce losses and increase farmers' profitability and the objective seems to be fulfilled to some extent.

Table 3.4b: Overall impact of micro/minor irrigation

| Sl. No | Total Impact of intervention | % beneficiaries reported | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | No change | Less than 10 per cent | 10 to 20 per cent | 20 to 30 per cent | Above 30 per cent | No response | Total |
| 1 | Increase in Productivity | 3.0 | 46.2 | 29.3 | 8.2 | 8.3 | 5.2 | 100.0 |
| 2 | Decrease in cost | 16.5 | 59.5 | 11.2 | 3.5 | 3.9 | 5.5 | 100.0 |
| 3 | Increase in income | 3.5 | 31.2 | 40.2 | 11.2 | 7.1 | 6.9 | 100.0 |
| 4 | Increase in irrigated area | 4.3 | 77.9 | 2.4 | 4.4 | 11.1 | 0.0 | 100.0 |

Before moving to the next section, it is briefly mentioned here that the intervention in micro irrigation like drip and sprinkler led to some tangible benefits to the households as well as to the farming sector as a whole like saving water, fertiliser and manpower (Table 3.4.c). These are advantages not only for the household but also are helpful preserving scare resources like water and are eco friendly and shall be helpful in meeting with the spectre of climate change. Last but not the least, interventions in some of these activities like crop development, horticulture infrastructure and micro/minor irrigation helped farmers changing their cropping pattern moving towards more beneficial crops. Table 3.4d presents the percentage of beneficiary households under different programmes who as a result of intervention shifted their cropping pattern mostly from foodgrain crops towards more commercial crops. It is observed from the statistics in table that due to crop development around 8 per cent households observed a shift in their cropping pattern. Similarly, due to horticulture infrastructure intervention around 14 per cent households and due to micro and minor irrigation intervention around 10 per cent households shifted their cropping pattern. In all the cases where households shifted their cropping patter observed around 20 to 30 per cent increase in their farm business income.

Table 3.4c: The percentage of beneficiaries having tangible benefits of drip and sprinkler irrigation

| Region | Water saving | | Fertiliser saving | | Manpower saving | |
|---|---|---|---|---|---|---|
| | % beneficiaries observed water saving out of total drip/sprinkler irrigation beneficiaries | % quantity of water saved | % beneficiaries observed fertiliser saving out of total drip/sprinkler irrigation beneficiaries | % quantity of fertiliser saved | % beneficiaries observed labour work saving out of total drip/sprinkler irrigation beneficiaries | % labour mandays saved |
| South Region | 48.4 | 46.8 | 51.6 | 36.5 | 56.3 | 29.2 |
| West and Central Region | 4.2 | 38.1 | 4.2 | 38.3 | 4.2 | 33.8 |
| East and North-east Region | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| North Region | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total | 13.9 | 44.4 | 14.3 | 36.9 | 15.3 | 30.0 |

Table 3.4d: Change in cropping pattern as a result of intervention under RKVY programmes

| Region | Crop development | | Horticulture infrastructure development | | Micro/minor irrigation | |
|---|---|---|---|---|---|---|
| | % beneficiaries observed cropping pattern change | % increase in income | % beneficiaries observed cropping pattern change | % increase in income | % beneficiaries observed cropping pattern change | % increase in income |
| South Region | 11.0 | 25.3 | 25.2 | 35.3 | 18.3 | 33.2 |
| West and Central Region | 12.0 | 22.7 | 17.5 | 22.0 | 5.0 | 32.1 |
| East and North-east Region | 3.4 | 23.7 | 7.7 | 19.8 | 5.0 | 30.0 |
| North Region | 21.9 | 24.2 | 13.5 | 21.8 | 24.2 | 32.7 |
| Total | 8.4 | 23.8 | 14.0 | 26.1 | 10.7 | 32.4 |

## 3.5 Animal Husbandry and Dairy

A large number of farmers in India depend on animal husbandry and dairying for their livelihood. The sector plays a crucial role in supplementing family incomes and generating employment in rural areas. This is especially beneficial for landless labourers, small and marginal farmers and women. In addition, it is also considered as a source of nutrition. India's animal husbandry sector is one of the largest in the world. It has 56.7 per cent of world's buffaloes, 12.5 per cent cattle, 20.4 per cent small ruminants, 2.4 per cent camel, 1.4 per cent equine, 1.5 per cent pigs and 3.1 per cent poultry. In 2010-11, the sector generated output which comprised 4 per cent of the gross GDP and 26 per cent of the agricultural GDP. The sector is expected to emerge as an engine of agricultural growth in the 12th Plan and beyond in view of rapid growth in demand for animal food products. Achieving growth rate of 5-6 per cent, however, would require addressing challenges of shortage of feed and fodder and frequent occurrence of some deadly diseases. The sector has remained under-investment and neglected by the financial and extension institutions. Livestock market is under-developed, which is a significant barrier to the commercialization of livestock production. Besides, the sector will also come under significant pressure of increasing globalization of agri-food markets (Planning Commission, 2012). According to the Department of Animal Husbandry, Dairying and Fisheries, Government of India, India has the world's largest dairy herd (composed of cows and buffaloes), at over 304 million and stands first in milk production, with 132.4 million tonnes of milk produced in 2012-13. India is also the third largest egg-producer in the world, at over 191 million eggs being produced every day or 69.7 billion eggs for the year 2012-13 and the world's sixth largest producer of meat with 5.9 million tonnes of production of meat in India during 2012-13.

As per RKVY website (our first report) data, animal husbandry was one of the prominent sectors under the RKVY Programme, with a share of 11 per cent in the total expenditure and 18.5 per cent in the total number of projects undertaken during the 11$^{th}$ FYP. In absolute terms, the total expenditure on animal husbandry was Rs 3066 crore across 1064 projects in the country as a whole. Across the regions, the west and central region spent the maximum with 37.5 per cent share of all-India expenditure while north region spent the lowest amount with a share of 17.4 per cent of total expenditure in the country.

### 3.5.1 Intervention made under Animal Husbandry and Dairy

Under animal husbandry sector there were multiple interventions, e.g., the households were provided subsidy for buying local or hybrid variety of milch and other animals like cow, buffalo, sheep, goat, pig and other poultry animals. A large amount of subsidy was provided to the farmers for establishing modern scientific cattle shed and all animals bought under subsidy scheme were insured for life and there was also subsidy provision for the insurance premium as well as insurance chip. Subsidy was also given for fodder chopper and milking instruments. Many other items were also covered under subsidy scheme like *gobar* gas plant and organic manure unit, subsidy for water tank, for feed and fodder, for water fogger and so on. Most of the interventions were made by either Department of Veterinary and Animal Husbandry or Dairy Department. Chapter 2 presented details about animal ownership among the sample households where we found on average more than 50 per cent households owned cows and there were around 1.5 cows per households while around 30 per cent households owned a buffaloes whose average number per household was less than one. Average per household value of animals owned by the selected households was Rs 76 thousand. Thus, among our sample households animal husbandry was one of the main activities and that provided a major source of supplementary income to the selected households as was also evident from the sources of household income discussed in the previous chapter.

The RKVY programme targeted to modernise animal husbandry by complementing farmers with financial help to buy better yielding breed of animals, adopting better varieties of feed and fodder and establishing scientific cattle shed that can improve their milk and meat quantity and quality. It is evident from Table 3.5a that around 17 per cent selected households at the aggregate availed subsidy benefits under animal husbandry in comparison to 35 per cent in crop development, 21 per cent in mechanisation, 14 per cent in micro/minor irrigation and 9 per cent in horticultural infrastructure. As mentioned above the main emphasis of animal husbandry programme was to increase the yield of milk by incentivizing farmers to buy better breed of the milch animals. Around 3 per cent households invested in buying cows and another 3 per cent buffaloes, 2 per cent bought sheep and goat and another 1 per cent invested in poultry and piggery. Among all the households who bought animals under this programme also obtained subsidy for the insurance premium. Around 2 per cent households invested in modern cattle shed while few households bought milking instruments, fogger, fodder chopper and some other implements for animal husbandry. The aggregate per household investment in animal husbandry stood at Rs 64 thousand and beneficiary households received subsidy amount of Rs 26 thousand that was around 40 per cent of the total investment. The subsidy amount for other sectors averaged at above Rs 40 thousand for micro/minor irrigation and horticulture infrastructure while it was Rs 32 thousand for mechanisation.

The numbers of animals for which subsidy was provided averaged at 3 cows, less than 2 buffaloes, 11 sheep and goat, 6 pigs, around 183 poultry chicks while insurance subsidy was given for four animals per beneficiary household. Per household investment was Rs 1 lakh on cows, around 50 thousand on buffaloes, around Rs 30 thousand on sheep and goat, Rs 24 thousand on pigs and Rs 9 thousand on poultry. Further, beneficiary households invested Rs 2.4 lakh on cattle shed, Rs 72 thousand on milking instruments, Rs 32 thousand on foggers, Rs 18 thousand on fodder chopper and Rs 12 thousand on insurance per household. The subsidy share in the above investment was Rs 38 thousand per beneficiary household for cows, Rs 16 thousand for buffaloes, sheep/goat and pigs each, Rs 69 thousand for cattle shed, Rs 39 thousand for

milking instruments, Rs 29 thousand for water foggers, Rs 12 thousand for fodder chopper and Rs 6 thousand for insurance premium.

Table 3.5a: Interventions made under animal husbandry and dairy

| S. N. | Animal / Item | % of beneficiaries availed | Average No. per beneficiary HH | Average cost per HH (Rs.) | Average subsidy per HH (Rs.) | Subsidy as a percent of cost | % Increase in productivity (Modal Value) | % Fall in labour cost (Modal value) | % Better cattle health (modal value) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Cows | 3.0 | 3.2 | 100901 | 37780 | 37.4 | 10 % to 20 % | 10 % to 20 % | NA |
| 2 | Buffaloes | 3.0 | 1.6 | 47082 | 16217 | 34.4 | 10 % to 20 % | No change | NA |
| 3 | Sheep / Goat and other animals | 1.7 | 10.8 | 30947 | 16096 | 52.0 | < 10 % | < 10 % | NA |
| 4 | Pig | 0.8 | 6.2 | 24136 | 17047 | 70.6 | 10 % to 20 % | < 10 % | NA |
| 5 | Poultry | 1.0 | 183.0 | 9351 | 6453 | 69.0 | No change | 20 % to 30 % | NA |
| 6 | Insurance of Cattle (number of cattle) | 1.8 | 4.4 | 11997 | 5920 | 49.4 | NA | NA | NA |
| 7 | Cattle shed | 1.7 | - | 237540 | 69313 | 29.2 | No change | < 10 % | < 10 % |
| 8 | Fodder Chopper | 0.5 | - | 17889 | 11680 | 65.3 | < 10 % | < 10 % | < 10 % |
| 9 | Milking instruments | 0.2 | - | 71733 | 39354 | 54.9 | 10 % to 20 % | No change | < 10 % |
| 10 | Foggers | 0.3 | - | 32249 | 29374 | 91.1 | No change | No change | No change |
| 11 | Others | 3.2 | - | 34919 | 25373 | 72.7 | < 10 % | No change | No change |
|  | TOTAL | 17.0 | - | 64246 | 25763 | 40.1 | 10 % to 20 % | < 10 % | < 10 % |

Among different regions, the highest percentage of households participated in animal husbandry in south India 25 per cent followed by north India 21 per cent, east and north-east 14.5 per cent and west and central region had the lowest participation of only 10 per cent (Annex Table 3.5.1A). The aggregate subsidy amount per beneficiary household was Rs 11 thousand in south, Rs 17 thousand in the west and central, Rs 30 thousand in the east and north-east and Rs 38 thousand in the north. Glancing through different states, in Haryana, 3 per cent selected households obtained subsidy amounting to Rs 1.6 lakh per beneficiary household for cows, 4 per cent households obtained subsidy of Rs 1.5 per beneficiary household for establishing cattle shed and another 6 per cent obtained Rs 7.5 thousand per beneficiary household for foggers. At the aggregate, around 15 per cent selected households in Haryana obtained Rs 83 thousand subsidy per beneficiary household for animal husbandry. Similar to Haryana, in Punjab also around 23 per cent selected households were given Rs 1 lakh per household subsidy for establishing modern cattle shed. In addition, 7 per cent households obtained Rs 32 thousand per household for insurance, 4 per cent were given Rs 12 thousand per household subsidy for fodder chopper, 1 per cent were given Rs 2.3 lakh per household for buying highbred cows and around 1.5 per cent given Rs 89 thousand per household subsidy for milking instruments. The average subsidy in Punjab was Rs 44 thousand per household obtained by 11.6 per cent of the selected households. In Uttar Pradesh 13.5 per cent selected households obtained Rs 11 thousand per household subsidy for buffaloes while at the aggregate, Rs 12 thousand subsidy was given to 18 per cent of the selected households. In Uttrakhand 17 per cent selected households obtained Rs 21 thousand per household for buying cows, 5 per cent obtained Rs 12 thousand per household for buying buffaloes and 6 per cent obtained 26 thousand per household for sheep and goat. At the aggregate, the state gave Rs 18.6 thousand per household subsidy to 36 per cent selected households for animal husbandry. Compared to these four states, the remaining states in the north had marginal intervention in animal husbandry whereby in Jammu and Kashmir, only 6 per

cent households were given Rs 4 thousand per household and in Himachal Pradesh 4 per cent households were given Rs 7 thousand per household subsidy for animal husbandry.

In the east and north-eastern region, the highest intervention under animal husbandry was done in Jharkhand where around 70 per cent selected households obtained Rs 26 thousand per household subsidy mainly for buying animals. Around 18 per cent households were given Rs 70 thousand per household for cows, 13 per cent were given Rs 19 thousand per household for buffaloes, 6 per cent were given Rs 15 thousand per household for poultry and another 2 per cent were given less than Rs 10 thousand per household for goat, sheep and pigs. In Tripura 24 per cent selected households obtained Rs 34 thousand per beneficiary household mainly for the construction of cattle shed and buying pigs and sheep/goat. In Mizoram 23 per cent selected households obtained Rs 73 thousand per household mainly for activities like installing plastic water tank, feeding tray, cattle shed and for buying poultry. In Arunachal Pradesh, 21 per cent household obtained per household subsidy of Rs 19 thousand mainly for buying cows, pigs and installing cattle shed. In West Bengal 19 per cent selected households obtained Rs 5 thousand each for buying cows and for poultry and the animal insurance.

In the south region, highest 66 per cent selected households in Puducherry obtained Rs 20 thousand per household subsidy for buying cows and for the establishment of cattle shed. In Andhra Pradesh 64 per cent selected beneficiaries obtained Rs 9 thousand per household subsidy under animal husbandry out of which 25 per cent obtained Rs 16 thousand per household for buying buffaloes. Another 6 per cent obtained Rs 15 thousand per household subsidy for buying cows while 31 per cent obtained less than Rs 2 thousand per household subsidy for animal insurance. In Tamil Nadu 20 per cent households obtained Rs 10 thousand per beneficiary mainly for buying animals while in Kerala around 19 per cent selected households obtained Rs 8 thousand per beneficiary for buying cows. In Andaman and Nicobar Island around 14 per cent selected households received less than 2 thousand per household subsidy for piggery. In other states, viz., Karnataka and Goa only 5 and 2 per cent households, respectively received some subsidy for animal husbandry.

In the west and central region, Maharashtra had the highest participation of farmers in animal husbandry where 23 per cent selected households obtained Rs 19 thousand per household subsidy. The highest 10 per cent farmers obtained Rs 10 thousand per household subsidy for buying sheep and goat, 4 per cent obtained around Rs 27 thousand per beneficiary for buying cows and buffaloes, each. In Chhattisgarh at the aggregate, 12 per cent households obtained Rs 12 thousand per household whereby 8 per cent households obtained Rs 16 thousand for fodder chopper and 4 per cent households obtained Rs 3 thousand per household for buying sheep and goat. In Rajasthan 9 per cent households obtained less than Rs 1 thousand per household subsidy for animal insurance while in Madhya Pradesh 6 per cent household obtained Rs 15 thousand per household mainly for buying sheep and goat and in Gujarat only 3 per cent selected households obtained Rs 55 thousand per household subsidy for buying cows, poultry and for establishing cattle shed.

Annex Table 3.5.1A also provides numbers of animals in which households made investment in different regions. On average households in the west invested in 5 cows per household, in the east and north around 4 cows per household and in the south between 1-2 cows per household. In

the case of buffalo mostly whole of south, east and west households invested in one buffalo per household while in the north average was two buffaloes. The numbers of sheep/goat averaged at 13 in north, 9 in the east, 11 in the west and south each. In the case of piggery, the average numbers of pigs in the south was 3 pigs, 8 pigs in the east, 5 pigs in the north while no investment was done on pigs in the west and central region. The variation in chicks was much higher among different regions while it was more than 180 in the north but only 35 in the west and central. The highest numbers of cows and buffaloes covered under subsidy scheme occurred in Punjab where around 18 cows and 20 buffaloes per beneficiary household were provided subsidy. Similarly, in Gujarat 20 cows per beneficiary households and in Haryana 11 cows and 10 buffaloes per beneficiary household obtained subsidy.

### 3.5.2 Impact of Animal Husbandry and Dairy on Household Income

As seen in Tables 3.5a majority of the cow and buffalo beneficiaries and those who invested in milking instruments reported an increase in their milk productivity up to 20 per cent as a result of intervention. Similarly, sheep/goat intervention led to 10 per cent hike in meat production for the beneficiaries. However, cattle shed did not lead to higher productivity in milk as was indicated by the modal value but it led to around 10 per cent fall in labour cost as well as it improved animal health given the better feeding and waste drainage facility in the modern cattle shed being promoted under the RKVY programme. Similarly, additional animals bought under the programme led to economies of scale thereby cutting labour cost per head for the beneficiary households. The labour cost reduced up to 10 per cent as a result of intervention under animal husbandry. The intervention in cattle shed, milking instruments, fodder chopper and foggers improved animal health that ultimately leads to longer life for the animal, more productive period, better productivity in milk and outcome of all this is increased household profitability from animal husbandry. The results for most of the regions were similar to the aggregate (Annex Table 3.5.1A). In the north, households observed around 10 per cent increase in their milk productivity and the same amount of fall in cost and better animal health as a result of intervention under RKVY. In the other three regions farmers expressed the similar views except in the south and eastern region household observed tremendous improvement in animal health as a result of investment in cattle shed and milking instruments.

Table 3.5b presents frequency table about impact of intervention on the household income among the beneficiary households. Out of around 17 per cent selected households who participated in animal husbandry, around 9 per cent reported having milk production during the reference year. Around 36 per cent of such households indicated around 20 per cent increase in their household income after intervention. Another 29 per cent indicated around 10 per cent increase in their income as a result of intervention while 23 per cent indicated more than 20 per cent increase in household income due to higher milk production. Among the households who produced milk less than 1 per cent indulged in selling milk products. Among those who sold milk products, above 40 per cent of them indicated up to 20 per cent increase in their household income as a result of intervention under RKVY. There was also additional household income due to production and sale of manure prepared from animal waste and by selling off animals. Few households who reared sheep/goat and poultry (less than 1 per cent) indicated 10 to 20 per cent increase in their income after RKVY intervention by selling of additional meat and poultry products. On the opposite, around 15 per cent beneficiary households indicated that intervention did not make any difference in their household income. Similar results are reported for different

regions in Annex Table 3.5.2A. The households who reported no change in household income after the intervention averaged at 9 per cent in south, 12.5 per cent in west and central, 18 per cent in the east and north-east and 22 per cent in the north.

Table 3.5b: Impact of animal husbandry components on household income

| Sl. No. | Particulars of items | % of beneficiaries | % beneficiary reported increase in income | | | | |
|---|---|---|---|---|---|---|---|
| | | | No change | < 10 per cent | 10 to 20 per cent | 20 to 30 per cent | Above 30 per cent |
| 1 | Milk | 9.2 | 9.5 | 28.6 | 35.7 | 12.3 | 11.1 |
| 2 | Milk Products | 0.6 | 23.5 | 31.4 | 19.6 | 2.0 | 3.9 |
| 3 | Meat | 0.8 | 10.1 | 33.3 | 13.0 | 18.8 | 13.1 |
| 4 | Eggs | 0.4 | 29.4 | 29.4 | 23.5 | 14.7 | 2.9 |
| 5 | Skin /Hide Etc. | 0.1 | 0.0 | 0.0 | 100.0 | 0.0 | 0.0 |
| 6 | Manure | 8.7 | 23.5 | 59.4 | 12.9 | 2.6 | 1.0 |
| 7 | Animal sale | 2.3 | 8.1 | 32.8 | 36.6 | 11.8 | 8.7 |
| 8 | Others | 0.3 | 14.3 | 28.6 | 21.4 | 3.6 | 28.6 |
| | TOTAL | 17.0 | 15.6 | 41.2 | 25.2 | 8.3 | 6.9 |

### 3.5.3 Details of Feed Supplements Availed under Animal Husbandry and Dairy

In addition to subsidy provided to the households discussed above, some additional subsidy or feed supplements given to the households who invested in animal husbandry and dairy. Table 3.5c provides details of subsidy given for feed and other supplements. Subsidy was given mainly for calcium, protein, vaccine and de-worming tablets and for fodder seed and fodder root cuttings. In the case of vaccine and de-worming tables, the subsidy was 100 per cent, i.e., the animals were treated free of cost or given material fully subsidised. Some of the states organised fair or *melas* where households brought their animals for treatment on a particular day in a week or in a month.

Table 3.5c: Details of feed supplement availed by the beneficiaries under animal husbandry

| Sl. No. | Name of Item | No. of Beneficiaries | Qty Per HH in Kg. | Total Cost Per HH in Rs | Subsidy Per HH in Rs | % subsidy to total cost in Rs |
|---|---|---|---|---|---|---|
| 1 | Calcium | 1.1 | 145.4 | 1096 | 943 | 86 |
| 2 | Protein | 1.9 | 187.1 | 2737 | 1987 | 73 |
| 3 | Jaggery | 0.0 | 50.5 | 818 | 818 | 100 |
| 4 | Azolla | 0.2 | 80.1 | 8166 | 5490 | 67 |
| 5 | Fodder seed | 0.6 | 48.1 | 5896 | 3331 | 56 |
| 6 | Fodder root cuttings | 0.02 | 35.0 | 13500 | 7000 | 52 |
| 7 | Vaccine | 1.5 | 0.6 | 192 | 182 | 95 |
| 8 | De-worming tablets | 0.9 | 22.2 | 337 | 337 | 100 |
| 9 | Others | 1.2 | 53.8 | 6014 | 5840 | 97 |
| | TOTAL | 7.5 | 86.2 | 2690 | 2134 | 79 |

On aggregate, 7.5 per cent households at the aggregate obtained help under feed supplement. The highest amount of subsidy was given for fodder root cuttings and for azolla around Rs 7 and 5.5 thousand per beneficiary household, respectively. In other cases, subsidy amount varied from less than Rs 200 to above Rs 3 thousand. At the aggregate, subsidy amount of Rs 2 thousand was provided per beneficiary household. The corresponding details for different regions are given in Annex Table 3.5.3A. The participation of households was 22 per cent in the south, 6 per cent in

the west and central, 4 per cent in the north and only 1 per cent in the east and north-east. The average subsidy amount per beneficiary households in the south was Rs 1.4 thousand, in the west, Rs 3.6 thousand, in the east Rs 3.2 thousand and in the north Rs 2.2 thousand. The point to be highlighted here is that although the amount of subsidy given was nominal but it spread awareness among the households for timely vet nary treatment that ultimately improves animal life span and increases their milk as well as meat productivity.

# Chapter 4

## Analysis of Minor Sectors

The RKVY programme classified agriculture and allied activities into 20 sectors. Out of the total RKVY expenditure of Rs 27414.10 crores during the 11th Five Year Plan, more than 66 per cent was absorbed by 7 sectors that we have categorized as the major sectors and discussed in details in the previous chapter. The remaining 34 per cent of the total expenditure was spent on 13 sectors that we have categorized as minor sectors and shall be the main subject matter of this chapter. Within the minor sectors, natural resource management (NRM) topped the list with 5.1 per cent of the total expenditure, followed by marketing and post harvest management with 4.9 per cent of the total expenditure. The expenditure on other six sectors followed in the descending order of dairy development 3.8 per cent, fisheries 3.6 per cent, research 2.8 per cent, integrated nutrient management (INM) 2.6 per cent, organic farming 2.5 per cent and cooperatives 1.6 per cent of the total expenditure. Each of the remaining 3 sectors namely non-farm activities, sericulture and innovative programs had incurred less than one per cent of the total cumulative expenditure under RKVY programme (see Table 1.1 in Chapter 1).

In this chapter, findings of five minor sectors viz., NRM, IPM, organic farming, sericulture and cooperatives/cooperation are discussed across regions and states based on our primary survey data. From the percentage allocation of total amount among the minor sectors during the 11th Plan it is clearly understood from the expenditure pattern that sustainable issues of agriculture were not adequately represented in the RKVY programme.

### 4.1 Natural Resource Management (NRM)

Over dependence on agriculture and commercialization of agriculture leads to land degradation, loss of biodiversity, poor productivity and over utilization of natural resources. Climate change has further aggravated the situation with low and erratic rainfall. All these problems can be reduced to some extent by protecting and managing the natural resources. Management of natural resources specifically land and water is crucial for sustainable development of agriculture sector. Given the importance of the natural resources management, The union agriculture ministry has created NRM sector by allocating Rs. 1400 crore to this sector during the 11th Five Year Plan. During our field survey, detailed information was collected on the following aspects: extent of acreage and crops covered, types of interventions undertaken, methods adopted for soil treatment and so on. Watershed development and soil testing are two sub-components within the NRM sector.

### 4.1.1 Watershed Development.

Watershed is an area from which runoff from precipitation flows to a common point to join a lake, river or ocean (Kolavalli and Kerr, 2002; Subha, 2002). Here running water is made to walk, walking water to crawl and crawling water is made to infiltrate through soil and water conservation measures. Watershed Development Programmes have been initiated in India to improve and sustain productivity and the production potential of the dry and semi arid regions of the country through the adoption of appropriate production and conservation techniques. It is a holistic approach to improve and develop the economic and natural

resource base of dry and semiarid regions. The programmes have primarily stressed upon improvement of wasteland, runoff reduction, water conservation and protective irrigation mechanism in all areas including desert prone areas and drought prone areas. Watershed programme is in fact a dynamic strategy for minimizing risks in rainfed agriculture through increasing production and stabilizing income of farmers. Among all the selected beneficiaries only around 5 per cent of them made intervention under watershed development programme and that is also the reason why this particular sector is counted as a minor sector intervention. The beneficiaries of RKVY programme undertook about 15 types of watershed interventions (Table 4.1a). Among different types of interventions made under watershed, construction of farm ponds/dug wells (1.4 per cent of beneficiaries) and diggies (1.1 per cent beneficiaries) were the two major interventions undertaken by our selected households as revealed by the statics presented in the table. These two activities were followed by lining of tanks or ponds, pre casted pipe distribution system, renovation of tanks and land leveling in which a few beneficiaries (above 0.2 per cent) made investment while other activities were almost negligible.

Although intervention under watershed development was only among few selected households as is the case with all the minor activities discussed in this chapter, however, the volume of intervention under watershed was quite high as any activity under watershed requires some fixed capital investment. It is seen from table that the intervention cost per household on watershed development at the aggregate was around Rs 1.5 lakh per beneficiary household and the cost variation was as high as Rs 3.7 lakh in the case of diggies, Rs 2.6 lakh for community tanks, Rs 2 lakh for check dam, Rs 1.4 lakh for desilting of ponds/tanks, Rs 1.1 lakh for lining tanks/ponds and Rs 1 lakh for percolation tanks and so on. The subsidy amount under watershed development varied from Rs 2.5 lakh for community tanks around Rs 2 lakh for check dam and doggies and around Rs 45 thousand for dug well and farm pond. At the aggregate, subsidy for watershed development averaged at Rs 90 thousand per household. It is pertinent to note that although we collected information about watershed development based on household information, however, most of the activities under watershed development were based on community activities and thereby subsidy provision was also community based and not purely household based. Overall watershed development activities taken up at small scale led to some marginal increase in crop area and crop productivity as the same has been summarized in the table.

Looking into different regions, Annex Table 4.1A indicates that west and central region had implemented watershed development interventions more than any other region. This is clearly reflected by the larger share of about 62 per cent of the total sample beneficiaries of watershed development programme belonging to this region. In the west and central region around 13 per cent of the total beneficiaries of that region made intervention under watershed development. The total investment on watershed per household in the west and central region was around Rs 1.9 lakh and the subsidy amount on average was Rs 1.1 lakh per beneficiary households. In the southern region less than 2 per cent beneficiaries in the region invested in watershed development and the amount of intervention was barely Rs 10 thousand for which 100 per cent subsidy was provided. Only beneficiaries in Karnataka reported few watershed interventions. In the east and north-east as well as in the north region only 2-3 per cent beneficiary households reported some interventions under watershed development. In the east and north-east, average intervention was Rs 1 lakh per household while Rs 80 thousand per beneficiary household subsidy was provided under the programme. In the north also the intervention amount was as much as it was in the east and north-east while subsidy amount

was half of that around Rs 40 thousand per beneficiary household. More details about the region-wise details of RKVY watershed interventions are presented in Annex Table 4.1A.

Interestingly, the data at the state level reveals that RKVY provided nearly full subsidy for community tanks in Sikkim state and for check dams in Maharashtra and Meghalaya states. For diggies also similar trend of attracting full subsidy was noticed in Karnataka and Mizoram states. It was also observed during the field survey that in the case of investment on watershed development in private lands, the cost contribution was limited to labour and material contribution. Though, land leveling and bunding activities were not community based, RKVY provided full subsidy for these two interventions. The subsidy was limited to 50 per cent in the case of diggies in Rajasthan, the state where cost of diggies was found generally very high due to less rainfall and dry land nature of the state.

Table 4.1a: Details of interventions undertaken under watershed development

| Intervention | % of watershed Beneficiary | Avg. cost in Rs. | % subsidy | % increase in crop area | % increase in crop productivity | % decrease in cost | % increase in income |
|---|---|---|---|---|---|---|---|
| Farm ponds / Dug wells | 1.44 | 63462 | 72.2 | < 10 % | 10 % to 20 % | < 10 % | 10 % to 20 % |
| Diggies | 1.05 | 370649 | 49.6 | Above 50 % | 10 % to 20 % | < 10 % | 10 % to 20 % |
| Check dams | 0.24 | 207383 | 98.7 | No change | 10 % to 20 % | < 10 % | 20 % to 30 % |
| Lining of tanks / ponds | 0.57 | 111401 | 51.8 | < 10 % | < 10 % | < 10 % | 10 % to 20 % |
| Community tanks | 0.11 | 260333 | 95.0 | 20 % to 30 % | < 10 % | < 10 % | 10 % to 20 % |
| Restoration / renovation of small tanks | 0.24 | 75853 | 48.5 | 10 % to 20 % | < 10 % | < 10 % | 10 % to 20 % |
| Pipe / precasted distribution system | 0.28 | 63704 | 38.0 | No change | 10 % to 20 % | < 10 % | 10 % to 20 % |
| Desilting of ponds / tanks | 0.15 | 144157 | 39.6 | < 10 % | < 10 % | < 10 % | < 10 % |
| Percolation tanks | 0.02 | 100000 | 40.7 | < 10 % | 10 % to 20 % | No change | < 10 % |
| Nala Bunds | 0.07 | 43001 | 39.2 | 20 % to 30 % | 20 % to 30 % | 10 % to 20 % | 30 % to 50 % |
| Land leveling | 0.23 | 24014 | 100.0 | 20 % to 30 % | 10 % to 20 % | <10 % | 30 % to 50 % |
| Bunding | 0.18 | 75378 | 100.0 | < 10 % | 10 % to 20 % | No change | < 10 % |
| Others | 0.06 | 83861 | 33.4 | No change | < 10 % | <10 % | 10 % to 20 % |
| Total | 4.67 | 151926 | 58.8 | < 10 % | < 10 % | <10 % | 10 % to 20 % |

Expansion of cropped area, augmentation of productivity per unit of area, reduction in cost of cultivation and increased farm incomes are the main indicators that ascertain impact of watershed development interventions in the area where such interventions are carried out. Results demonstrate that beneficiaries noticed less than 10 per cent increase in productivity and decrease in costs when compared from pre to post RKVY intervention. This alarms the need to concentrate more on watershed development under RKVY as well as in other developmental programs. However the combined effect of increase in productivity and fall in cost of cultivation resulted in enhancement of farm income to the tune of 10 to 20 per cent (Table 4.1a). This impact was observed mainly in central and western India and is limited to those households who had under taken intervention. Watershed intervention such as check dams, nalabunds and land leveling enhanced beneficiaries income better than other interventions. Such benefits were also observed in the studies of Chandrakanth et al (2004) in Karnataka, Reddy et al. (2004) in Andhra Pradesh and Shah (2001) in Gujarat. All these studies have reported increased cropped area, improvement in water table and increased income.

### 4.1.2 Soil Testing

Soil testing is an important intervention under NRM sector. Soil analysis is essential for the farm household as it determines the inputs and necessary soil amendments required for sustainable agricultural production (Srivastava and Pandey, 1999). The best time to take the

soil sample is after the crop is harvested. Soil testing is becoming essential given the fact that with the rising level of irrigation due to increased budget for the same has led to increase in cropping intensity and production that has negative consequences in terms of water logging and salinity of soil. As per the available literature, substantial areas in Uttar Pradesh, Rajasthan, Gujarat, Haryana, Punjab and some other states, is affected by water logging and salinity. If this problem is not addressed timely through soil amendments and through soil treatment, a considerable area may become barren land. Integrated soil management approach that includes components of NRM is becoming essential considering socioeconomic aspects, monitoring and maintenance of irrigation schemes and re-use and or safe disposal of drainage water, etc. (GoI, 2009).

Soil testing under RKVY programme aims at determining the status of the soil health and recommending ways and means of maintaining its health. For this purpose RKVY funds for the soil test in designated laboratories which provide the beneficiaries a report card and also recommend for the possible improvements in the soil through various measures. In our survey, the main focus was to assess if the soil testing was done at the beneficiary farmers fields. The survey also attempted to dig out the periodicity of soil testing, agencies conducting soil test, nature of recommendations given and to what extent the farmer was following the recommendations. The beneficiary households were enquired regarding testing of soil under RKVY programme. As seen in Table 4.1b, at the aggregate only 0.5 percent of the beneficiary household did soil testing under RKVY programme. In southern region, none of the sample households were found to have tested their soil under this scheme. In the east and north-east and north regions, around 1 percent of the beneficiaries did soil testing in different laboratories. The places where soil testing was done included mobile soil testing laboratories, agricultural colleges, agricultural department facilitated laboratories and others. In the west and central region, Maharashtra was the only state where beneficiaries tested soil either in mobile testing labs or in agricultural department facilitated labs. In east and north east, out of the 12 states only in Assam, West Bengal and Mizoram beneficiaries did soil testing. In the north region, soil testing by beneficiary was observed in Punjab, Himachal Pradesh and Uttar Pradesh.

Table 4.1b: Soil testing under NRM

| Sl. No. | Region | % of beneficiaries tested soil | **Place of soil test (%)** | | | |
|---|---|---|---|---|---|---|
| | | | Mobile soil testing laboratory | Agricultural colleges | Agricultural department facilitated labs | Others |
| 1 | South | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 2 | West and Central | 0.2 | 25.0 | 0.0 | 75.0 | 0.0 |
| 3 | East and North-east | 0.8 | 7.5 | 2.5 | 55.0 | 35.0 |
| 4 | North | 0.8 | 0.0 | 35.3 | 64.7 | 0.0 |
| All India | | 0.5 | 6.5 | 11.5 | 59.0 | 23.0 |

The various types of interventions carried out under NRM for major crops under RKVY programme are presented in Table 4.1c. These interventions included application of lime/gypsum, leaching with good water, proper drainage facility, usage of tolerant varieties, application of micronutrients and others. Among the selected households, only around 1 percent availed these benefits under the broad category of Natural Resource Management. The average area treated under this sector was 3.8 acres. The intervention cost on NRM per household was around Rs 22 thousand on average for which subsidy amount given was Rs 15 thousand that is around 70 percent of the total investment. Majority of the selected

households chose to apply lime/gypsum followed by micronutrients as a part of the NRM programme. It is important to note that although only 0.04 percent beneficiary availed intervention benefits for drainage facility, the average area covered was relatively higher (around 53 acres on average) and intervention cost was Rs 1.4 lakh which was completely subsidised. Similarly, whole intervention cost was fully subsidy in the case of usage of tolerant varieties and application of lime/gypsum, although the average investment was Rs 5 thousand or less for both. These interventions although were taken at a small scale but majority of the beneficiary households indicated improvement in soil health after the treatment of the soil through various measures.

Table 4.1c: Benefits received under soil testing and related programmes of NRM sector

| Benefit | % of beneficiaries | Avg. area treated (acres) | Avg. cost (Rs.) | % subsidy | % increase in crop productivity | % decrease in cost | % increase in income | % of HH having said improvement in soil health |
|---|---|---|---|---|---|---|---|---|
| Lime / Gypsum applied | 0.40 | 2.7 | 5843 | 99.3 | < 10 % | < 10 % | 10 % to 20 % | 84.85 |
| Leaching with good water | 0.04 | 4.3 | 7667 | 85.7 | No change | No change | 30 % to 50 % | 66.67 |
| Drainage | 0.04 | 53.4 | 135120 | 100.0 | < 10 % | No change | < 10 % | 100.0 |
| Use of tolerant varieties | 0.04 | 1.5 | 2287 | 100.0 | No change | < 10 % | No change | 33.33 |
| Micronutrients applied | 0.13 | 1.4 | 3459 | 87.3 | < 10 % | No change | < 10 % | 100.0 |
| Others | 0.43 | 1.5 | 36674 | 54.4 | < 10 % | No change | < 10 % | 25.71 |
| Total | 1.08 | 3.8 | 22156 | 69.5 | < 10 % | < 10 % | < 10 % | 61.36 |

Out of total soil testing beneficiaries, about 70 per cent of these beneficiaries were concentrated in the east and north east region (Annex Table 4.2A). In South, Karnataka was the only state that undertook intervention under NRM. Benefits were availed for drainage and application of micronutrients. Only 0.14 percent of the selected households availed these benefits. The intervention was completely subsidized for these two activities and it averaged at Rs 2 lakh per beneficiary households. In the west and central region, only 0.3 percent of beneficiary availed NRM and the area treated was around 3 acres on average while intervention cost per household was only Rs 9 thousand with a subsidy provision of 71 percent. Gujarat and Maharashtra were the only two states that participated in NRM programme. In both these states, lime/gypsum application was the primary activity for which complete subsidy provision was made. In the east and north-east region, 2.2 percent of the beneficiary households participated in NRM and average intervention cost was around Rs 24 thousand of which 61 percent subsidy was given under RKVY. Assam, Meghalaya, Mizoram and West Bengal participated in some of the NRM programmes as listed in the table. In the north, there was only some minor participation in NRM programme as only 0.88 percent of beneficiary availed subsidy under NRM and it was confined only to lime/gypsum and micronutrient application. Uttar Pradesh state made some attempts in soil amendments on sugarcane crop by way of lime or gypsum application, drainages and supplying tolerant varieties.

Table 4.1d presents the frequency table on overall impact of watershed and soil testing and related programmes of NRM sector. The impact of interventions was assessed in terms of increase in income and productivity and decrease in cost of production. Results of the opinion survey indicated that about 10 per cent of the beneficiaries have not responded when they were asked about the intervention impact. No change in crop productivity, income and cost was reported by 11 percent, 27.3 per cent and 6.8 per cent of beneficiary, respectively. Majority of the beneficiaries have opined less than 10 per cent change in the productivity, income and costs. As the programme was limited to only a miniscule numbers of households, one cannot expect much bigger change occurring as a result of such minor interventions.

Nonetheless, these interventions led to some improvement in soil health and some improvements in productivity and reduction in cost of cultivation of the beneficiary farmers.

Table 4.1d: Overall Impact of soil testing and related programmes of NRM sector

| Overall impact of interventions | % beneficiaries reported | | | | | | |
|---|---|---|---|---|---|---|---|
| | No change | < 10 % | 10 to 20 % | 20 to 30 % | Above 30 % | Availed but not responded | Total |
| Increase in crop productivity | 11.4 | 33.0 | 13.6 | 10.2 | 21.6 | 10.2 | 100.0 |
| Increase in income | 27.3 | 28.4 | 10.2 | 8.0 | 16.0 | 10.2 | 100.0 |
| Decrease in cost of production | 6.8 | 25.0 | 22.7 | 8.0 | 27.3 | 10.2 | 100.0 |

## 4.2 Organic farming

Increasing awareness of negative externalities of health and environmental issues due to intensive use of chemical fertilizers has led to the development of organic agriculture. The benefits of organic products in terms of health and nutrition are well known to producers and consumers. Organic farming provides an assured alternate solution to avert hazards of chemical fertilizers and pesticides not only on human beings but also on natural resources including agriculture. For this reason, organic farming has gained attention not only in India, but all over the world. In view of its growing importance for promoting sustainability in agriculture, which indeed is one of the components of food security, Government of India in its 10$^{th}$ Five Year Plan approved National Project on Organic Farming (NPOF) on pilot basis. Beside this, the government is promoting organic farming through various other schemes apart from RKVY: National Horticulture Mission (NHM), Horticulture Mission for North East and Himalayan States (HMNEH), National Project on Management of Soil Health and Fertility (NPMSH&F), Network Project on Organic Farming by Indian Council of Agricultural Research (ICAR) and so on.

RKVY programme also encouraged organic farming by providing subsidy for installation of organic units and provision of organic inputs. Crop rotation, green manuring and biological control of pests are three major components within organic farming sector. Creating awareness among the farming community by means of training and demonstration is imperative to promote organic farming practices in addition to the monetary aid. Composting is another important component of organic farming. In addition to training, adoption of composting techniques requires financial support for farmers. Hence, the farmers were provided subsidy to popularize composting in lieu of chemical fertilizers.

Most of the states spent some amount towards organic farming. As per RKVY website data, a total amount of Rs 676.4 crore was spent for implementing 156 projects all over the country (except Maharashtra and Mizoram states) under RKVY during the 11$^{th}$ Five Year Plan. Our primary survey covered beneficiaries of organic farming in 18 states where intervention were taken up to promote organic farming among farmers. These beneficiaries constituted a little more than 5 per cent of the total sample beneficiaries. Nearly half of the organic farming beneficiaries were located in 4 states belonging to northern state viz., Uttar Pradesh, Uttrakhand, Jammu and Kashmir and Himachal Pradesh.

The data pertaining to physical and financial aspects on various types of composting methods was collected from organic farming beneficiaries. Among 10 types of composting methods, vermi-composting method was found to be the most popular since 56 per cent of the beneficiary farmers followed this method. The pit method was adopted by 30 per cent of the

beneficiary farmers. The remaining beneficiary farmers followed other methods like heap method, Japan Method, NADEP method, Gobar gas slurry method and Azolla cultivation. However, no sample household was found to have installed bio-digester. Table 4.2a provides region-wise percentage of organic farming beneficiaries to their respective sample and other details.

Under organic farming, the interventions were carried out for production of compost, earthworms and slurry. Statistics presented in Table 4.2a indicate that households availed benefit for construction vermi-compost or compost pit. Generally beneficiaries constructing one unit but in some cases households also availed subsidy benefit for two to three composting pits (vermi/FYM). The intervention cost per household ranged between Rs 22 to 25 thousand in the west and central and north regions. Per household intervention cost varied from round Rs 15 thousand in Uttrakhand and Orissa to Rs 61 thousand in Jammu and Kashmir. Out of the total intervention investment by the beneficiary households that averaged at Rs 24 thousand, RKVY met about 57 per cent through subsidy at the aggregate. Among different regions also same pattern was observed except in the case of east and north-east region which extended subsidy to nearly 65 per cent of total construction cost. The subsidy received by beneficiaries of West Bengal and Tripura states was more than 75 per cent and it was even higher at 83 per cent in case of Manipur. On average, beneficiaries in the south and east and north-east used more than 70 percent of the production for own farm use. In the west and central region, beneficiaries reported that they used 57 percent of production for their own farms while beneficiaries in the north region reported 62 percent share for own use.

Table 4.2a: Details of composting method under organic farming

| Regions | % beneficiaries to their respective sample size | Actual cost of construction of pit or vermi compost structure (per HH) | Subsidy provided as a % of actual cost | Value of Compost produced per HH (Rs) | Value of Earthworm produced per HH (Rs) | Value of Slurry produced per HH (Rs) | % value of production used in own farm |
|---|---|---|---|---|---|---|---|
| South | 3.49 | 24410 | 52.00 | 13562 | 2825 | 373 | 71.55 |
| West and Central | 3.24 | 21936 | 55.19 | 7861 | 803 | 28 | 56.69 |
| East and North-east | 3.84 | 22937 | 64.95 | 6360 | 1146 | 175 | 77.33 |
| North | 9.61 | 25191 | 54.54 | 8225 | 1696 | 216 | 62.30 |
| **All India** | 5.09 | 24038 | 56.87 | 8346 | 1562 | 197 | 66.41 |

It is observed from Table 4.2a that the beneficiaries recovered their investment cost within a short span as after investment, farmers obtained final output in the form of compost, earthworm or slurry which was available within a period of four months to one year and in many cases output was available twice or thrice in a year. The establishment of compost unit could produce three types of positive impact on beneficiaries; firstly, cash income by sale of surplus compost production and earth worms; secondly, savings by way of restricting fertilizer purchase; third and most importantly, averting hazardous effects of chemical fertilizers.

Apart from providing subsidy for establishment of composting unit, RKVY extended subsidy for treating the beneficiaries' land with other types of organic composts. Thus, there were two components of intervention under organic farming, viz., construction of vermi-compost units as per the detailed information presented above and under the second component, farmers were also provided subsidized inputs for under taking organic farming. The treatment was done on the fields of vermi-compost unit beneficiaries and also on others. The survey collected data about treatment from same beneficiaries who had benefited with vermi-

compost units. The inputs included FYM compost, vermi-compost, bio gas waste, bio fertilizer and green manure. Table 4.2b provides details of these inputs disbursed or subsidy provided for these inputs while around 5 per cent of the sample beneficiaries at the aggregate availed the benefits under such interventions. Areas covered under FYM/compost and vermi compost were 2 acres each, while green manures covered an area of 3 acres. A higher proportion of beneficiaries availed vermi-compost for their land (3.6 per cent beneficiaries treated on average compared to around 0.6 per cent or less beneficiaries using FYM compost, bio fertilizers and green manures). Beneficiaries reported a higher average cost for vermi compost at around Rs 4 thousand (with 36 percent subsidy) than FYM/ compost (only Rs 865 with 50 percent subsidy), bio-fertilizers (Rs 316 with 100 percent subsidy) and green manures (Rs 1.5 thousand with 35.7 percent subsidy). The application was done for beneficiaries growing foodgrain crops like paddy and wheat, horticultural crops like fruits and vegetables and other commercial crops.

Table 4.2b: Details of various type compost applied and its impact

| Type of treatment | % of beneficiaries whose land was treated | Area Covered per HH (Acres) | Qty. Supplied per HH (Kg) | Cost of treatment per HH (Rs) | % of Subsidy provided | % increase in Crop productivity | % Decrease in Cost | % increase in income |
|---|---|---|---|---|---|---|---|---|
| FYM Compost | 0.64 | 2.00 | 690 | 865 | 50.00 | < 10 | < 10 | < 10 |
| Vermi compost | 3.63 | 2.00 | 560 | 4057 | 36.45 | < 10 | < 10 | < 10 |
| Bio-gas waste | 0.02 | 0.01 | 3733 | 0 | 0.00 | 10 to 20 | No change | 10 to 20 |
| Bio-fertilizers | 0.06 | 1.00 | 380 | 316 | 100.00 | < 10 | < 10 | 10 to 20 |
| Green manures | 0.29 | 3.00 | 360 | 1578 | 35.72 | < 10 | < 10 | < 10 |
| Others | 0.15 | 4.00 | 384 | 2775 | 15.56 | < 10 | < 10 | < 10 |
| Total | 4.80 | 2.00 | 550 | 3374 | 36.44 | < 10 | < 10 | < 10 |

The impact of these interventions would take a couple of years to materialize. As recorded during survey, nearly 60 per cent of the interventions were carried out during the last two years of RKVY implementation. Hence, the impact on productivity growth as well as cost reduction remained uniformly below 10 per cent in almost all the states. Bio-gas waste intervention showed 10 to 20 per cent increase in productivity and income level. In some states like in Andhra Pradesh, Assam and Haryana 20 to 30 per cent increase in productivity was reported.

Table 4.2c: Overall Impact of Organic Farming

| Overall impact of intervention | % beneficiaries reported | | | | | |
|---|---|---|---|---|---|---|
| | No change | < 10 % | 10 to 20 % | 20 to 30 % | Above 30 % | Total |
| Increase in crop productivity | 4.3 | 58.9 | 29.6 | 4.1 | 1.5 | 100.0 |
| Increase in income | 27.8 | 60.5 | 7.4 | 1.5 | 1.1 | 100.0 |
| Decrease in cost of production | 4.6 | 48.2 | 37.0 | 5.9 | 2.8 | 100.0 |

Table 4.2c presents the frequency table on overall impact of organic farming interventions. About 27.8 per cent of the beneficiaries reported no change in the income, whereas only less than 5 per cent of the beneficiaries revealed no change in crop productivity and production cost. Similar to the NRM beneficiaries, majority of the organic farming beneficiaries also opined less than 10 per cent and 10 to 20 per cent increase in the productivity, income and costs. Another study by Ramesh et al., (2010) on certified organic and conventional farms revealed reduction in crop productivity by 9.2 per cent but increase in profit by 22 per cent

due to the premium price and reduced cost of cultivation by 11.7 per cent and in the long run improved soil quality. There is less demand for organic products within the country due to higher market price as compared to the conventional products. Bringing more farmers under organic farming should be encouraged for enhancement of organic production that would in the long run bring competition among the organic products and shall increase the demand for the same. Additionally strengthening organic value chain is essential through establishing markets and value addition.

## 4.3 Fishery

Under RKVY, fishery sector implemented 552 projects covering all the states by incurring an expenditure of Rs 993 crores during the 11$^{th}$ FYP. This constitutes around 10 per cent of total number of projects implemented and 3.59 per cent of the total expenditure incurred during the 11$^{th}$ Plan period. Nearly 60 per cent of fishery projects were implemented in Kerala, Tamil Nadu, Chhattisgarh, Madhya Pradesh, West Bengal and Uttar Pradesh (MoA, 2014). The sample beneficiaries covered from fishery sector in our primary field survey therefore belong to mainly these states.

The subsidy was given for fixed capital investment and recurring expenses under the fishery sector. It was observed during the primary field survey that the major items of capital investments were: (i) construction of new ponds or tanks, (ii) repair and renovation of existing ponds or tanks, (iii) purchase of equipments like nets, gears, ice boxes and so on and (iv) purchase of small pedal boats in few cases. Purchase of fingerlings, manure and feed concentrates were the major recurring expenses. The fishery beneficiaries constituted 2.97 per cent of total RKVY sample, representing each item of capital investments and recurring expenses. Most of the sample beneficiaries availed subsidy for one or two items of capital investments and/or for all the items of recurring expenditure.

### 4.3.1 Construction of ponds and tanks

The cost of constructing a pond and tank depends on its dimension and type of material used and labour costs. The data collected has shown that various dimensions of ponds and tanks were constructed based on land and water availability. The pond or tank storage capacity varied from 30 cubic feet to 6.4 lakh cubic feet. Most of the sample beneficiaries were possessing pond having a storage capacity ranging between 1000 to 4000 cubic feet. Despite wide variation in length and breadth, the depth of ponds remained at 3 to 6 feet uniformly among the sample beneficiaries. The size and area of ponds constructed for inland fishery purpose showed proportional relation with size of landholding. Details of construction of ponds or tanks by the beneficiaries are presented in Table 4.3a.

The observations collected from beneficiary households indicate that the construction cost of a pond or tank varied widely across regions. It was lowest in the west and central region, Rs 68 thousand, followed by east and north-east Rs 98 thousand, south region Rs 1.2 lakh and north region almost Rs 2 lakh per household. Among different states, the cost per beneficiary households varied from Rs 13 thousands in Manipur to Rs 4 lakh in Arunachal Pradesh. The large deviation in construction cost per household in different states may be attributed to following reasons**:** (i) the dimension of the tanks varied from beneficiary to beneficiary in each state (ii) number of households constructing the ponds also varied. More number of sample beneficiaries constructed ponds/tanks in Chhattisgarh, Mizoram, West Bengal and

Uttar Pradesh states, and (iii) the numbers of ponds/tanks constructed by each beneficiary household.

Interestingly, sample beneficiaries constructed 2 to 3 pond in Manipur state and as high as 6 to 7 pond in Tamil Nadu. Furthermore, the cost per household was lowest in Manipur as construction cost per household was as low as Rs 8 thousand per pond. In Arunachal Pradesh, on the other hand, cost per household was highest as construction cost per household was Rs 2 lakh per pond may be due to the difference in dimension of ponds. At the aggregate, the subsidy amount for the construction of ponds was Rs 42 thousand per beneficiary household that was around 38 per cent of the intervention cost which averaged at the aggregate Rs 1.1 lakh per household. The proportion of subsidy varied from 13 per cent in Himachal Pradesh to 68 per cent in Jammu and Kashmir. The sample beneficiaries in Mizoram received almost full subsidy.

Table 4.3a: Details for construction of ponds/tanks by the beneficiaries

| Regions | % beneficiaries to sample size of respective region | Average cost per unit per HH (Rs.) | % Subsidy to cost (Rs.) |
|---|---|---|---|
| South | 0.62 | 118889 | 21.21 |
| West and Central | 1.91 | 68169 | 36.84 |
| East and North-east | 2.41 | 97731 | 58.66 |
| North | 1.41 | 195828 | 17.26 |
| **All India** | 1.72 | 111710 | 37.80 |

### 4.3.2 Purchase of equipments

Availability of good equipments is another essential requirement for development of fishery sector in the country. Nets and gears were the most commonly supplied equipments to fishery beneficiaries under RKVY programme. Other instruments supplied included, ice box, insulate box and fetal hundi to fishery beneficiaries. Additionally pedal boats were also provided to few beneficiaries. Table 4.3b shows the details pertaining to purchase of equipments. The sample beneficiaries who purchased fishery equipments accounted for about 1.8 per cent of total sample beneficiaries which also included beneficiaries of pond construction. Among the regions, west and central region did not participate in this particular activity.

The average household cost of equipments at aggregate was found Rs 10.6 thousand that varied from Rs 17.5 thousand in the south region and around Rs 8 thousand in the east and north-east and north region while no intervention was done in the west and central region. Among different states, the instruments cost ranged from Rs 2.7 thousand per household in Manipur to Rs 10.6 thousand in Himachal Pradesh. Unlike construction of ponds, the cost of equipments per household depended upon the numbers of equipments purchased by the beneficiaries. The beneficiary on average acquired 3 to 4 equipments. The cost varied not only with the numbers of equipments acquired but also the types of equipments purchased and hence, the cost per equipment differed from Rs 750 per equipment in Punjab to Rs 8 thousand in Jammu & Kashmir.

Fishery equipment intervention for southern region was reported by Andaman and Nicobar, where the number of equipments availed was found to be precisely one per beneficiary. The per household cost and per equipment cost remained high as all sample beneficiaries availed

costly equipments. Interestingly, there was not much difference in the subsidy availed across regions. Whereas the state level figures showed significant variation ranging from two-third proportion of subsidy in Mizoram and to as high as full subsidy in Uttar Pradesh and Himachal Pradesh.

Table 4.3b: Details of beneficiaries for purchase of equipments

| Regions | % beneficiaries to sample size of respective region | Average cost per unit per HH (Rs.) | % Subsidy to cost (Rs.) |
|---|---|---|---|
| South | 2.60 | 17518 | 57.23 |
| West and Central | 0.00 | 0 | 0.00 |
| East and North-east | 2.30 | 7754 | 54.05 |
| North | 2.05 | 7864 | 58.57 |
| **All India** | 1.76 | 10675 | 54.82 |

### 4.3.3 Recurring expenses

Meeting recurring expenses is one of the hurdles being encountered by fishery beneficiaries and hence this component was also included in the RKVY programme. Timely availability of fingerlings or seed and feed concentrates were the main items of recurring expenses for fishery farmers. At times, they also have to meet the repair and maintenance of equipments. Therefore, data was also collected from the sample beneficiaries on these components. Table 4.3c presents the details of recurring expenses of fishery farmers.

Table 4.3c: Details of recurring expenses of fishery farmers

| Regions | % beneficiaries to respective total sample size | Average cost per HH (Rs) | % Subsidy to cost (Rs) |
|---|---|---|---|
| South | 0.48 | 23046 | 50.16 |
| West and Central | 0 | 0 | 0.00 |
| East and North-east | 4.49 | 5787 | 62.56 |
| North | 3.71 | 8639 | 23.78 |
| **All India** | 2.96 | 6369 | 39.49 |

Note: Recurring expenses includes purchase of fingerlings / seeds, manures lime, concentrates, etc.

The number of sample beneficiaries who approached RKVY for inputs included those who also have availed benefits for capital investment. Hence, the percentage of sample beneficiaries of recurring expenses was higher as compared to sample beneficiaries for the capital investment. The beneficiaries who received subsidy benefits under recurring expenses belonged to Manipur, Mizoram and West Bengal states of east and north-east region and in the north region all states were covered except Uttrakhand and Haryana. Only Tamil Nadu represented the southern region while in the west and central region no intervention was done on recurring expenses.

As could be seen from Table 4.3c, the cost of inputs per household varied slightly between east and north-east (Rs 5.8 thousand) and north region (Rs 8.6 thousand). But, in southern region the cost per unit of input per household was much higher (Rs 23 thousand). This variation was because of difference in the variety of inputs used and the price variations at local markets. Even in Utter Pradesh the cost was high at Rs 10.4 thousand per household. The subsidy share of the cost varied from 24 per cent in the north, 50 per cent in the south

and above 60 per cent in the east and north-east while at aggregate share of subsidy in total cost was 40 per cent. Among different states, subsidy rate ranged between 25 per cent in Uttar Pradesh to 100 per cent in Mizoram.

Increase in quantity of fish production leading to increased income of farmers is used as an indicator to judge the impact of fishery under RKVY programme. Table 4.3d shows details about overall impact of fishery sector on increase in fish production and income for all beneficiary farmers irrespective of the type of benefits availed by them under fishery. The difference in quantity of fish produced before RKVY intervention and after intervention is considered as the impact of intervention. Corresponding increase in income level of farmers is also taken as a criterion for the impact assessment.

Table 4.3d reveals a positive impact of intervention on both quantity of fish production as well farmers increase. The impact looks more impressive in terms of percentage increase in production compared to absolute amount because in many states fishery intervention led to new initiatives whereby new farmers came up into fishery production. Among different states, Jammu and Kashmir recorded an increase of more than 84 quintals fish production followed by Mizoram with 32 quintals Increase.

Table 4.3d: Overall impact of interventions on fish production and income

| Regions | % beneficiaries to respective total sample size | Avg. cost per unit per HH (Rs.) | % Subsidy to cost (Rs.) | % increase in fish production per HH | Avg. increase in fish production per HH (Qtls) | % increase in income per HH |
|---|---|---|---|---|---|---|
| South | 3.76 | 34673 | 31.88 | 178.83 | 12 | 174.45 |
| West and Central | 3.72 | 35703 | 36.18 | 32.07 | 6 | 41.48 |
| East and North-east | 10.64 | 29455 | 52.90 | 119.80 | 14 | 82.12 |
| North | 8.63 | 53112 | 27.73 | 436.30 | 23 | 427.44 |
| All India | 7.32 | 37668 | 38.76 | 132.94 | 14 | 113.71 |

Note: Figures in parenthesis indicates percentage increase

The impact of RKVY programme implemented during the 11th Plan on inland fishery sector was quite impressive and far reaching as the programme generated not only tangible benefits but also many benefits were non-tangible as explained below:

- Constrained by large capital investment requirement, farmers were not venturing to inland fishery sector before RKVY intervention. This was especially the case with small and marginal farmers. It has been found from the results of sample beneficiary survey that many farmers started fishery only after initiation of RKVY programme. Examples for this can be seen in Andaman and Nicobar Islands where more than 50 per cent of the sample beneficiaries were new entrants. At the aggregate, more than 16 per cent of the total fishery sample beneficiaries did not own any pond or tank before the launch of RKVY programme. These beneficiaries came forward to construct new ponds only after RKVY extended its helping hand. The new entrants into fishery sector were especially conspicuous in Mizoram and Uttar Pradesh states. While about 37 per cent of Mizoram beneficiaries turned out new entrants, in Uttar Pradesh the proportion of pnew entrants stood at more than 90 per cent. The states of Tamil Nadu,

Chhattisgarh, West Bengal and Himachal Pradesh provided a clue that they would follow the trend in the coming years.

- The survey indicated that about 1 per cent of total sample households took advantage of RKVY to repair and renovate their existing ponds. These farmers were spread across 7 states, though in very small numbers. Uttar Pradesh and West Bengal took lead in this particular activity. This indicates that those who had tried fishery earlier on their own and refrained from continuing due to financial difficulties, have come back with RKVY support. This is also considered as an important impact of RKVY programme on fishery farmers.
- Before RKVY intervention, the farmers were using old indigenous equipments. With financial assistance from RKVY, farmers abandoned their earlier indigenous equipments and went for new modern equipments. Some states like Uttar Pradesh and Himachal Pradesh went beyond replacing their old equipments. They purchased additional equipments as well.

It can be concluded that fishery has left its mark on the farming community and it would be worth supporting them in all possible ways.

## 4.4 Sericulture

Sericulture is one of the important income generating sectors of Indian agricultural economy. However, climatic factor does matter to take-up sericulture by farmers in different states. Still, RKVY did not restrict any state to invest in this sector. The sericulture interventions were implemented in 14 states. By the end of 11$^{th}$ Plan, an expenditure of Rs 107 crore was utilized for 61 projects. Kerala, Jammu and Kashmir and West Bengal are noteworthy as they implemented half of the total number of projects implemented all over the country. The remaining states implemented 2 to 3 projects during the entire RKVY period. Total amount spent on sericulture as a proportion of aggregate amount during the 11$^{th}$ Plan was only miniscule.

In our beneficiary survey, we collected data mainly about Disease Free Layings (DFLs) and silkworm rearing houses. Sericulture beneficiaries constituted only 0.72 per cent of total RKVY sample beneficiaries. Out of all the states surveyed only in five states namely Maharashtra, Arunachal Pradesh, Mizoram, Jammu and Kashmir and Uttar Pradesh the surveyed beneficiaries obtained intervention benefits for sericulture. Details of interventions among selected beneficiaries are given in Table 4.4a. All the beneficiaries received subsidy for DFLs. On average, households were growing one to two rearings per year. For every rearing 100 to 150 DFLs were received by the beneficiary farmers. The numbers of rearings in Maharashtra were 3 to 4 per annum and they received 150 to 600 DFLs per rearing. The value of DFLs received per HH in Maharashtra was much higher than the other states. On the other hand, Arunachal Pradesh undertook a few rearings and the numbers of DFLs per rearing were also smaller and therefore per household DFL benefit availed were found to be the least. The beneficiaries of Uttar Pradesh and Arunachal Pradesh were not given any subsidy for DFLs, while other three states received full subsidy for DFLs.

The subsidy for construction of silkworm rearing house was more helpful to farmers since it was relatively expensive and not easily affordable for them and RKVY funded for construction of rearing house in all the five states. The cost varied from Rs 31 thousand in

Arunachal Pradesh, Rs 38 thousand in Mizoram, Rs 51 thousand in Jammu and Kashmir, Rs 66 thousand in Uttar Pradesh and Rs 1.1 lakh in Maharashtra. At the aggregate intervention cost for construction of silkworm rearing house cost was Rs 49 thousand per household. The subsidy proportion varied from 35 per cent in Maharashtra to 91 per cent in Mizoram and at the aggregate subsidy provision averaged at 68 per cent. Maharashtra beneficiaries reported no change in productivity in sericulture after the intervention, while Mizoram beneficiaries reported 30 to 50 per cent jump in cocoon production and income. The remaining three states showed a moderate impact of 10 to 20 per cent in the cocoon production and income.

Table 4.4a: Details of Sericulture beneficiaries

| State | %. of DFL beneficiaries to respective sample | Actual cost of DFL per HH | Subsidy as a % of DFL cost | %. of rearing beneficiaries to respective sample | Avg. cost of rearing house (Rs.) | Subsidy as a % of rearing house cost (Rs.) | % increase in production | % increase in income |
|---|---|---|---|---|---|---|---|---|
| Maharashtra | 2.29 | 22604 | 100.00 | 1.43 | 109400 | 35.83 | No change | No change |
| Arunachal Pradesh | 5.33 | 59 | 0.00 | 5.33 | 31000 | 86.56 | 20 to 30 | 20 to 30 |
| Mizoram | 8.23 | 477 | 100.00 | 8.23 | 38050 | 91.06 | 30 to 50 | 30 to 50 |
| Jammu and Kashmir | 4.80 | 3650 | 100.00 | 2.80 | 50571 | 87.29 | 10 to 20 | 10 to 20 |
| Uttar Pradesh | 0.88 | 1429 | 0.00 | 0.88 | 65714 | 38.04 | 10 to 20 | 10 to 20 |
| All India | 0.72 | 4150 | 95.63 | 0.62 | 48902 | 67.96 | 10 to 20 | 10 to 20 |

## 4.5 Cooperatives

The importance of cooperatives for development of individuals and society as a whole does not need any special emphasis. In order to develop agriculture, states and UTs were funded under RKVY specially to strengthen marketing infrastructure, setting up Self Help Groups, consolidation centers, build cold storages, godowns, etc., for the benefit of farmers. The cooperatives sector was implemented in 13 states with an overall spending of Rs 430 crores (81 projects) during the 11$^{th}$ Plan. About half of the total projects were implemented in the West Bengal state. But this state accounted for only less than 10 per cent of total cooperative expenditure of RKVY. Bihar and Rajasthan were two other states which implemented projects under cooperative sector. Each of these states implemented 8 projects and incurred more than 36 per cent of total cooperative sector expenditure of RKVY. Some states incurred relatively large expenditure though they had implemented one or two projects. For instance, the expenditure of Rs 46.57 crore spent for 2 projects implemented in **Orissa** state is more than Rs 39.92 crore spent by West Bengal for 41 projects. Thus, per project expenditure works out more than Rs 5 crores under this sector during the 11$^{th}$ FYP. The high cost per project should be understood in the sense that the funds were utilized for creating infrastructure for cold storage, marketing, SHGs, etc., which are also the core objectives of cooperative sector. However, it should be noted that under cooperatives sector farmers did not directly derive the benefit under the sector but the projects were mostly community based or collective in nature.

The beneficiary survey covered those farmers who had become members of some cooperatives or groups with the assistance so as to understand the functioning of those groups. This sector covered 0.67 per cent of total sample beneficiaries. Further details are

provided in Table 4.5a. All the sample beneficiaries were members of one or the other farmers group in their respective states under different names. The farmers' group in Gujarat and Maharashtra extended assistance to farmers by providing tractor and other facilities. Farmers in Jammu & Kashmir availed facility for digging bore wells and installing pump sets. It is clearly reflected from the information in the table that charges imposed to members by way of fees and interest seems to be affordable and the assistance provided in terms of financial help was quite significant for individual famers to take initiative to put up infrastructure building in terms of irrigation or reforms on the their field. The impact was measured by additional earnings per household which shows good returns for the farmers although the facility was available only a handful farmers and that also only in few states.

Table 4.5.1a: Details of beneficiaries of cooperative sector

| State | % beneficiaries to respective sample size (members of society/group) | Average amount of assistance received in Rs. (cash + value in kind) | Fee / interest charged as % of assistance (cash + value in kind ) received | Average additional earnings per HH by using assistance (Rs.) |
|---|---|---|---|---|
| Kerala | 3.60 | 32667 | 0.01 | 25409 |
| Gujarat | 0.24 | 500000 | 0.12 | 50000 |
| Maharashtra | 1.43 | 500000 | 0.60 | 46122 |
| West Bengal | 12.80 | 58974 | 0.00 | 23321 |
| Jammu and Kashmir | 0.40 | 877000 | 0.00 | 45000 |
| Uttar Pradesh | 0.75 | 353000 | 0.00 | 103333 |
| All India | 0.67 | 148657 | 0.20 | 80019 |

## 4.6 Integrated Pest Management (IPM)

Application of chemicals was widely used to save the crops from insects and pests. Over the years, it proved to be fatal to human health and to the environment. Therefore, efforts were made to reduce use of toxic chemicals to solve insects and pest problems. Usually, mechanical, cultural and biological methods were combined with chemical methods to manage pest problem. The task of popularizing IPM was attempted by several state and national programs apart from RKVY. The IPM was implemented in 22 states under RKVY. Among these states, Gujarat was the only state which implemented 10 projects. The remaining states, implemented 4 to 5 projects during the $11^{th}$ Plan. By the end of the Plan, an amount of Rs 262 crores was spent to implement 104 numbers of IPM projects across the country. The share of expenditure on IPM was negligible as a proportion to total RKVY expenditure. Similarly, the numbers of projects implemented were very small in relation to total number of projects implemented under RKVY programme.

The beneficiary survey intended to have representation of beneficiaries from each of IPM methods i.e. mechanical, cultural, chemical and biological for analyzing the impact of each of these methods. However, many states concentrated mainly on training and demonstrations since imparting knowledge through training and demonstration was more imperative for popularizing IPM than monetary assistance to farmers. Due to this reason, survey could identify only few farmers in the state of Bihar who benefited by way of receiving subsidy under IPM sector. These identified beneficiaries formed 0.33 per cent of total sample size of the state. The state provided full subsidy to all its beneficiaries. The average subsidy was highest for chemicals Rs 5600, followed by cultural Rs 3833, biological Rs 2086 and

mechanical Rs 2000. The impact of the programme was not available as the process takes longer tike in the conversion into higher productivity and some reduction in cost. Moreover, the sample beneficiary who implemented the same was too small to come out with reasonable outcomes.

Before closing this chapter, we present the aggregate picture about RKVY intervention under major and minor sectors, i.e., the aggregate percentage of beneficiary households' participation in the programme; the volume of intervention carried out; and the extent of subsidy provided under the programme. Table 4.6 presents the percentage of selected beneficiary households' participation in different projects under RKVY and Table 4.7 presents the average amount of investment made by the households and the extent of subsidy provided under RKVY. Crop development, horticulture sector and agriculture mechanization had the highest participation of households in which more than 20 per cent of the selected beneficiaries participated in most of the regions and at the aggregate. Animal husbandry micro/minor irrigation had more 15 per cent of the selected households' participation. Others were all minor activities whereby fisheries, organic farming and NRM had around 5 per cent of the selected households' participation while sericulture and IPM had almost negligible presence among the selected beneficiaries. It is clear from the table that around 30 per cent households participated more than one programme at the aggregate and the double participation among the households was highest in east and north-east and least in the north.

Regarding the volume of intervention carried out under RKVY, the above mentioned major sectors had the intervention that varied from above Rs 85 thousand per household in the case of mechanization and micro and minor irrigation each, Rs 64 thousand for animal husbandry, Rs 30 thousand for horticultural infrastructure and crop development combined and less than Rs 2 thousand for crop development. Among the minor sectors, intervention was around Rs 1.5 lakh in the case NRM, Rs 38 thousand for fisheries and Rs 24 thousand in the case of organic farming. Sericulture and IPM that had only miniscule participation had average intervention amount of less than Rs 8 thousand and Rs 2.5 thousand per household, respectively. At the aggregate, the total amount of intervention for all the 8174 beneficiary households was around Rs 60 thousand per household.

Table 4.6: Overall percentage of beneficiaries participating in major and minor projects (% of beneficiaries)

| Sectors | South | West and Central | East and North East | North | All India |
|---|---|---|---|---|---|
| Agriculture mechanisation | 26.69 | 26.28 | 18.47 | 15.22 | 20.92 |
| Animal husbandary | 25.46 | 10.00 | 14.52 | 20.59 | 16.96 |
| Fisheries | 3.76 | 3.72 | 10.64 | 8.63 | 7.32 |
| Crop development | 24.23 | 30.16 | 55.55 | 17.80 | 34.65 |
| Horticulture (infrastructure and crop development) | 29.98 | 16.28 | 25.19 | 27.17 | 24.49 |
| Integrated pest management | 0.00 | 0.00 | 1.29 | 0.00 | 0.44 |
| Micro / minor irrigation | 8.21 | 30.80 | 7.26 | 12.88 | 14.25 |
| Natural resource management | 1.92 | 12.61 | 2.08 | 2.88 | 4.67 |
| Organic farming / bio-fertilizers | 3.49 | 3.24 | 3.84 | 9.61 | 5.09 |
| Sericulture | 0.00 | 0.43 | 1.15 | 0.93 | 0.72 |
| All sectors | 123.75 | 133.51 | 139.99 | 115.71 | 129.51 |

Note: Total exceeds 100 per cent due to beneficiaries' participation in more than one sector.

Table 4.7: Overall volume of intervention and subsidy provision under RKVY
(Rs per beneficiary household)

| Sector | Particulars | South | West and Cenral | East and North East | North | All India |
|---|---|---|---|---|---|---|
| Agriculture mechanization | Intervention | 146557 | 53418 | 61751 | 97007 | 85118 |
| | Subsidy | 57659 | 25267 | 24337 | 24520 | 32239 |
| | Subsidy (%) | 39.3 | 47.3 | 39.4 | 25.3 | 37.9 |
| Animal husbandry | Intervention | 26969 | 29875 | 45591 | 130279 | 64246 |
| | Subsidy | 11219 | 16766 | 30268 | 38279 | 25763 |
| | Subsidy (%) | 41.60 | 56.12 | 66.39 | 29.38 | 40.10 |
| Fisheries | Intervention | 34673 | 35703 | 29455 | 53112 | 37668 |
| | Subsidy | 11054 | 12916 | 15582 | 14727 | 14600 |
| | Subsidy (%) | 31.88 | 36.18 | 52.90 | 27.73 | 38.76 |
| Crop development | Intervention | 4253 | 1978 | 1614 | 1298 | 1976 |
| | Subsidy | 2431 | 1608 | 1458 | 804 | 1525 |
| | Subsidy (%) | 57.16 | 81.29 | 90.33 | 61.94 | 77.18 |
| Horticulture infrastructure and crop development | Intervention | 42913 | 71413 | 19995 | 12395 | 30754 |
| | Subsidy | 19660 | 40408 | 17015 | 6535 | 18253 |
| | Subsidy (%) | 45.81 | 56.58 | 85.10 | 52.72 | 59.35 |
| Integrated pest management | Intervention | 0 | 0 | 2522 | 0 | 2522 |
| | Subsidy | 0 | 0 | 2522 | 0 | 2522 |
| | Subsidy (%) | 0.00 | 0.00 | 100.00 | 0.00 | 100.00 |
| Micro / minor irrigation | Intervention | 52847 | 95573 | 33082 | 122579 | 86457 |
| | Subsidy | 35769 | 44990 | 24029 | 73653 | 46901 |
| | Subsidy (%) | 67.68 | 47.07 | 72.63 | 60.09 | 54.25 |
| Natural resource management | Intervention | 12802 | 192339 | 100310 | 106355 | 151926 |
| | Subsidy | 12802 | 111989 | 82348 | 41429 | 89321 |
| | Subsidy (%) | 100.00 | 58.22 | 82.09 | 38.95 | 58.79 |
| Organic farming / bio-fertilizers | Intervention | 24410 | 21936 | 22937 | 25191 | 24038 |
| | Subsidy | 12694 | 12107 | 14897 | 13739 | 13670 |
| | Subsidy (%) | 52.00 | 55.19 | 64.95 | 54.54 | 56.87 |
| Sericulture | Intervention | 0 | 48750 | 630 | 2832 | 7864 |
| | Subsidy | 0 | 48750 | 488 | 2305 | 7617 |
| | Subsidy (%) | 0.00 | 100.00 | 77.46 | 81.39 | 96.86 |
| Total of All sectors | Intervention | 66628 | 85174 | 32503 | 71061 | 60387 |
| | Subsidy | 28774 | 44433 | 19713 | 26821 | 28801 |
| | Subsidy (%) | 43.19 | 52.17 | 60.65 | 37.74 | 47.69 |

Given the scale of intervention, the subsidy amount received by the beneficiary households was highest Rs 89 thousand for NRM, followed by Rs 47 thousand in micro/minor irrigation, Rs 32 thousand for agricultural mechanization, Rs 26 thousand for animal husbandry, Rs 18 thousand for horticulture sector, around Rs 15 thousand for organic farming and fishery sector and less than Rs 10 thousand in all other activities while crop development that has the major participation their subsidy amount was only Rs 1.5 thousand per beneficiary households. At the overall, the subsidy provided to all the selected households averaged at Rs 29 thousand per beneficiary household that was around 48 per cent of the total intervention cost of Rs 60 thousand per household. The impact of RKVY intervention as has been discussed in this chapter and in the previous chapter was not only increase in crop productivity but also reduction in cost of cultivation, better household income from farming and allied activities, saving of precious resources like water and conservation of soil and better quality of agricultural products, better animal health and so on.

# Chapter 5

## Other Achievements and Constraints

One of the objectives of RKVY programme was to address various components of agriculture and allied sectors in a holistic manner. In the process of implementation of the program most of the components/sectors played both direct and indirect role in contributing to the overall development of agriculture. Farmers were provided incentives under various schemes like buying new machines, new seed, fertilizer etc., laying down sprinkler or drip irrigation, installing up green house/poly house and so on. In many cases such investment taken up by the beneficiary households also led to ancillary benefits to the neighboring farmers and agricultural labourers in terms of better information, better access to the machinery and other resources on rental basis, better capacity building of the farmers, better marketing and transportation facilities and at times additional employment to the agricultural wage earners. In our field questionnaire we tried to capture some of these advantages that RKVY programme might have generated in the implementation process. Some of these findings are interpreted in this chapter along with the discussion on the constraints faced by the farmers in availing RKVY scheme. The other miscellaneous information related to different sectors, perception of beneficiaries towards the program, suggestions given by the households during our course of survey and the details of other benefits availed from various other government schemes by the RKVY beneficiaries farmers. The information presented in the chapter is based on the primary household survey carried out by our team.

### 5.1 Training to Beneficiaries

According to Ashley and Maxwell (2001) the agricultural productivity can be enhanced substantially if the human resources employed in agriculture are well trained. This will be possible if a well-timed agricultural education is devised targeting different groups and levels with a decent collaboration of education, training and agriculture policy in the entire country. Among many other reasons, non-skilled workforce, use of low level and time-consumed technology and old fashioned cultivation accounts for the low level of productivity and lower contribution of agriculture sector to the overall development of the economy (Bryceson, 2000 and Barrett et.al, 2003) and that deserves a revolutionary change. Agricultural colleges and Universities were formed in the belief that farm production could be increased as a result of the systematic application of updated technology and dissemination of agricultural research findings (Jamaluddin and Alias, 1997). Agriculture technocrats and scientists have evolved a number of technological measures for developing and enhancing productivity in the agricultural sector. This includes use of improved seeds, chemical fertilizers, modern machinery, integrated pest management, and acquainting farmers' with the new technology and their capacity building through agricultural extension activities. The new technology has been introduced and remains in practice for more than last four decades. However, in spite of adoption of new technology, most of the developing countries have failed to achieve the desired goals of development possibly because of lack of proper understanding and lower adoption rate. In this connection, RKVY program has included training component as an integral part of the extension activities and it encourages convergence of this programme with other programs such as Mahatma Gandhi

National Rural Employment Guarantee Scheme (NREGS), Swarnajayanti Gram Swarozgar Yojana (SGSY) and Backward Regions Grant Fund (BRGF).

Trainings help in creating the awareness, imparting the essential skills, and update and educate farmers about the recent technologies. Depending upon the requirement, many of the sectors had customized training and skill development of stakeholder (farmers/farmer groups/extension workers/entrepreneurs/dealers/processors/exporters etc.) for easy transfer of technology and adoption. These trainings were conducted through the assistance of identified institutions by state departments, for example, State Agricultural Universities (SAUs), Indian Council for Agricultural Research (ICAR) institutions (Krishi Vignan Kendras (KVKs)/Zonal Research Stations (ZRS), State Department of Agriculture (DoAs), technology specific training institutes, for instance, The National Plant Protection Training Institution (NPPTI) for plant protection, National Institute of Agricultural Marketing (NIAM) for Agricultural marketing, etc.

Various types of trainings organized for the farmers and self-help group (SHG) beneficiaries under RKVY program includes, promotion of mechanization; conservation of soil and other natural resources essential for agriculture; increasing production and productivity, post harvest management of agricultural products, processing of farm products with a view to facilitate their marketing; improvement of income and employment opportunities; effective use of land and other natural resources; encouraging rural youth into various branches of agriculture and allied sectors; updating technical developments and their use in practice; livestock and enterprise development (animal husbandry, dairying and fisheries); fodder development; seed production; integrated pest management; use of organic farming and bio-fertilizers etc. However, in most of the states, RKVY funds are used to supplement Agriculture Technology Management Agency (ATMA) funds for such trainings. The summary of the trainings participated by farmers under RKVY during 11$^{th}$ FYP across region in the country are presented in Table 5.1.

Most of these trainings were undertaken by different sectors in the form of demonstration, field visits, participation in Krishi Melas (exhibitions), exposure visits/study tours and other forms such as classroom instruction, workshop, seminars, conferences etc. Among our selected beneficiary households, around 22 per cent undertook training across the country. The proportion was highest about 29 per cent in the case of south region and almost equal proportion around 21 per cent in all other regions. On average, these trainings were conducted for 4 days and the duration was highest in the case of north region, around 6 days while the duration was 2 to 3 days in all other regions. The trainings were given in the form of demonstration in 44 per cent cases, field visits in 29 per cent cases and krishi melas in around 10 per cent cases at the aggregate while other forms of training such as workshops, seminar, conference etc., took place in around 18 per cent cases. In the case of south region, demonstration and field visits formed equal share (45 per cent) and the krishi mela was negligible (3.3 per cent). The case was reverse in the west and central region wherein 47 per cent trainings were in the form of others as mentioned above, followed by krishi melas 22 per cent, demonstrations 17 per cent and field visits 14 per cent. Conversely, demonstration alone accounted for 67 per cent of the training components in east and north east region followed by field visit 22 per cent and krishi melas only 2 per cent. Unlike south region, north region had 37 per cent trainings in terms of demonstration, 35 per cent as field visits, followed by krishi melas and others 14 per cent, each. Even though, training was one of the effective tools for transfer of technology to the farmers/field level, only about 35 per cent of the farmers at the aggregate who obtained training found the same helped in

adoption. The least percentage of farmers who found training helpful was in the east and north-east where only 22 per cent farmers expressed that the training led to adoption. In other regions, around 37 per cent farmers in the south, around 38 per cent in the north and 48 per cent in the west and central indicated training as very helpful as the same led to better adoption and consequently helping in increasing productivity.

Table 5.1: Trainings participated by the beneficiaries in different regions

| Sl. No. | Region | Percentage of beneficiaries undergone training | Avg. no of days of training | Type of training (%) | | | | Percentage of farmers who found training helped adoption |
|---|---|---|---|---|---|---|---|---|
| | | | | Demonstration | Field visit | Krishi mela | Others | |
| 1 | South | 28.7 | 2.0 | 44.9 | 44.6 | 3.3 | 7.2 | 37.0 |
| 2 | West and Central | 20.5 | 3.0 | 16.6 | 13.8 | 22.3 | 47.3 | 47.6 |
| 3 | East and North-east | 21.6 | 3.0 | 67.1 | 22.1 | 2.3 | 8.5 | 22.1 |
| 4 | North | 20.9 | 6.0 | 37.2 | 35.1 | 13.8 | 14.0 | 38.1 |
| 5 | All India | 22.4 | 4.0 | 44.4 | 28.5 | 9.4 | 17.6 | 34.6 |

Looking at the percentage of beneficiaries who participated in the training activities across states (Annex Table 5.1A), in the south region, Puducherry was at the top with 78 per cent of beneficiaries undergone training and almost all portrayed that training helped adoption. Puduchery was followed by Andhra Pradesh, Goa, Andaman Nicobar and Tamil Nadu where more than 26 per cent of the beneficiaries attended training activities that was more than the aggregate average of 22 per cent. Karnataka formed the least, as less than 10 per cent and Kerala only 16 per cent beneficiaries were exposed to training under RKVY program. Interestingly, in all south region, the numbers of training days were limited to two to three only while more than 93 per cent of them expressed that training helped in adoption. In the case of west and central region, in Rajasthan 48 per cent and in Gujarat 29 per cent households indicated having been imparted training while in all other states in the region, less than 15 per cent selected beneficiaries had obtained or undertaken any training activities. The numbers of training days were limited to two to four. Nevertheless, on average only 48 per cent beneficiaries in the region stated training helped in adoption.

In the east and north-east region, Sikkim, Nagaland, Manipur, West Bengal and Jharkhand states revealed more than 23 per cent of beneficiary participation in the training activities, whereas Mizoram followed by Bihar, Assam and Arunachal Pradesh seems to have neglected this component under RKVY because less than 20 per cent of beneficiaries attended these training activities. However, the numbers of days of training to those who participated was up to 6 in this region but very few, only 22 per cent of the beneficiary farmers who had undergone training uttered that training helped in adoption. In the north region, Punjab, Himachal Pradesh and Jammu and Kashmir emphasized more on training components and hence more than 27 per cent of the selected beneficiary farmers had obtained training while in the rest of the states in the north, participation was less than 15 per cent. The number of days of training found to be highest 3 to 11 days in the north region compared to any other states or regions but the percentage farmers obtaining training, very few of them only 35 per cent observed training being helpful or leading to adoption of better technology. Overall, demonstration and field visits were the most preferred type of trainings in all the regions. Awareness camps, *krishi mela* and other

exhibitions, seminars and conferences were limited and conducted once or twice in a year and thereby their contribution was not substantial.

## 5.2 Information Technology (IT)

Exploiting the potential of Information Technology is crucial to develop agriculture sector. Monitoring through information and communication technology along with online training and extension are the most precise objectives of RKVY programme. Dissemination of weather and market related information is another important purpose of supporting IT by RKVY schemes. The projects under IT sector were implemented in 15 states incurring an expenditure of Rs 95 crore. A total number of 28 projects were implemented. Uttar Pradesh alone incurred a quarter of total expenses under IT sector to implement 20 per cent of total projects implemented all over the country. Bihar was another state which took up initiative in the IT sector under RKVY programme by implementing 3 projects at a cost of Rs 13 crore. Andhra Pradesh was the third state which implemented 2 projects and spent Rs 9 crore.

Access to mobile phone by the farmers is vital to extend information technology services to farming community. Therefore, in the sample survey we enquired beneficiaries whether they own a mobile phone if yes how did it help them to gather information related to agriculture. The detailed responses of the selected farmers are presented in Table 5.2. This information was gathered from all beneficiaries to know whether mobile phone is being used for accessing the agriculture related information irrespective of the sector they had received the subsidy benefits.

Table 5.2: Details on usage of mobile phone for agriculture related information

| Regions | % of beneficiaries covered to their respective sample size | Beneficiaries owning mobile (% to interviewed farmers) | Beneficiaries receiving agricultural related SMS (% to beneficiaries owning mobile) | %. of beneficiaries receiving text messages (% to Receiving SMS) | % Receiving text message in local language | %. of beneficiaries receiving voice messages |
|---|---|---|---|---|---|---|
| South | 99.25 | 82.90 | 6.66 | 27.50 | 90.91 | 58.75 |
| West and Central | 94.79 | 87.04 | 11.80 | 33.88 | 98.39 | 61.75 |
| East and North-east | 72.33 | 86.69 | 8.02 | 82.86 | 80.17 | 46.43 |
| North | 99.07 | 94.53 | 4.27 | 35.37 | 79.31 | 37.80 |
| All India | 89.01 | 88.21 | 7.56 | 47.22 | 86.03 | 52.78 |

The data was collected from all the selected beneficiaries but information was missing for around 11 percent selected households and therefore our responses here represent around 89 per cent of the total sample beneficiary households irrespective of the sectors. It can be observed from the table that nearly 12 per cent of the beneficiaries at aggregate did not own a mobile and therefore were not reachable through mobile phone. Highest farmers not having a mobile access were found in the south around 17 per cent in the south and around 14 per cent in the west and central and east and north-east, each and only 6 per cent in the north.

With the advent of telecommunication technology and falling prices of mobile phones, the access to mobile has improved substantially. But the main concern is that the beneficiaries receiving

agriculture related information through short messages (SMS) stood only around 8 per cent of beneficiaries owning mobiles. It is interesting to note that no beneficiary in Kerala and Puducherry in southern region, Bihar, Meghalaya and Sikkim in east and north-east received agricultural information though SMS. The beneficiaries receiving agricultural related SMS remained below 10 per cent in as many as 16 states of the country. Beneficiaries were receiving messages in text and voice format. About 86 per cent of the beneficiaries at the aggregate received voice messages in local languages. The beneficiaries who were receiving messages opined to have received text form and voice form messages. Very high proportion around 86 per cent at the aggregate who were receiving messages accepted that they were receiving text messages in their local languages. The survey enquired if the farmers were spending for receiving messages. Except for few stray cases, the farmers were receiving these SMS services free of cost.

The survey tried to know the type of agricultural information being received by the farmers. The information was classified into: weather related, market related, input related. Since the numbers of beneficiaries receiving SMS itself was very low the percentage of beneficiaries under each category was almost negligible. To conclude, the survey revealed that the farmers were equipped with mobile phones in all the states but Information technology was yet to reach to them.

## 5.3 Employment Generation under RKVY

The most significant link between economic growth and poverty reduction is employment generation. Therefore, Government of India has an array of programmes to increase rural employment in the country. Despite significant growth in the tertiary sector, agriculture remains the mainstay source of livelihoods in India. Recognizing the fact that agriculture still remains the basis of livelihoods of such a large number of people, the Government of India has stepped up its efforts to strengthen Indian agriculture. Rashtriya Krishi Vikas Yojana under National Agricultural Development Program (NADP/RKVY) during the Eleventh FYP, was an important initiative towards decentralization of planning of agricultural development in a holistic manner including the focus on livelihood in relation to the growth of agricultural sector (Datta and Sharma, 2010). It was also designed to provide greater flexibility to the State governments in allocation of resources to the priority areas of development. A study conducted by Nithyashree and Pal (2013) states that although small farmers have benefited from agricultural growth, their income levels are still very low. In general, the income of rural households has increased by 24.97 per cent during the period 2004-05 to 2009-10, and the increase has been the highest for agricultural labours (31.97 per cent), followed by self-employed in agriculture (25.12 per cent) and self-employed in non-agricultural sector (21.80 per cent). Across farm-size, the non-farm sector has played a major role in raising rural income and reducing income disparity across the States. RKVY had both such farm and non-farm activities under agriculture and allied domain to generate employment opportunities in the rural areas in order to increase livelihood, food and nutritional security, reduce the regional disparity and alleviate rural poverty in the country.

Under RKVY, many of the sectors such as crop development, horticulture, micro & minor irrigation, agriculture mechanization, natural resource management, organic farming & bio-fertilizers, extension (in the form of enterprise training), information technology, and other agriculture allied activities like livestock production and management, fisheries, marketing and post harvest management and sericulture have directly or indirectly helped in employment-

oriented, additional income generating opportunities at the village level across the country. Some of these activities contributed to bring about quantifiable changes in agricultural production and productivity in terms of educating the farmers, creating awareness and updating farmers about the emergence of new technologies in various fields.

Each sector as mentioned above created both farm and non-farm employment but in some cases like agricultural mechanization also introduced labour saving technology. However, in the case of agricultural mechanization, adoption of farm mechanization especially tractor may lead to increased operational land holdings and thereby results in creation of on-farm employment in terms of all agricultural operations. In addition, the demand for non-farm labour for manufacturing, services, distribution, repair and maintenance, as well as, other complementary jobs substantially increased due to mechanization. Furthermore, farm mechanization led to increase in inputs due to higher average cropping intensity, larger area, and increased productivity of farm labor. Undoubtedly, farm mechanization displaced animal power from 60 to 100 per cent but resulted in less time for farm work (Verma, 2008). In the case of RKVY there were some instances of increased employment due to intervention activities which are summarized below.

The activities like watershed and natural resource management lead to participatory, sustainable and equitable use of resources as well as enhance income and livelihood. These activities help in conversion of waste land into productive agricultural land through land development using means of conservation of water and soil health management. Organic farming and bio-fertilizers also create employment in terms of production and sale of organic manure, vermi-compost and other bio-fertilizers. Many SHGs and women farmers have taken-up these activities in a commercial manner whereby RKVY programme further contributed in the expansion of such activities. Adoption of these technologies, address the issues of environment and economic dimensions of agricultural sustainability in the long-run.

The extension activities like trainings were undertaken by cooperatives and cooperation sector covered under RKVY program. Training related to on-farm and off-farm activities like agriculture and allied enterprises, technology dissemination, information technology, integrated pests management (IPM), agribusiness, agro-processing etc., impart and encourage the rural youth to take-up these activities as self-employment and consultancy services by offering both training and financial assistance under different schemes.

The horticulture sector created some additional employment by means of increasing area under fruits, vegetables and floriculture as there were many projects on area expansion for crops such as oil palm, potato, saffron, rare and minor fruits, high value flowers, aromatic plants, aloe-vera, nutmeg, betel vine, pomegranate, grapes, citrus fruits, hybrid vegetables seed distribution, etc., under RKVY. In addition, the sub schemes and other state flagship projects and special programme like Oil Palm Area Expansion Programme (OPAE), Vegetable Initiative for Urban Clusters (VIUC), Saffron Mission, Nutritional Programme for Urban Areas, Integrated Vegetable Production Program in Tribal Area etc., also led to area expansion under these crops.

Just like horticulture, crop development sector also provided seeds and other inputs for expansion and enhancement of yield of various crops that possibly also created opportunities for additional employment. RKVY provided area expansion programs in crops such as paddy, inter

cropping in coconut gardens with tubers, lentil, maize etc. Additionally, there were many crop development programs on jute, sugarcane, oil seeds, and flagship programs in different states like Bringing Green Revolution in Eastern India (BGRE), promotion of System of Rice Intensification (SRI) etc., in different states.

In the case of sericulture, both state and Central governments are encouraging the farmers to take-up sericulture as a profession through promotion, development and strengthening of sericulture units/centers, construction of government grainages, rearing, transport facilities, improved production methods, expansion of mulberry gardens, up-gradation of government markets, training, and mechanization aspects in all silkworm types.

Micro and minor irrigation helps farming community in improving water efficiency and hence enables them to expand their farming activities with the limited water availability. Marketing and post-harvest management sector creates employment and increases farm returns in terms of accessibility, minimization of post-harvest losses, quality production and better farm prices. In marketing and post-harvest management, there is tremendous scope for the construction of godowns, pavement and auction platforms at market yards, setting up of wholesale and primary rural markets, hypermarkets, installation of modern mills, processing units, strengthening of regulated markets, agro processing units, promotion of storage bins, plastic crates etc., which directly and indirectly generate employment. In addition, many other agriculture and subsidiary activities such as dairying, livestock production and fisheries help in employment generation. Under RKVY programme there were some cases in which government provided support for establishing bulk milk cooling units, construction of fish ponds, seed and fodder production farms, mechanization of dairy farms, quality control labs etc., and also gave financial assistance to start-up such initiatives under infrastructure projects.

The results of the primary survey with respect to the region-wise additional annual employment generation per household in agriculture under RKVY are presented in Table 5.3. As discussed earlier, different sectors have contributed both directly and indirectly in generating the employment through RKVY. It is to be noted here that in the generation of additional employment, RKVY was one of the contributors and was not solely responsible for the same. The other resources like additional area of the farmers, other inputs used and management and entrepreneurial contribution of the farmers also contributed equally in the generation of additional mandays at the farmers end. Looking at the statistics presented in the table it is apparent that at the aggregate, all sector together created an average number of 11 days of additional employment per household constituting 6 days of own and 5 days of hired labour annually. Interestingly, the households' opinion about the increase in employment as a result of RKVY intervention, the selected beneficiaries indicated either no change or only 10 per cent increase in employment. One should see these results from the point that RKVY was not an employment generation progrmme and there exists many other programmes of both Central and state governments specifically for that purpose in the country. Some of the activities under RKVY were not at all related to employment generation such as seed distribution, crop protection programmes, R&D in agriculture and so on.

The regional picture of employment generation shows that south region generated highest number of 19 days of employment consisting of 9 days for family labour and 10 days for the higher labour through the activities of RKVY. In the east and north-eastern region, 11 days in of

employment with 5 days of own and 6 days of hired labour employment was generated. In the west and central region, 10 days with 5 days each for owned and hired labour days per household were generated. The least numbers of days of employment was generated in the north with average of 8 days consisting 4 days each for family and hired labour per household. The modal value of percentage increase as indicated by household opinion was less than 10 per cent in the south and west and central but no change in the east and north-east and north region.

The disparity in the numbers of mandays generation across states was mainly due to types of activities under taken in the state during the implementation of the RKVY programme and the nature of agricultural work performed manually or through mechanized methods. As noticed from the Annex Table 5.2A, among all the regions southern states generated higher numbers of days of employment compared to states in other regions. The top 6 states belonged to the south region alone, out of which Karnataka generated more than 27 days of employment (11 days own and 16 days hired) followed by Kerala 23 days (9 own and 14 hired), Goa 23 days (11 each from own and hired), Puducherry 19 days (7 own and 12 hired), Andaman Nicobar 17 days (9 own and 8 hired), Tamil Nadu 15 days, (8 own and 7 hired). Tripura in the east and north-east region occupies the next best position with 14 days, (7 days each of own and hired), followed by Gujarat and Maharashtra in the west and central region, and Mizoram in east and north east region 13 days, each. Madhya Pradesh, Bihar, Sikkim, West Bengal and Haryana states generated one day more than the aggregate average employment.

In majority of the states, the additional employment generated from hired sources were more than the own sources because of the reasons that the activities under RKVY have benefited more to the large farmers who are more scarce in family labour sources as compared to small and marginal farmers who are labour surplus. The landholders seem to be expanding their operations rather than new person entering into this profession. Few might have got into the subsidiary sectors like dairying, poultry, fishery and livestock rearing because of the special benefits provided under these sectors.

Table 5.3: State-wise annual employment generation under RKVY per household

| States/UTs | Employment generated (days/annum) | | | Modal Response | |
|---|---|---|---|---|---|
| | Own | Hired | Total | % increase in employment_ own | % increase in employment_ hired |
| South | 9 | 10 | 19 | < 10% | - |
| West and Central | 5 | 5 | 10 | < 10% | - |
| East and North-east | 5 | 6 | 11 | No Change | No Change |
| North | 4 | 4 | 8 | No Change | - |
| All India | **6** | **5** | **11** | No Change | - |

## 5.4 Agricultural Marketing details of RKVY Beneficiaries

Indian agriculture suffers a lot due to underdeveloped marketing system. In India, agricultural marketing comprises of poor infrastructure, poor transport and communication, limited rule of law, limited access to finance etc. This results into market failure. In the recent years there has been emphasis on market oriented liberalization to get 'prices and institutions right'. There is an

emergence of state run marketing boards, producer marketing chains ranging from credit unions through farmer cooperatives to wholesale cooperatives. Agricultural marketing policy in India has been characterized by State participation in marketing activities; State intervention in procurement and distribution of food grains; directing agricultural economy through regulatory mechanism such as licensing and control on movement, storage; creation of facilitating centres in the form of regulated markets; encouraging co-operative marketing; creation of supporting infrastructure like storage and warehousing; and construction of link roads, market information, marketing extension, etc.

Current agricultural marketing system in India is the outcome of several years of government interventions. The system has undergone several changes over the last 60 years owing to the increased marketed surplus; increase in urbanization and income levels and consequent changes in the pattern of demand for marketing services; increase in linkages with distant and overseas markets; and changes in the form and degree of government interventions. There is a need for the improvement in the marketing system especially in the light of Model APMC Act because the supply chain of agricultural products still remains fragmented with a large numbers of intermediaries. Moreover, multiple handling by different intermediaries results in huge wastages. The total mark up in the chain added up to 60-75 per cent. As a result the primary producers receive only 20-25 per cent of the consumer price.

In spite of the efforts and repeated persuasion by the Central Government through Ministry of Agriculture; reforms in agricultural marketing have not come up to a level of satisfaction, thereby affecting private investment in the sector for efficient marketing setup in the country. During the conference of State Ministers of Agriculture organized by the Department of Agriculture and Co-operation on 23rd April, 2008, a general consensus reached was that Ministry of Agriculture may constitute an Empowered Committee of State Ministers of Agricultural Marketing to guide the implementation of agricultural marketing reforms initiatives and for improving a framework for the APMC amendments and Market Reforms in agriculture. Accordingly, the Ministry of agriculture set up a Committee of State Ministers-in-charge Agricultural Marketing under the Chairmanship of Hon"ble Minister of Marketing and Cooperation, Government of Maharashtra on 2nd March, 2010 with members from the state of Orissa, Haryana, Gujarat, Uttrakhand, Madhya Pradesh, Andhra Pradesh, Assam, Karnataka, Bihar and Agricultural Marketing Adviser to the Government of India as a Member Secretary. One of the recommendations of the committee was investment in marketing infrastructure under RKVY be increased to minimum 10-15 per cent of State RKVY spending in reformed States. It was further stipulated that efforts be made to encourage certain minimum private investment in marketing infrastructure outside the APMCs as well. Accordingly, states have incurred some expenditure on developing agricultural marketing in the country in terms of construction of markets (both primary & wholesale), retail outlets and mobile vending units, warehouses, godowns, cold storages, pavements and auction platforms etc.; farmer market initiation supports, modernization of agriculture information wing, support agro processing units etc., in some agricultural sectors.

Farmers availed benefits under different sectors for the production of various agricultural commodities viz., their means of marketing are captured and summarised in tables below. Table 5.4 presents the results of overall agricultural marketing details at the aggregate whereas Annex Table 5.3A presents the region-wise agricultural marketing details. It is observed from Table 5.4

that there were interventions under RKVY in different sectors like crop development, micro/minor irrigation, horticulture, animal husbandry, agriculture mechanization, natural resources management (NRM), marketing and post-harvest management, fisheries, organic farming and bio-fertilizers, cooperatives and cooperation, sericulture and information technology (IT). The purpose of the benefit availed were directly related to production activities and the output was sold through different marketing channels such as village market, APMC mandis, private and other channels through different sources like commission agents, government agencies and other private traders/wholesalers etc. These marketing channels generally did not receive any direct benefits under RKVY.

It is revealed by the statistics in the table that the average turnover by RKVY beneficiaries in different marketing channels at the aggregate of all the sectors was Rs 95 thousand per household. It is to be pointed out here that out of the farmers total produce only that part we accounted here for which some intervention in the form of seed, fertilizer, pesticide, irrigation, mechanization or any other advantage was availed by the farmers under RKVY. A majority of the farmers produce for which RKVY intervention was availed was sold through village markets 37 per cent of the total produce sold followed by private and other channels around 35 per cent and APMC mandis shared only 26 per cent of the produce sold by the beneficiaries. This shows the prevalence of India's long tradition of periodic markets, most of which are held in rural areas. Most of the small and medium farmers market their farm produce and purchase inputs also from these markets. The prominence of private and other channels exploit farmers in many forms and reap the maximum share of consumer rupee. The same trend was noticed across the sectors also. The highest share of 69 per cent of the output was marketed through dominant intermediaries like private traders, followed by commission agents 18 per cent and government agencies only 12 per cent. The private traders usually act like wholesalers without holding license they buy from the farmers and sell to the retailers directly. The commission agents facilitate the sales transactions through different auction methods and charge commission from both buyers and sellers. The participation of commission agents in sericulture was only 4.4 per cent wherein government held up to 44 per cent share. The role of government was limited to specific commodities in the country. Some of these government agencies were from cooperative marketing societies.

Table 5.4: Agricultural Marketing details of RKVY beneficiaries_ All India

| Regions | Avg. amount of sale (Rs per hh) | % of beneficiaries marketing channels | | | % of beneficiaries selling through different agents | | | Average distance covered for the sale |
|---|---|---|---|---|---|---|---|---|
| | | Village market | APMC Mandi | Private and others | Commission agent | Govt. Agency | Private traders and other | |
| South | 99188 | 36.97 | 24.28 | 33.07 | 27.95 | 10.90 | 60.45 | 12.39 |
| Central | 80752 | 30.59 | 38.20 | 28.96 | 26.06 | 14.98 | 56.44 | 12.48 |
| East | 55734 | 54.84 | 8.05 | 34.47 | 0.50 | 4.28 | 92.45 | 6.02 |
| North | 152008 | 35.60 | 16.78 | 47.30 | 3.43 | 17.04 | 79.21 | 9.84 |
| All India | 95367 | 36.83 | 23.86 | 35.06 | 17.58 | 12.40 | 68.55 | 10.79 |

## 5.5 Constraints Faced under RKVY

Incomplete and lack of information about their rights and complex procedures involved to access the same are possible reasons why poor people do not fully access the public services due to them, as has been often observed in developing countries (World Bank, 2004). Any program for that matter will be having its own operational constraints during the implementation. To understand the complexities involved in RKVY programme and the constraints being faced by the farmers in accessing the programme, we designed our questionnaire with a series of qualitative and quantitative questions about the farmers' views and opinion about the programme and the difficulties faced by them in the implementation of intervention at their farm level. A list of questions were prepared to understand the transaction costs incurred, comprising of cost involved in gathering the information regarding the program, cost in preparing and submitting the documents, bribe paid to get access to the programme and difficulties faced in availing the benefits under RKVY.

To avail the benefit under RKVY, the beneficiaries incurred some transaction costs. One of the items of transaction cost was bribe paid by the farmers to have access to the benefit. Most of the farmers were hesitant to reveal this kind of information and many put condition of anonymity in expressing the same. However, details of those who paid cash and revealed the information about the amount paid as bribe for availing the benefit at various levels of service delivery across different states are recorded in Table 5.5. It is noticed from the table that about 7.5 per cent of the beneficiaries/respondents at the aggregate paid an average amount of bribe of Rs 6711 per beneficiary household to avail the benefits under RKVY. However, among different regions, the highest 15 per cent respondents paid bribe in the north region followed by west and central region around 8 per cent, east and north east region around 5 per cent and south only less than 1 per cent households paid bribe as per the responses recorded from the households. Similarly, among different states, Jharkhand was the top state where highest percentage of respondents paid bribe around 48 per cent, followed by Uttar Pradesh 36 per cent and Madhya Pradesh 16 per cent. In all other states less than 12 per cent respondents paid bribe.

However, the amount paid as bribe presents a different picture. Some states where high amount of bribe was paid, the numbers of households who paid was only few while in other cases the amount as well as the numbers of households both was large. For example, the highest amount of cash bribe was found in Tamil Nadu wherein the amount paid was to the extent of Rs 1.5 lakh to avail intervention benefits under RKVY but the numbers of households who paid was only one. Similarly, in Haryana an amount of Rs 25 thousand was paid as bribe but the percentage of households who paid bribe was 1.2 per cent of the respondents. In Madhya Pradesh around Rs. 18 thousand was paid as bribe by around 16 per cent of the respondents, in West Bengal, Rs 15 thousand was paid by around 10 per cent of the respondents, in Jammu Kashmir Rs 13 thousand was paid by around 5.2 per cent of the respondents. The average amount was around or less than Rs 10 thousand in rest of the states where cases of bribery were observed.

Other constraints as expressed by the respondents while availing the benefits under RKVY are summarized in Table 5.6. Awareness remains the necessary condition for farmers' access to the development programmes whatsoever. In the case of RKVY, households' lack of awareness about the programme was the biggest constraint and the same was also observed by our field team as even though households availed subsidy benefits but they were not aware that the

subsidy was given to them under the RKVY programme. Among the other constraints, highest percentage of beneficiaries (38 per cent) quoted that Information about RKVY programme details were not available. Around, 36 per cent quoted that capacity building/technical advice was not provided, around 30 percent opined that contacts details of the department which pay subsidy were not available, another 25 to 30 per cent of the beneficiaries pointed out that procedure for subsidy was very tedious; numbers of documents required for availing subsidy were too many; there was long time-gap between the purchase and receiving the subsidy amount; and subsidy was paid only after the purchase whereas the initial payment remained the highest problem for buying the instrument or investing in the assets as other major important constraints.

Table 5.5: Opinion of beneficiaries about incidence of bribery under RKVY

| State | % of Beneficiaries | Average Amount Paid |
|---|---|---|
| A & N Islands | 0.67 | 14500 |
| Kerala | 0.80 | 1940 |
| Tamil Nadu | 0.33 | 150000 |
| **South Region** | **0.27** | **42095** |
| Chhattisgarh | 5.20 | 500 |
| Gujarat | 3.55 | 1289 |
| Madhya Pradesh | 15.80 | 17962 |
| Maharashtra | 11.14 | 4167 |
| **West & Central Region** | **7.77** | **11009** |
| Assam | 1.44 | 10167 |
| Jharkhand | 47.60 | 10663 |
| Manipur | 0.86 | 1000 |
| West Bengal | 10.00 | 15200 |
| **East & North-East Region** | **5.35** | **11080** |
| Haryana | 1.20 | 25000 |
| Jammu and Kashmir | 5.20 | 13000 |
| Uttar Pradesh | 35.88 | 7041 |
| Uttrakhand | 5.20 | 1000 |
| **North Region** | **15.41** | **7208** |
| **All India** | **7.52** | **6711** |

Across various regions, the order of constraints as mentioned above varied widely. In the south region, beneficiaries felt that capacity building/technical advice not provided was one of the major reasons as the same was expressed by 66 per cent of the beneficiaries. It was noticed that many of these beneficiaries made huge investments like establishment of green houses, purchase of high cost-machineries etc., but they failed in utilizing these implements effectively and efficiently in the initial years because of lack of capacity building or technical advice and thereby they learnt by trial and error methods. The same constraint was indicated by 40 per cent beneficiary households in the north region and 27 per cent in the east and north east region.

In the case of west and central, and east and north-east regions beneficiaries expressed more or less similar difficulties and operational problems wherein more than 20 to 35 per cent of the farmers cited information about RKVY programme details not easily available, contact details of

the department which pay subsidy not available, eligibility or criteria for availing the subsidy not known, procedure for the subsidy very tedious, number of documents required for availing subsidy were too many, capacity building/technical advice not provided as the important constraints. The proportion of beneficiaries who participated in expressing the constraints were less in these regions compared to south and north.

In addition to the information about RKVY programme details not available as the major constraint for 58 percent of the beneficiaries in the north region, more than 48 per cent of the beneficiaries orated that contact details of the department which pay subsidy not available, and long time-gap between the purchase and receiving the subsidy amount as the important constraints in that region. In comparison to all the other regions, higher proportion of beneficiaries in the north region excerpted their consent towards other constraints listed in Table 5.6.

Table 5.6: Constraints faced in availing RKVY benefit

| Sl No. | Constraints | Regions | | | | Aggre-gate |
|---|---|---|---|---|---|---|
| | | South | West & Central | East & North East | North | |
| 1 | Information about RKVY programme details not easily available | 33.74 | 33.67 | 27.27 | 58.00 | 37.61 |
| 2 | Contact details of the department which pay subsidy not available | 17.18 | 31.49 | 22.78 | 48.83 | 30.32 |
| 3 | Eligibility or criteria for availing the subsidy not known | 23.27 | 27.82 | 22.75 | 35.71 | 27.26 |
| 4 | Procedure for the subsidy very tedious | 20.05 | 29.26 | 22.75 | 42.63 | 28.75 |
| 5 | No of documents required for availing subsidy are too many | 14.78 | 30.27 | 20.70 | 47.17 | 28.48 |
| 6 | Subsidy paid after purchase while initial payment remains the highest problem | 28.88 | 19.15 | 13.98 | 38.39 | 23.95 |
| 7 | Prescribed machinery/asset not easily available in the market | 24.09 | 10.21 | 9.70 | 14.63 | 13.63 |
| 8 | Institutional financing facility not available | 47.64 | 12.39 | 16.78 | 26.78 | 23.79 |
| 9 | Capacity building/technical advice not provided | 66.19 | 19.73 | 27.42 | 40.44 | 35.85 |
| 10 | Long time gap between the purchase and receiving the subsidy amount | 22.59 | 23.09 | 17.82 | 48.68 | 27.62 |
| 11 | Biased towards large land owners | 18.28 | 5.53 | 7.69 | 17.66 | 11.59 |
| 12 | Poor quality of materials/machinery are supplied | 20.53 | 5.05 | 10.20 | 21.56 | 13.71 |
| 13 | Implementing agencies are located far away | 20.81 | 11.22 | 10.38 | 20.39 | 14.95 |
| 14 | Any other _specify | 0.07 | 1.76 | 1.01 | 1.37 | 1.10 |

## 5.6 Sources of Funds

As discussed earlier, some of the programmes were beneficiary oriented whereas others were institutional programmes. Under the beneficiary oriented programmes, goods and services were provided at the subsidized rates. In other words, different departments provided subsidies in varying amounts to beneficiary farmers under the RKVY programme. The beneficiary farmers shared roughly half of the total cost of machinery and equipments, milch animals, etc., and the rest was met by the implementing agencies. In most of the states, small garden implements like

spade, sickles, water cans, shovels were given free of cost, i.e., without beneficiary contribution. We also found a few cases wherein equipments like knapsack sprayers, compression sprayers in Nagaland, electric motor pump as well as power tillers in West Bengal were provided free of costs to a few beneficiaries.

The average investment made by the beneficiary farmers to purchase the assets at the aggregate was Rs 30.6 thousand which ranged from Rs 11.7 thousand in the east and north-east region and Rs 43 thousand per beneficiary in the north region (Table 5.7). Among the beneficiary farmers, a few purchased high cost machinery like combine harvesters, threshers, tractors, power tillers, seed drills whereas others invested in milch animals and establishing milk Dairies. In many cases average amount of investment as discussed in this and previous two chapters was inflated by large investments by a small number of beneficiaries. It was observed that the beneficiary households mobilized more than 50 per cent of the funds from non-institutional sources like money lenders, friends and relatives etc., and around one fifth from the institutional sources such as commercial banks and cooperatives and rest of 22 per cent were contributed from their own funds. The average amount of contribution per beneficiary farmer, as well as, the quantum of amount mobilized from different sources also varied across the regions.

On average, beneficiaries from the north region which includes states like Punjab, Haryana and Uttar Pradesh among others invested around Rs 43 thousand to purchase subsidized assets made available under various RKVY programmes implemented by different departments like agriculture, horticulture, animal husbandry, etc. Major part of the investment was for farm machinery and equipments and for purchasing milch animals. The beneficiary farmers mobilized 18.6 per cent of the total investment through institutional sources, 52.6 per cent from non-institutional sources and rest roughly 29 per cent of the investment was met from own savings. The west and central region ranked second in terms of average amount invested to acquire subsidized assets under RKVY programme. The average amount invested was around Rs 40 thousand per beneficiary household. The average amount of investment was influenced by purchase of farm machinery and equipments like tractors, seed drills, water pumps, etc. The total investment consisted of 22.3 per cent of own funds, 20.2 per cent as loans from the institutional sources and rest 57.5 per cent of the total invested amount was mobilized through borrowings from non-institutional sources.

Table 5.7: Source of investment borne by the households for the RKVY intervention

| Sl No | Region | Average amount of beneficiary investment (Rs per household) | % Contribution by source | | |
|---|---|---|---|---|---|
| | | | Own funds | Institutional borrowings | Non-institutional borrowings |
| 1 | South | 37160 | 19.2 | 29.7 | 51.1 |
| 2 | West and Central | 39842 | 22.3 | 20.2 | 57.5 |
| 3 | East and North East | 11725 | 14.8 | 13.5 | 71.7 |
| 4 | North | 43215 | 28.8 | 18.6 | 52.6 |
| All India | | 30636 | 22.3 | 20.5 | 57.2 |

In the south region, average investment was Rs 37 thousand per beneficiary. The beneficiaries from south region also invested mainly in farm machinery and equipments such as power tillers, combine harvesters, betel nut cutter, etc. Total investment included own funds, loans from

institutional sources and borrowing from the non-institutional sources and shared 19.2 per cent, 29.7 per cent and 51.1 per cent of the total investment, respectively. The beneficiaries of RKVY programme from the east and north-east region spent least amount for acquiring assets. The average investment was Rs 11.7 thousand per beneficiary household. The investment was made for purchase of power tillers, threshers, sprayers, pump sets, small farm equipments and so on. The investment was made by using about 15 per cent of own funds, 13.5 per cent of borrowings from institutional sources like banks and cooperatives and rest 72 per cent was mobilized through borrowings from non-institutional sources such as friends and relatives and private money lenders. It is interesting to note that the share of non-institutional borrowing to support investment was highest in the east and north-east region, whereas it was least in the south region. The beneficiaries from south region had mobilized (borrowed) the highest proportion, 29.7 per cent of their investment.

Regional averages provide broad indication about the mobilization of funds to acquire subsidized assets under RKVY program. Nevertheless, we find large variations across states within the regions in terms of beneficiary contribution as well as sources of funds to finance the purchase of farm machinery and equipments, livestock and implements of other farm or crop development activities. The average amount of beneficiary contribution ranged between Rs 13.6 thousand in Kerala and Rs 1 lakh per beneficiary in Puducherry, as against Rs. 37 thousand per beneficiary household in the region as a whole (Table 5.6A). Most of the beneficiaries in south region invested in farm machinery and equipments, cultivation of horticultural crops and a few in livestock. The beneficiary households mobilized funds from different sources to avail benefit of RKVY subsidy. Own funds contribution was 19.2 per cent of the total investment made by beneficiaries from south region and it ranged from 7.3 per cent in Andaman Nicobar to 63.1 per cent in Kerala. Incidentally, average investment per beneficiary household was the least among the states grouped under south region. Loans raised from banks and cooperatives (institutional sources) shared as low as 9.8 per cent of the investment in Andhra Pradesh when compared with 42.8 per cent of the investment in Andaman Nicobar. Non-institutional borrowings raised to support beneficiary contribution ranged between 13.8 per cent in Kerala and 66.6 per cent of the total investment in Puducherry.

The average investment made by the beneficiaries varied from Rs 14 thousand in Chhattisgarh to Rs 1.1 lakh per beneficiary household in Rajasthan in the west and central region (Table 5.6A). It was noticed that many beneficiaries from Chhattisgarh got farm implements and machineries such as tillers, cutters and pump sets, etc., without contributing any margin money i.e., these were fully subsidised items distributed among few beneficiaries and hence, the average amount contributed to avail subsidy was lowest in Chhattisgarh among the states in west and central region. In Gujarat and Maharashtra, most of the beneficiaries invested in cultivators, rotavators and tractors whereas in Madhya Pradesh pump sets and sprayers dominated the assets purchased under RKVY programme. In Rajasthan, average investment per beneficiary was Rs 1.1 lakh and was the highest among the states in that region. The average amount of investment / contribution made by beneficiary households was influenced by the extreme values as 18 beneficiaries spent around Rs. 2.51 lakh each for solar system. In addition to this, contribution to buy livestock and farm machinery also added to inflate the average amount of investment per beneficiary in Rajasthan. It is interesting to note that all the investment made by beneficiaries in Rajasthan was through loans of which 15 per cent was from institutional sources and rest 85 per cent from non-institutional sources. Institutions borrowings ranged from 9.3 per cent in Madhya Pradesh to 31

per cent of the total investment in Gujarat. RKVY beneficiaries from Gujarat used 69 per cent of the funds from their own savings. Maximum amount was mobilized from non-institutional sources in Rajasthan 85 per cent followed by Maharashtra 63.2 per cent, Madhya Pradesh 47.6 per cent and Chhattisgarh 35.3 per cent.

The average investment made by beneficiary households in the east and north-east region ranged from negligible amount of Rs 260 in Meghalaya to a maximum amount of Rs 33 thousand per beneficiary in Orissa with an overall average of Rs 11.7 thousand per beneficiary for the region as a whole. RKVY beneficiaries in Assam, Bihar, Jharkhand, Orissa and Tripura invested more than Rs 10 thousand per household. Nagaland state distributed mostly small farm implements like spade, pick axe, garden rake, shovel, sickles free of cost without beneficiary contribution. Seed for horticultural crops like ginger and potatoes and field crops like maize and mustered were provided free under crop improvement programmes. In Meghalaya and Manipur, most of the RKVY beneficiaries benefited through distribution of vegetable seeds by the department of horticulture and under the crop improvement programme. Most of the beneficiaries received vegetable seeds free of cost and a few paid small amount as their contribution.

In other states viz., Assam, Bihar, Jharkhand, Orissa, and Tripura in the east and north-east region where average investment by beneficiary farmers was more than Rs 10 thousand mostly invested in buying power tillers, rotavators and diesel pumps sets. A few beneficiaries from Bihar purchased mini trucks as well. The average investment per beneficiary was modest in West Bengal, slightly above Rs 4 thousand as some beneficiaries obtained farm equipments and machinery like power tillers, pump sets or crushers free of cost without any beneficiary contribution. Some beneficiaries raised loans from banks and cooperatives, e.g., beneficiaries from Jharkhand mobilized 65.7 per cent, followed by 15.1 per cent in Sikkim and 10.2 per cent in Orissa. Loans taken from informal sources to avail benefit under RKVY subsidies ranged from 18.9 per cent in Jharkhand to 100 per cent of the total investment by beneficiary in Arunachal Pradesh.

In the north region, total investment ranged from Rs 11 thousand per beneficiary in Uttarakhand to Rs 1 lakh in Punjab with an average of Rs 43 thousand per RKVY beneficiary for all the six states in the north taken together. In Punjab, most of the households benefited from animal husbandry component of the RKVY programme. The average investment on purchase of milch animals, construction and renovation of cattle shed and milking and other machinery and equipments was Rs 98 thousand per beneficiary household in Punjab. About 19 beneficiaries invested between Rs. 5 lakh and Rs 18.5 lakh per household on purchasing livestock in the state. Similarly, in Jammu and Kashmir, where average investment per beneficiary household was Rs 65 thousand, more than half of the investment was made for purchasing farm machinery and equipments such as tractors, power sprayers and pump sets, followed by investment in micro/minor irrigation, natural resource management, organic farming and development of bio-fertilizer, etc. Activities or components under horticulture, animal husbandry and fisheries were highly subsidized ranging between 66 per cent and 99 per cent in Jammu and Kashmir and hence the investment or contribution of the beneficiaries was quite low in these programmes. In the case of Haryana, investment on livestock and related assets was Rs 26 thousand per beneficiary and for purchasing farm implements and machinery Rs 30 thousand per beneficiary. Most of the beneficiaries opted for laser land leveler, straw reaper and rotavator.

Table 5.7A: Source of investment borne by the households in different states

| Sl. No. | Region | Average amount of beneficiary investment (Rs.) | % Contribution by Source | | |
|---|---|---|---|---|---|
| | | | Own Funds | Institutional Borrowings | Non-institutional Borrowings |
| 1 | Andhra Pradesh | 33,085 | 19.2 | 9.8 | 71.0 |
| 2 | Goa | 26,905 | 17.5 | 37.2 | 45.3 |
| 3 | Karnataka | 37,826 | 25.2 | 31.0 | 43.8 |
| 4 | Kerala | 13,651 | 63.1 | 23.1 | 13.8 |
| 5 | Tamil Nadu | 49,801 | 16.9 | 39.4 | 43.7 |
| 6 | Puducherry | 1,03,970 | 7.8 | 25.6 | 66.6 |
| 7 | A & N Island | 18,762 | 7.3 | 42.8 | 49.9 |
| **South Total** | | **37,160** | **19.2** | **29.7** | **51.1** |
| 1 | Chhatisgarh | 14,134 | 47.4 | 17.3 | 35.3 |
| 2 | Gujarat | 17,798 | 69.0 | 31.0 | 0.0 |
| 3 | Madhya Pradesh | 33,388 | 43.1 | 9.3 | 47.6 |
| 4 | Maharashtra | 19,000 | 24.6 | 12.2 | 63.2 |
| 5 | Rajasthan | 1,13,170 | 0.0 | 15.0 | 85 |
| **West and Central total** | | **39,842** | **22.3** | **20.2** | **57.5** |
| 1 | Arunachal Pradesh | 1,931 | 0.0 | 0.0 | 100 |
| 2 | Assam | 12,954 | 9.5 | 0.0 | 90.5 |
| 3 | Bihar | 17,481 | 0.0 | 0.0 | 100 |
| 4 | Jharkhand | 24,690 | 15.4 | 65.7 | 18.9 |
| 5 | Manipur | 983 | 0.5 | 0.0 | 99.5 |
| 6 | Meghalaya | 258 | 4.9 | 0.0 | 95.1 |
| 7 | Mizoram | 5,014 | 30.0 | 0.0 | 70 |
| 8 | Nagaland | - | 0.0 | 0.0 | 100 |
| 9 | Orissa | 33,204 | 17.1 | 10.2 | 72.7 |
| 10 | Sikkim | 6,632 | 28.1 | 15.1 | 56.8 |
| 11 | Tripura | 12,385 | 16.3 | 0.0 | 83.7 |
| 12 | West Bengal | 4,713 | 0.0 | 0.0 | 100 |
| **East and North East Total** | | **11, 725** | **14.8** | **13.5** | **71.7** |
| 1 | Haryana | 59,369 | 44.5 | 25.4 | 30.1 |
| 2 | Himachal Pradesh | 29,158 | 34.1 | 11.8 | 54.1 |
| 3 | Jammu and Kashmir | 64,750 | 37.0 | 16.1 | 46.9 |
| 4 | Punjab | 1,05,093 | 14.5 | 32.1 | 53.4 |
| 5 | Uttar Pradesh | 26,583 | 26.7 | 7.1 | 66.2 |
| 6 | Uttarakhand | 10,931 | 37.8 | 12.6 | 49.6 |
| **North Total** | | **43,215** | **28.8** | **18.6** | **52.6** |
| **All India** | | **30,636** | **22.3** | **20.5** | **57.2** |

Farmers' own contribution varied from 14.5 per in Punjab to 44.5 per cent of the total investment in Haryana. The beneficiaries borrowed from both institutional and non-institutional sources to finance their investment. The loans from institutional sources shared 18.6 per cent of the total investment in the north region. The loans from institutional sources such as banks and cooperatives ranged from 7.1 per cent in Uttar Pradesh to 25.4 per cent in Haryana. The loans taken from non-institutional sources such as friends & relatives and moneylenders accounted for 52.6 per cent of the investment and it varied from 30.1 per cent in Haryana to 66.2 per cent of the total investment per beneficiary in Uttar Pradesh.

## 5.7 Views and Opinion of the Beneficiaries about RKVY

Opinion of the beneficiary households were elicited about the usefulness of RKVY programme and its impact in terms of capacity building, improvement in infrastructure facilities, financial assistance to adopt improved technology, diversification of farm activities or facilitating adoption of subsidiary activities to improve household income, etc. The survey results are presented in Table 5.8. It can be seen from the statistics in the table that more than two third of the beneficiaries reported that provision of subsidies facilitated investment in acquiring farm machinery and equipments, livestock, development of infrastructure, adoption of and diversification of agriculture which otherwise would have been difficult. Provision of subsidy as the best component was elicited by 39 per cent of the beneficiary households in the east and north-east region while more than 80 per cent households in rest of the three regions indicated it as the best component of RKVY programme.

Table 5.8: Opinion of beneficiary households about RKVY programme

| Sl. No. | Region | Benefits of RKVY Programme (% of Beneficiaries) | | | | |
|---|---|---|---|---|---|---|
| | | Financial Assistance | Building Infrastructure | Capacity Building | Provision of Subsidy | Others |
| 1 | South | 62.6 | 11.0 | 28.8 | 83.0 | 0.9 |
| 2 | West and Central | 60.1 | 14.7 | 11.1 | 84.6 | 6.2 |
| 3 | East and North East | 16.3 | 7.0 | 3.5 | 39.4 | 1.3 |
| 4 | North | 40.2 | 8.8 | 4.8 | 82.4 | 13.5 |
| 5 | All India | 40.6 | 10.0 | 10.1 | 68.4 | 5.4 |

About 41 per cent beneficiary households viewed RKVY programme beneficial as it provided financial assistance. The proportion of beneficiaries endorsing this view varied from 16 per cent in the east and north-east region to 63 per cent beneficiary households in the south region. At the aggregate 10 per cent of the beneficiary households opined that RKVY schemes/programmes facilitated in building infrastructure facilities and the opinion on this aspect varied from 7 per cent of the beneficiaries in the east and north-east region to nearly 15 per cent beneficiaries in the west and central region. Similar to infrastructure building around same percentage of households at the aggregated opined that RKVY helped in capacity building. The proportion of beneficiaries sharing capacity building varied from 3.5 per cent beneficiaries in the east and north-east to nearly 29 per cent of the beneficiaries in the south region. Little more than 5 per cent of the beneficiary households viewed RKVY programme beneficial to them in other matters.

## 5.8 Suggestions for the Better Implementation of RKVY Programme

We sought suggestions from the beneficiary households for improving the usefulness of RKVY programme in terms of better output and outcome. In the process we received 4522 responses during the survey. There were numerous suggestions, which we tried to group into 10 broad categories which are described as below:

1. Capacity building: conducting training programs for capacity building should be focused on one specific topic instead of covering a plethora of subjects in a single training programme.

2. Subsidy related: timely availability, simple procedure of availing subsidy, enhancing the coverage and hike the percentage of subsidy given.
3. Production and input related: timely provision of good quality seeds, availability of appropriate and required fertilizers, pesticides and other inputs.
4. Integration of schemes and wider coverage of schemes: integrating MGNREGA with crop production, crop insurance and credit, post-harvest facilities (cold storage and procurement), animal husbandry and dairy (better breeds, collection centres, chilling plants, etc).
5. Irrigation related: provision of pump sets, construction of tanks and ponds, availability of electricity/diesel for operating pump sets, flood control measures in chronically flood affected areas.
6. Farm mechanization: availability of farm machineries and equipments to deal with labour problems and ensure timely farm operations.
7. Access to credit: simpler documentation and bank procedures to avail loans.
8. Market facilitation: price information, identifying market and provision of transportation.
9. Feed supplements: provision of feed supplements like protein supplements, mineral bricks and good quality cattle feeds, etc., at subsidized rates.
10. General suggestions – weather related information, fencing around farm land to prevent entry of wild animals, information on animal diseases, mobile veterinary clinics under RKVY schemes, provision of medicines, continuation of RKVY, organic manure, better infrastructure facilities, soil testing facility, etc.

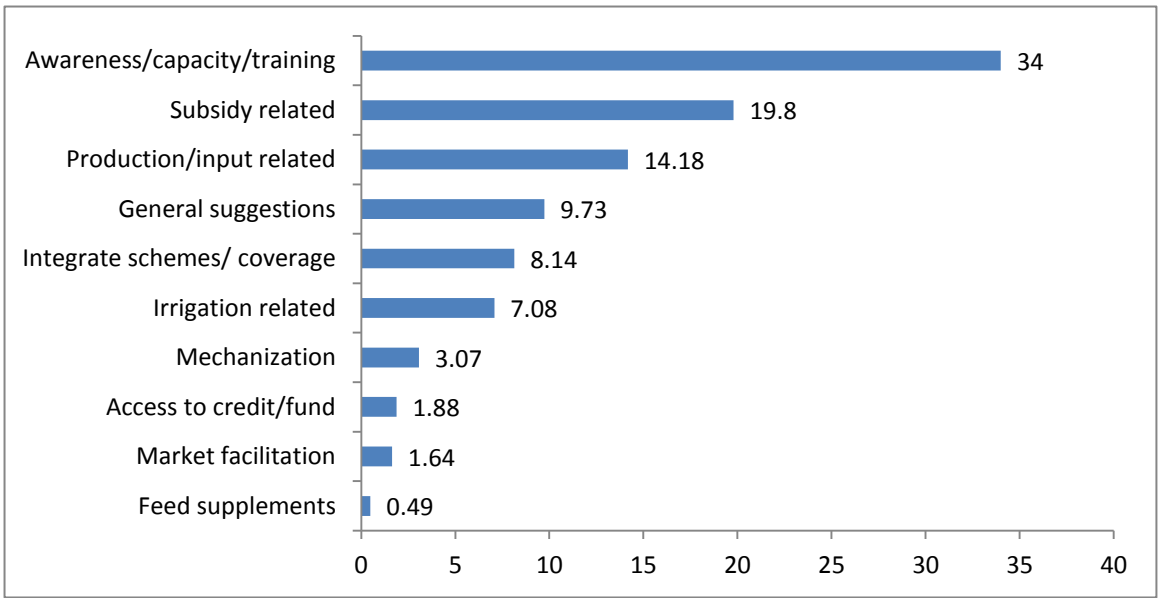


Figure 5.1: Suggestions of beneficiaries on RKVY programme

The responses varied from 0.5 per cent beneficiaries suggesting supply of quality feed supplement for livestock to 34 per cent of the beneficiary suggesting improvements in capacity building (Figure 5.1). About 34 per cent of the beneficiary households suggested well formulated training programmes, focused on a single aspect or theme like plant protection, preparation of vermi-compost, improved cultural practices, etc. would be more effective.

Similarly, nearly 20 per cent of the beneficiaries suggested timely availability of subsidy as well as less documentation to avail the subsidy offered under different components of RKVY. This was followed by suggestions related to production and input (14.18 per cent), general suggestions regarding fencing of farms near forest areas, transmission of weather data to the farmers, mobile veterinary clinics, etc., (9.73 per cent). A little more than 8 per cent of the beneficiaries demanded integration of schemes and wider coverage and scope of the schemes like integrating MGNREGA with crop production, crop insurance and credit, post-harvest facilities (cold storage and procurement), animal husbandry and dairy (better breeds, collection of milk centers, chilling plants, etc). About 7 per cent of the beneficiary households emphasized development of irrigation infrastructure through provision of pump sets, construction of tanks and ponds, availability of electricity/diesel for operating pump sets, flood control measures in chronically flood affected areas. There were few suggestions related to mechanization, access to credit, market facilitation and supply of feed and fodder for dairy animals.

## 5.9 Benefits Availed by RKVY Beneficiaries from Other Government Schemes

In addition to RKVY programmes, there are other Central and Centrally sponsored Schemes (CCS) as well as state schemes / programmes being implemented simultaneously by the state department of agriculture and line departments. Most of these schemes also has inbuilt element of subsidy. The major schemes/programmes implemented under CCS in most of the states include NHM, Agricultural Mechanization, NFSM, ISOPOM, Watershed Development, etc., and a few state sponsored programmes like Livestock and Dairy Development, Fisheries, Minor and Micro Irrigation, Distribution of Certified / HYV Seeds, etc. During our field survey, in addition to collecting information related to RKVY programme, we also collected information on subsidy obtained by our beneficiary households from the other programmes in order to see the volume of subsidy obtained from RKVY vis-à-vis other Central or State sponsored programmes.

It can be seen from Table 5.9 that numbers of RKVY beneficiaries availing subsidies from other schemes and programmes varied from 0.07 per cent of the RKVY beneficiaries receiving subsidy from watershed programmes as against 5.13 per cent of the households benefited from other programmes. The amount of subsidy from other programmes per household availing benefits ranged from Rs 788 from ISOPOM to Rs 31.7 thousand from other programmes. About 1.16 per cent of the RKVY beneficiary households from south region received subsidies from NHM program. The average amount of subsidy for the households availing NHM programme was Rs 21.4 thousand per beneficiary. Roughly, 2 per cent beneficiaries availed subsidy under agricultural mechanization and each beneficiary received Rs 23.7 thousand subsidy per household. State sponsored programmes like APMIP, PMRP in Andhra Pradesh, Kamdhenu in Goa, or KMIP in Karnataka are grouped under other programmes. Little more than 5 per cent of the RKVY beneficiary households of RKVY programme benefited from other state sponsored or CCS programmes and on average received Rs 31.7 thousand per household subsidy. The average subsidy per beneficiary was the highest for other programmes as large number of households from Andhra Pradesh received subsidy ranging from Rs 50 thousand to Rs 90 thousand per household. A total of 9.3 per cent of the 1461 RKVY beneficiaries surveyed in the south region, benefited from other CCS and state government schemes. The average amount of subsidy per household availing the benefits of other schemes was Rs 24 thousand per household.

Table 5.9: Benefits availed from other government schemes by RKVY beneficiaries

| Sl. No. | Scheme | % of beneficiaries benefitted | Average subsidy amount per beneficiary in Rs |
|---|---|---|---|
| **South Region** | | | |
| 1 | National Horticulture Mission(NHM) | 1.16 | 21,368 |
| 2 | Mechanization in agriculture(MA) | 1.98 | 23,744 |
| 3 | National Food Security Mission(NFSM) | 0.34 | 8,200 |
| 4 | Integrated Scheme of Oilseeds, Pulses, Oil Palm and Maize (ISOPOM) | 0.14 | 788 |
| 5 | Watershed programme | 0.07 | 10,500 |
| 6 | Animal Husbandry & Dairying | 0.48 | 3,086 |
| 7 | Others | 5.13 | 31,730 |
| **Total** | | **9.30** | **24,435** |
| **West and Central Region** | | | |
| 1 | National Horticulture Mission(NHM) | 5.8 | 34,437 |
| 2 | Mechanization in agriculture(MA) | 3.14 | 17,073 |
| 3 | National Food Security Mission(NFSM) | 1.98 | 7,949 |
| 4 | Integrated Scheme of Oilseeds, Pulses, Oil Palm and Maize (ISOPOM) | 0.96 | 975 |
| 5 | Watershed programme | 0.11 | 4,700 |
| 6 | Animal Husbandry & Dairying | 0.53 | 26,375 |
| 7 | Others | 4.04 | 55,982 |
| **Total** | | **16.56** | **31,142** |
| **East and North Eastern Region** | | | |
| 1 | National Horticulture Mission(NHM) | 1.19 | 21,759 |
| 2 | Mechanization in agriculture(MA) | 0.36 | 37,960 |
| 3 | Watershed programme | 0.11 | 9,633 |
| 4 | Others | 3.19 | 12,914 |
| **Total** | | **4.85** | **16,858** |
| **North Region** | | | |
| 1 | National Horticulture Mission(NHM) | 3.27 | 30,265 |
| 2 | Mechanization in agriculture(MA) | 1.22 | 15,681 |
| 3 | Watershed programme | 0.10 | 91,400 |
| 4 | Animal Husbandry & Dairying | 0.10 | 4,433 |
| 5 | Others | 4.93 | 4,055 |
| **Total** | | **9.62** | **15,335** |
| **ALL INDIA** | | **9.53** | **23,713** |

In the west and central region, percentage of the total 1880 RKVY beneficiaries availing subsidies from other programmes ranged from 0.11 per cent from watershed programmes to 5.8 per cent from NHM. The average subsidy availed per household ranged from a minimum of Rs 975 from ISOPOM to the maximum of Rs 56 thousand in the case of other programmes. The average subsidy per beneficiary was the highest from other programmes as the large number of beneficiaries of JNNSM from Rajasthan received subsidy raging from Rs 49 thousand to Rs 1.7 lakh. The subsidy averaged at Rs 34 thousand per household from NHM followed by Rs 26 thousand from animal husbandry and dairy programmes and Rs 17 thousand from agriculture mechanization programmes. A total of 16.6 per cent of the RKVY beneficiaries availed benefits from other schemes in the west and central region.

About 5 per cent of the 2783 RKVY beneficiary households from east and north-east region availed benefit of other CCS and state sponsored programmes. The proportion of beneficiary households availing benefits of other than RKYV programmes in east and north-east region was the lowest as 6 north-east states, namely Arunachal Pradesh, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura have not reported any benefits from other scheme / programme. Among different programmes, 0.11 per cent beneficiaries availed subsidy under watershed programmes, 3.19 per cent benefitted from other CCS and state programmes, 1.2 per cent from NHM programme and 0.4 per cent were benefitted from agricultural mechanization. Average subsidy ranged from Rs 9.6 thousand per household under watershed progammes to Rs 38 thousand per household from subsidy offered for agricultural mechanization. The subsidy offered by state governments for purchasing agricultural implements and machinery varied from Rs 12 thousand for seed drill to Rs 75 thousand for power tiller. Under NHM, most of the beneficiary availed subsidy for the construction of poly houses/green houses with a subsidy ranging from Rs 70 thousand to Rs 90 thousand. In the east and north-east region, the average subsidy amount was around Rs 17 thousand per household.

In the North region, 3.27 per cent households benefited from CCS and state sponsored programmes in addition to RKVY programmes, 1.22 per cent from mechanization schemes, 0.1 per cent each from watershed and animal husbandry and dairy development programmes and roughly around 5 per cent of the total RKVY beneficiaries availed subsidies from other schemes such as seed distribution, dry land agriculture, fertilizer kits and subsidized plant protection chemicals. Thus, in the entire region around 9.62 per cent of the total 2050 RKVY beneficiary households availed benefits from other programmes. The average amount of subsidy benefit ranged between Rs 4 thousand per beneficiary household from other programmes such as seed / fertilizer distribution and Rs 91 thousand per household who availed the program under watershed development although this amount was availed only by 2 sampled beneficiary households. Beneficiaries received subsidies for construction of green house, for new plantation of apple, pears, apricot orchards, plant protection chemicals, fertilizers as well as spray machines. The average benefit received from NMH program was Rs 30 thousand per beneficiary household. The overall subsidy availed in the north region was Rs 15 thousand per beneficiary household. At the aggregate of all India, about 9.5 per cent of all the RKVY beneficiaries availed benefits from different CCs and state sponsored scheme in addition to RKVY. The average subsidy received by those households who availed the benefits was Rs 24 thousand per household. This was almost half of the average amount of subsidy of around 40 thousand per household under the RKVY programme.

# Chapter 6

## Analysis of Benefits Received for Institutional/ Infrastructure Projects

### 6.1 Background

Public investment in agriculture has positive influence on agricultural growth and farmers' income (Fan et al. 1999). It has been established that higher growth in agriculture has larger impact on rural poverty as compared to growth in non-agricultural sector. It is evident from the literature that India's agricultural growth positively impacted different social groups and regions through increase in consumption, employment and income and lower food prices (Datt and Ravallion 1998; Jewitt and Baker 2007; Hazell 2009). A sustained higher agricultural growth tends to narrow down the income inequality among the social groups and also generate both farm and off-farm employment opportunities in less developed areas (Hazell and Ramasamy 1991). However, a perceptible decline in public investment had affected agricultural growth through 1990s and early 2000s. There has been a positive growth in India's agriculture since mid-2000s due to reversal of fall in public investment. Therefore, it is imperative to infuse adequate amount of public and private investment in agriculture for achieving desirable growth rate through improvement in crop productivity, market infrastructure, soil health and extension support services.

*Rashtriya Krishi Vikas Yojana (RKVY)* is a novel initiative by the Government of India, which encourages the state governments to increase public investment in agriculture and allied sectors. RKVY has focused on 21 major areas within agriculture and allied sector with a view to bring about a holistic development of the sector. The programme has been designed so meticulously that interventions in these focus areas benefit not only the landed farmers in rural areas but also agricultural labourers who generally engage in livestock rearing for supplementing their household income. It is interesting to note that all the major focus areas encompass infrastructure development as an important component of the programme. The infrastructure component has been included in most of the sector/area specific projects irrespective of its target group, i.e., farmer beneficiary or institutions. The inclusion of the infrastructure components among the sector specific projects has created tangible assets to be utilised for improving the productivity growth in agricultural sector.

RKVY has inbuilt flexibility in funding the projects particularly innovative and infrastructure oriented projects with a strong emphasis on increasing state budgetary allocation for agriculture and allied sectors for making provision of funding under the programme. During the 11th plan period, RKVY funds were available to state governments under two distinct streams viz., Stream I and Stream II. Under Stream I, at least 75 per cent of the amount allocated to a particular state should be utilised for undertaking specific projects. Under Stream II, the remaining amount ought to be used for strengthening the existing state plan projects and also for filling the resource gaps. Although RKVY is a state plan scheme, central government provides 100 per cent grant for executing the projects/schemes proposed under this programme. The District Agricultural Plan

and State Agricultural Plan provide thrust areas for designing of schemes and financial resources required for proper implementation.

The projects focusing on creation of infrastructure and assets have been designed and implemented by various institutions in the states. Generally, infrastructure projects have a relatively longer duration and higher amount allocated as compared to the normal projects. Therefore, these infrastructure oriented projects under RKVY have been largely implemented by the government departments, State Agricultural Universities, government owned autonomous corporations, bodies and cooperative organisations. The present chapter analyses the RKVY projects implemented by various institutions located in different states.

## 6.2 Data Collection

The information related to infrastructure projects implemented by various institutions was collected through a survey method. For collecting information, a list of all the institutions including State Agricultural Universities, Research Institutes, Government Departments, state autonomous corporations and cooperative organisations were prepared with full contact details. A structured questionnaire was prepared and then pretested before it was sent to these institutions soliciting them to complete the questionnaire and send back to the ISEC. After mailing the questionnaire, the research team at ISEC had followed up with the respondents through telephonic calls and e-mails to get the filled-in questionnaires from them.

Among others, questionnaire sought information about the nature and type of project, objectives and their achievement, project partners, funding pattern, budget details and stage of completion. Further, information related to expected output, actual output, expected outcome, actual outcome, implementation constraints and suggestions for effective implementation of the projects by various institutions.

### 6.2.1 Status of Responses Received through Survey

Based on the details of infrastructure projects available from the RKVY web portal and other relevant information compiled from the RKVY nodal agency of various state governments, questionnaire was sent to the authorities who implemented the infrastructure projects at their respective institutions/departments. The details of the filled-in questionnaire received through survey by regions are given in Table 6.1. There were 856 filled-in questionnaire received from various institutions across regions in India. It can be observed that a relatively high number of filled-in questionnaire were received from northern region, which accounted for 32.7 per cent of total number of questionnaires. From the south region, 234 filled-in questionnaires were received, which constituted about 27.3 per cent. From the east and north east region, and west and central region, details for 181 projects and 161 projects, respectively were received. A relatively low level of response received about the infrastructure projects implemented in the central and western region despite the fact that this region accounted for about 32 per cent of the total number of the infrastructure projects implemented in India during the 11th Plan (Kumar et al. 2013: 49). The overall share of the filled-in questionnaire received to total number of infrastructure projects as reported in the RKVY web portal during the 11th Plan was 54.0 per cent.

Table 6.1: Number of filled-in questionnaires received

| Region | No. of filled-in questionnaires received | % distribution |
|---|---|---|
| North | 280 | 32.71 |
| South | 234 | 27.34 |
| West & Central | 161 | 18.81 |
| East & North East | 181 | 21.14 |
| Total | 856 | 100.00 |

## 6.3 Distribution of Infrastructure Projects by Type of Institutions

The infrastructure projects have been implemented by various organisations located in different states. These organisations/institutions have been grouped under three categories viz., State Agricultural Universities/Indian Council of Agricultural Research (ICAR) institutes, state government departments and state government autonomous corporations, boards and cooperatives. These institutions are largely involved in designing and implementing the infrastructure projects. The distribution of the infrastructure projects by type of institutions is provided in Table 6.2. It can be observed that overall state government departments such as Departments of Agriculture, Horticulture, Animal Husbandry, Watershed and Sericulture implemented about 56 per cent of the infrastructure projects in the country.

In the north region, state line departments of agriculture implemented about 234 projects (84 per cent) out of 280 projects. The State Agricultural Universities (SAUs)/ICAR institutes accounted for about 11 per cent of the infrastructure projects, while state corporations/boards/cooperatives accounted for about five per cent of the projects. In the south, SAUs/ICAR institutes implemented over 50 per cent of the infrastructure projects. About 77 projects were implemented by the state government line departments and 36 projects by state autonomous corporations/boards. In terms of per cent distribution, they respectively accounted for about 33 per cent and 15 per cent.

Table 6.2: Number of infrastructure projects by type of institutions

| Type of institution | North | South | West & Central | East & North east | Total |
|---|---|---|---|---|---|
| SAU's/ICAR Institutes | 31 (11.0) | 121 (51.7) | 71 (44.1) | 32 (17.7) | 255 (29.8) |
| State Govt. Departments | 234 (83.6) | 77 (32.9) | 41 (25.5) | 128 (70.7) | 480 (56.1) |
| Corporations/ Boards/ Cooperatives | 15 (5.4) | 36 (15.4) | 49 (30.4) | 21 (11.6) | 121 (14.1) |
| Total number of projects | 280 (100) | 234 (100) | 161 (100) | 181 (100) | 856 (100) |

*Note:* Figures in the parentheses indicate respective percentage of total

In the west and central region, numbers of infrastructure projects were more or less evenly distributed across implementing institutions. The SAUs/ICAR institutes implemented about 44 per cent of the total projects designed for this region. The state government departments and corporations/boards/cooperatives accounted for about 26 per cent and 30 per cent of the infrastructure projects, respectively implemented in the region. As observed in the north region,

state government departments had taken a lead in designing and implementing the infrastructure projects in the east and north-east region also. The government departments involved in implementing about 71 projects, while SAUs/ICAR institutes and state corporations/boards accounted for about 18 per cent and 12 per cent of the infrastructure projects, respectively.

## 6.4 Distribution of Projects by Type and Importance

Based on the nature of components of the projects that have been implemented by various institutions, the projects are broadly grouped under normal projects, infrastructure projects and normal cum infrastructure projects. Generally, normal projects do not contain infrastructure and asset components. They are mainly targeted towards individual beneficiaries in the form of training and capacity building and field trials in the farmers' field. However, infrastructure projects are mainly meant for creating assets such as construction of laboratories, e-auction system, market yards, cold storages, training halls, warehouses and rain shelters. There are also projects which are both beneficiary and infrastructure oriented.

The distribution of infrastructure projects by type is presented in Table 6.3. The projects are grouped as infrastructure oriented, beneficiary oriented and infrastructure cum beneficiary oriented projects. Out of total number of projects, 42 per cent were infrastructure oriented and 34 per cent were beneficiary oriented while 24 per cent were both infrastructure and beneficiary oriented. The distribution of a higher number of infrastructure oriented projects implies that various implementing institutions gave more importance to creation of tangible assets, which could help the farmers directly or indirectly in improving agricultural productivity. Among regions, the west and central region implemented the highest number of infrastructure oriented projects followed by the south region. Out of the total projects in the west and central region, 53 per cent were infrastructure oriented, 19 percent were beneficiary oriented and 28 per cent were combination of both types. However, in south region, various institutions had implemented a relatively large number of infrastructure–cum-beneficiary oriented projects, which constituted about 32 per cent of total projects in the region. In the north region, infrastructure oriented projects constituted 44 per cent, while beneficiary oriented projects and infrastructure-cum-beneficiary oriented projects accounted for 35 per cent and 21 per cent, respectively. In the case of east and north east region, beneficiary oriented institutional projects constituted the highest proportion with 47 per cent followed by infrastructure projects (36 per cent). The infrastructure-cum-beneficiary oriented projects accounted for about 17 per cent.

Table 6.3: Number of infrastructure projects by type

| Project type | North | South | West & Central | East & North East | Total |
|---|---|---|---|---|---|
| Infrastructure oriented | 124 (44.3) | 80 (34.2) | 85 (52.80) | 66 (36.4) | 355 (41.5) |
| Beneficiary oriented | 98 (35.0) | 79 (33.8) | 31 (19.3) | 85 (47.0) | 293 (34.2) |
| Both | 58 (20.7) | 75 (32.0) | 45 (27.9) | 30 (16.6) | 208 (24.3) |
| Total number of projects | 280 (100) | 234 (100) | 161 (100) | 181 (100) | 856 (100) |

The state and central governments give importance to certain agricultural issues to address them on a priority basis. Perhaps, these issues are such that they are likely to hinder the agricultural growth and crop productivity in the long run if they are not addressed adequately. Therefore, these issues merit the attention of the policy makers and require designing of suitable schemes/developmental programmes with a higher allocation of financial resources. Such schemes/programmes are called as government flagship schemes/programmes. Under the RKVY also, both the state and central governments had designed state flagship and national flagship infrastructure projects for implementation.

The number of infrastructure projects by state and national importance (flagship) is given in Table 6.4. Interestingly, almost all the projects for which details were received through survey had fallen under either state flagship or national flagship projects. However, two projects implemented in the east and north-east region were grouped under both the state and national flagship projects. Except in east and north-east region, state flagship projects accounted for over 72 per cent in all other regions. In the east and north-east region, national flagship projects constituted about 73 per cent. Overall, 66 per cent of the infrastructure projects were of state flagship projects and 33 per cent were national flagship projects.

Table 6.4: Number of infrastructure projects by state and national importance

| Importance/Flagship | North | South | West & Central | East & North East | Total |
|---|---|---|---|---|---|
| State Flagship | 201(71.8) | 187 (79.9) | 133 (82.6) | 47 (26.0) | 568 (66.4) |
| National Flagship | 79 (28.2) | 47 (20.1) | 28 (17.4) | 132 (72.9) | 286 (33.4) |
| Both | 0 (0) | 0 (0) | 0 (0) | 2 (1.1) | 2 (0.2) |
| Total | 280(100) | 234 (100) | 161 (100) | 181 (100) | 856 (100) |

*Note:* Values in the parentheses indicate percentage

## 6.5 Distribution of Projects by Sectors

During the 11th plan period, various infrastructure projects under RKVY were spread across 21 sectors in different regions of the country. The numbers of projects varied across the regions depending upon the priority set for a holistic development of the agriculture in the states. The distribution of the infrastructure projects by sectors is given in Table 6.5. Out of total infrastructure projects, relatively a large number of them were focused on animal husbandry sector. In fact, animal husbandry sector accounted for 23 per cent of the total projects. The second highest number of infrastructure projects were implemented under research (14 per cent) followed by horticulture (9.4 per cent), seed (7.9 per cent) and fisheries (5.6 per cent). The least number of infrastructure projects were under the cooperative sectors.

The distribution of the infrastructure projects was quite varied across regions by sectors with the highest number of projects implemented in the north region followed by south, east and north east, and west and central region. In the north region, animal husbandry attracted about 30 per cent of the total number of projects. Similarly, in other regions also the animal husbandry sector received relatively a high priority in designing and implementation of the infrastructure projects with 27.3 per cent in west and central, 17.5 per cent in south and 14.4 per cent in east and north

east region. This pattern is consistent with analysis of the infrastructure projects carried out at the all India level based on the data compiled from the RKVY web portal (Kumar et al 2013: 48). The importance given for developing infrastructure facilities for developing the animal husbandry sector across regions is also consistent with the fact that share of output value of animal husbandry and dairying has been rising over time. Further, in many parts of the country, animal husbandry and dairy production is emerging in an organised industrial production mode with large herd size of animals. This trend has been observed across sub-sectors of animal husbandry including dairying, meat processing and poultry. Therefore, it is imperative to provide required infrastructure facilities such as veterinary hospitals/clinics, artificial insemination centres, laboratory and other testing facilities.

Table 6.5: Number of institutional and infrastructure projects by sector and region

| S. No. | Sector | North | South | W & C* | E & NE** | Total |
|---|---|---|---|---|---|---|
| 1 | Agriculture Mechanization | 2(0.72) | 12(5.13) | 3(1.87) | 5(2.77) | 22 (2.57) |
| 2 | Animal Husbandry | 85(30.36) | 41(17.53) | 44(27.33) | 26(14.37) | 196 (22.90) |
| 3 | Command Area Development | 7(2.5) | 0(0) | 0(0) | 0(0) | 7 (0.82) |
| 4 | Cooperatives and cooperation | 0(0) | 0(0) | 2(1.25) | 0(0) | 2 (0.23) |
| 5 | Crop Development | 11(3.93) | 11(4.71) | 4(2.49) | 11(6.08) | 37 (4.32) |
| 6 | Dairy Development | 16(5.72) | 7(3) | 10(6.22) | 2(1.11) | 35(4.09) |
| 7 | Extension | 14(5) | 6(2.57) | 14(8.7) | 10(5.53) | 44 (5.14) |
| 8 | Fertilizer and INM | 8(2.86) | 2(0.86) | 2(1.25) | 5(2.77) | 17 (1.99) |
| 9 | Fisheries | 14(5) | 9 (3.85) | 4(2.49) | 21(11.61) | 48 (5.60) |
| 10 | Horticulture | 37(13.22) | 26(11.12) | 1(0.63) | 16(8.84) | 80 (9.35) |
| 11 | Information technology | 1(0.36) | 5(2.14) | 0(0) | 0(0) | 6 (0.70) |
| 12 | Innovative programmes / training / capacity building /others | 4(1.43) | 3(1.29) | 8(4.97) | 1(0.56) | 16 (1.87) |
| 13 | Integrated pest management (IPM) | 8(2.86) | 2(0.86) | 2(1.25) | 6(3.32) | 18 (2.10) |
| 14 | Marketing & Post Harvest management | 7(2.5) | 15(6.42) | 13(8.08) | 10(5.53) | 45 (5.26) |
| 15 | Minor/micro irrigation | 13(4.65) | 4(1.71) | 0(0) | 1(0.56) | 18 (2.10) |
| 16 | Non Farm Activities | 0(0) | 4(1.71) | 0(0) | 4(2.21) | 8 (0.93) |
| 17 | Natural Resource Management | 5(1.79) | 1(0.43) | 1(0.63) | 12(6.63) | 19 (2.22) |
| 18 | Organic farming/bio-fertilizer | 13(4.65) | 8(3.42) | 7(4.36) | 5(2.77) | 33 (3.85) |
| 19 | Research | 14(5) | 67(28.64) | 15(9.32) | 25(13.82) | 121 (14.13) |
| 20 | Seed | 16(5.72) | 10(4.28) | 30(18.64) | 12(6.63) | 68 (7.94) |
| 21 | Sericulture | 5(1.79) | 1(0.43) | 1(0.63) | 9(4.98) | 16 (1.87) |
| | **Total** | **280(100)** | **234(100)** | **161(100)** | **181(100)** | **856 (100)** |

*Note:* Figures in the parentheses indicate percentage to total,

* W & C- West and Central India, **E & NE –East and North East

Horticulture received the second highest importance in terms of numbers of infrastructure projects implemented in the north region. Seed sector accounted for about 6 per cent of the total numbers of projects. Interestingly, in the south region, a relatively high importance was given to research, which accounted for 28.6 per cent of infrastructure projects. These projects were largely implemented by the State Agricultural Universities and research institutes for enabling them to carry out research in new technologies. The infrastructure projects implemented in these institutions included, among others, such as setting up of bio-pesticides production laboratory, tissue culture laboratory, poly house, facilities for quality seed production, demonstration of

technology, purchase of laboratory equipments and class room renovations. Horticulture sector in the south region attracted about 11.1 per cent of the total projects and marketing and post harvest management about 6.4 per cent of the projects. Agricultural mechanisation also received considerable attention in the south region.

In the west and central region, a relatively large number of projects were implemented under seed sector after animal husbandry. The seed sector accounted for about 18.6 per cent of the total infrastructure projects in this region. The infrastructure implemented under seed sector included, among others, strengthening of state seed processing centre, seed testing laboratory, seed storage warehouses and modernisation of seed farms. Research also received considerable attention with 9.3 per cent of the projects, which were generally implemented by the State Agricultural Universities. Similarly, in the east and north east region, projects related to research accounted for about 13.8 per cent of the infrastructure projects. As expected, fisheries sector attracted about 11.6 per cent of the projects. Some of the infrastructure projects implemented under fisheries sector included construction of fish rearing area, strengthening of fish seed production farm, supply of fish boat to fishermen, renovation of brackish water fish seed farm and development of mobile fish health laboratory cum seed production system. Horticulture, natural resource management, seed and crop development also received considerable attention for strengthening the infrastructure facilities leading to development of these sectors.

## 6.6 Distribution of Projects by the Status of Completion, Ongoing and Duration

The infrastructure projects have long gestation period and often they are implemented in a phased manner. The status of the implementation of projects, are grouped under completed, ongoing, not implemented and abandoned. Out of the total number of infrastructure projects launched during the 11th Plan, about 74 per cent of them were completed and 24 per cent were ongoing (Table 6.6). Unfortunately, 14 projects were abandoned and 4 projects were not implemented. Among regions, east and north-east region showed the highest proportion of completed projects with 92.3 per cent and the remaining projects were ongoing. Interestingly, there were not abandoned and non-implemented projects in this region. However, in the north region, 8 projects were abandoned while one project was not implemented. About 74.3 per cent of total infrastructure projects were reportedly completed and 22.5 per cent were ongoing.

Table 6.6: Status of institutional and infrastructure projects (Numbers)

| Status of the project | North | South | W & C* | E & NE** | Total |
|---|---|---|---|---|---|
| Completed | 208(74.29) | 155 (66.24) | 106 (65.84) | 167 (92.27) | 636 (74.30) |
| Ongoing | 63(22.5) | 78 (33.34) | 47 (29.2) | 14 (7.74) | 202 (23.60) |
| Not implemented | 1(0.36) | 1 (0.43) | 2 (1.25) | 0 (0) | 4 (0.47) |
| Abandoned | 8(2.86) | 0 (0) | 6 (3.73) | 0 (0) | 14 (1.63) |
| Total | 280(100) | 234 (100) | 161 (100) | 181(100) | 856 (100) |

*Note:* Figures in the parentheses indicate percentage to total,
* W & C- West and Central India, **E & NE –East and North East

In the south region, 66.2 per cent of the proposed projects were completed, while 33.3 per cent of projects were reported as ongoing. One project was not implemented in this region. Similarly, in

the west and central region, two infrastructure projects were not implemented and 6 projects were reportedly abandoned. It can be noted that the implementing agencies in north, and west and central region reported both abandonment and non-implementation of certain infrastructure projects for various reasons. Abandonment of projects has serious implications for financial resources committed and development of target activities for which these projects were designed.

There are various reasons reported by the implementing agencies for delay in execution, non-implementation and abandonment of projects. The development of varieties and hybrids involve considerable amount of time for testing during different seasons and across regions. In fact, testing of varieties at multi-locations for assessing their wide geographical adaptations is an important stage of varietal development. This often results in delay in release of improved varieties with desirable qualities. The delay in completion of the infrastructure projects can also be attributed to various non-technical reasons. Implementing agencies reported delay in release of funds and partial release of money out of total sanctioned budget as an important reason for non-completion of the projects on time. Further, purchase of required materials and equipments face various administrative hurdles such as procedural delay in finalising the tender process due to recasting of schedule of rates given by the state public works development, formation of tender committee and inadequate response to tenders. These problems often lead to non-purchase of equipments or materials and then encounter the problem of cost escalations.

The implementing agencies also reported extreme weather conditions for delay in completing the infrastructure projects. For instance, prolonged rainy season in the east and north-east region, and drought situation in Konkan, Vidharbha and Marathawada regions for about two years during the 11the Plan period affected timely completion of the projects. Construction works are generally carried out by the state public works department (PWD). It has been reported that for technical reasons often the PWD was slow in completion of the proposed construction activities such as construction of market yards and getting necessary approvals, which led to delay in overall completion of the projects. Implementing agencies also reported various reasons for abandoning the project. These reasons, among others, included stoppage of funding or refusal to release further grants, non-availability of suitable land for establishing infrastructure facilities and conversion of the projects from Stream I to Stream II category, which required the respective state governments to commit resources for completion of the projects. However, such support hardly came from the state governments to fill the resource gap particularly for the infrastructure projects taken up at the Agricultural Universities.

It is quite clear from the discussion that there are many factors operating at policy and institution level affecting the completion of the infrastructure projects on time. Even the short duration projects get extended unduly to longer period. The duration of completion of the infrastructure projects has been grouped into six categories viz., less than one year, 1.0-1.9 years, 2.0-2.9 years, 3.0-3.9 years, 4.0-4.9 years and five or more than five years. The distribution of the projects by duration and sector is given in Table 6.7. It can be observed that over 60 per cent of the projects came under the category of the less than 2 years of duration. In fact, about 40.4 per cent of the projects were of 1.0-1.9 year of duration. About 15.7 per cent of the projects fell under 3.0-3.9 years. Further, nearly 50 projects each had the completion duration of 4.0-4.9 year and more than 5.0 years duration.

Table 6.7: Year wise distribution of institutional and infrastructure projects (Numbers)

| Duration (years) | North | South | W & C* | E & NE** | Total |
|---|---|---|---|---|---|
| Less than one year | 4(1.43) | 13(5.56) | 41(25.47) | 117(64.65) | 175(20.45) |
| 1-1.9 | 169(60.36) | 93(39.75) | 57(35.41) | 27(14.92) | 346(40.43) |
| 2-2.9 | 24(8.58) | 29(12.4) | 26(16.15) | 24(13.26) | 103(12.04) |
| 3-3.9 | 53(18.93) | 58(24.79) | 15(9.32) | 8(4.42) | 134(15.66) |
| 4-4.9 | 6(2.15) | 17(7.27) | 22(13.67) | 5(2.77) | 50(5.85) |
| 5.0 | 18(6.43) | 20(8.55) | 0(0) | 0(0) | 38(4.44) |
| More than five | 6(2.15) | 4(1.71) | 0(0) | 0(0) | 10(1.17) |
| Total | 280(100) | 234(100) | 161(100) | 181(100) | 856(100) |

*Note:* Figures in the parentheses indicate percentage to total,
* W & C- West and Central India, **E & NE –East and North East

In north and south regions, 60.4 per cent and 39.8 per cent of the infrastructure projects had the duration of 2.0-2.9 years, respectively. These regions also had a relatively large numbers of projects to be completed within 3.0-3.9 years. There were 24 projects with the completion period of 5 and more than 5 years. In the case of west and central, and east and north-east regions, nearly 25.5 per cent and 64.5 per cent of the projects came under the category of less than one year duration, respectively. Further, about 35.4 per cent of the infrastructure projects had the completion duration of 1.0-1.9 year in the west and central region, while 14.9 per cent in the east and north-east region. It can be observed that none of the infrastructure projects fell under the category of more than 5 years duration in the west and central, and east and north-east region. Overall, it is clear that a relatively large proportion of the infrastructure projects were of short duration oriented and had the completion period of less than 2 years.

The successful completion of the projects can be assessed from the extent of achievement of proposed objectives during the project period. The extent of completion of objectives of the projects, varied by sectors and regions (Table 6.8). The analysis focussed on achievement of all the objectives of projects in relation to the total number of projects implemented under various sectors. Out of 856 reported infrastructure projects, only 502 projects (58.7 per cent) recorded a hundred per cent achievement of objectives and the remaining projects did not fulfil all the proposed objectives. Among the sectors, about 66 project of projects implemented under animal husbandry achieved all the objectives followed by research with 51.2 per cent. In fact, as discussed animal husbandry and research sectors had implemented more number of infrastructure projects than other sectors. About 78 per cent of the infrastructure projects under seed and 45 per cent under horticulture sector recorded fulfilment of all the proposed objectives at all India level. Out of total projects implemented under fisheries, 70.8 per cent achieved all the objectives. Among regions, north registered the highest proportion of projects achieving all the objectives during the project period. Out of total number of projects, 80.4 per cent in north, 38.9 per cent in south, 57.1 per cent in west and central, and 51.9 per cent in east and north-east region achieved a hundred per cent of all the objectives.

Table 6.8: Sector wise and region wise cent per cent objectives achieved (Numbers)

| S. No. | Sector | North | South | W & C* | East & NE** | Total |
|---|---|---|---|---|---|---|
| 1 | Agriculture Mechanization | 2 (100) | 3 (25) | 1 (33.4) | 3 (60) | 9 (41) |
| 2 | Animal Husbandry | 67 (78.9) | 23 (56.1) | 26 (59.1) | 15 (57.7) | 131 (66.9) |
| 3 | Command Area Development | 2 (28.6) | 0 (0) | 0 (0) | 0 (0) | 2 (28.6) |
| 4 | Cooperatives and cooperation | 0 (0) | 0 (0) | 2 (100) | 0 (0) | 2 (100) |
| 5 | Crop Development | 10 (91) | 2 (18.2) | 2 (50) | 2 (18.2) | 16 (43.3) |
| 6 | Dairy Development | 12 (75) | 4 (57.2) | 1 (10) | 1 (50) | 18 (51.5) |
| 7 | Extension | 13 (92.9) | 2 (33.4) | 9 (64.3) | 8 (80) | 32 (72.8) |
| 8 | Fertilizer and INM | 8 (100) | 0 (0) | 1 (50) | 1 (20) | 10 (58.9) |
| 9 | Fisheries | 13 (92.9) | 3 (33.4) | 3 (75) | 15 (71.5) | 34 (70.9) |
| 10 | Horticulture | 21 (56.8) | 8 (30.8) | 0 (0) | 7 (43.8) | 36 (45) |
| 11 | Information technology | 1 (100) | 5 (100) | 0 (0) | 0 (0) | 6 (100) |
| 12 | Innovative Programmes/training/capacity building/others | 3 (75) | 2 (66.7) | 4 (50) | 0 (0) | 9 (56.3) |
| 13 | Integrated pest management (IPM) | 7 (87.5) | 1 (50) | 2 (100) | 2 (33.4) | 12 (66.7) |
| 14 | Marketing & Post Harvest management | 4 (57.2) | 5 (33.4) | 8 (61.6) | 3 (30) | 20 (44.5) |
| 15 | Minor/micro irrigation | 10 (77) | 4 (100) | 0 (0) | 0 (0) | 14 (77.8) |
| 16 | Non Farm Activities | 0 (0) | 2 (50) | 0 (0) | 1 (25) | 3 (37.5) |
| 17 | Natural Resource Management | 5 (100) | 0 (0) | 0 (0) | 3 (25) | 8 (42.2) |
| 18 | Organic farming/bio-fertilizer | 13 (100) | 1 (12.5) | 5 (71.5) | 0 (0) | 19 (57.6) |
| 19 | Research | 13 (92.9) | 21 (31.4) | 6 (40) | 22 (88) | 62 (51.3) |
| 20 | Seed | 16 (100) | 4 (40) | 22 (73.4) | 7 (58.4) | 49 (72.1) |
| 21 | Sericulture | 5 (100) | 1 (100) | 0 (0) | 4 (44.5) | 10 (62.5) |
| | Total | 225 (80.4) | 91 (38.9) | 92 (57.2) | 94 (52.0) | 502 (58.7) |

*Note:* Figures in the parentheses indicate percentage to total

* W & C- West and Central India, **E & NE –East and North East

Within regions, 78.8 per cent of projects implemented under the animal husbandry sector achieved almost all the objectives. Horticulture had 37 projects, out of which 56.8 per cent

fulfilled all the proposed objectives. Interestingly, extension, fertiliser and INM, IPM, organic farming/bio-fertilisers, research and seed sector showed almost all the projects achieving all the objectives. A higher proportion of projects implemented under crop development and minor/micro irrigation sectors also showed a hundred per cent achievement of the objectives.

In the south region, out of the total number of projects implemented under animal husbandry, 56.1 per cent of them achieved all the objectives. Similarly, horticulture sector had 26 projects but only 30.8 per cent of the projects fulfilled all the objectives. In research sector too, a lower proportion of the projects could achieve the proposed objectives fully. In the west and central region, 73.3 per cent of the projects under seed sector fulfilled all the objectives. Animal husbandry had a large number of projects and a low proportion of them (59.1 per cent) could meet with all the objectives. Similarly, out of the 10 projects implemented under dairy development in this region, only one project achieved all the objectives. There are several projects under various sectors which could achieve the objectives partially. In the east and north-east region, the large sectors in terms of number of projects, achieved a lower proportion of the proposed objectives. Out of total number of projects under animal husbandry, only 57.7 per cent of them achieved a hundred per cent of all the objectives. Under research, 88 per cent of the projects could fulfil all the objectives during the project period. However, fisheries sector had 21 projects out of which about 71 per cent of them fulfilled all the objectives. A lower proportion of the infrastructure projects implemented under sector such as crop development, horticulture, marketing and post harvest management and natural resource management achieved all the proposed objectives. Overall, it is evident from the analysis of data that unfortunately projects implemented under major sectors could achieve the proposed objectives partially. The limited success in achieving the proposed objectives will have serious implications for meeting the expected outputs and outcomes of the projects.

## 6.7 Allocation, Release and Expenditure under Infrastructure Projects

Availability of adequate financial resources is crucial for carrying out all the proposed project activities on time and avoiding undue delay in completion. The level of utilisation of finances reveals the financial efficiency of the implementing agencies. The details of allocation, release and expenditure under infrastructure/institutional projects are given in Table 6.9. It can be observed that total allocation, as revealed by the implementing agencies, stood at Rs 2,57,464 at the all India level. The share of this allocation in total amount allocated as reported in RKVY web portal was 26.9 per cent only. Among regions, allocation was relatively high in the west and central region as compared to other regions. The level of release of allocated amount varied across regions. The proportion of release to allocation was slightly higher for north, while lower for south, west and central, and east and north-east regions.

The expenditure performance of the implementing agencies seems to be impressive, which is evident from the expenditure to release ratio. The overall expenditure to release ratio was 91.5 per cent implying that only 8.5 per cent of the release was not utilised by the implementing agencies. The expenditure to release ratio was recorded the highest in east and north-east with 99.0 per cent followed by 95.3 per cent in west and central, and 94.4 per cent in north region. South region showed a lower expenditure to release ratio at 79.7 per cent, which is due to the fact that about 33 per cent of the infrastructure projects are reported to be ongoing.

Table 6.9: Region wise allocation, release and expenditure
(Rs. lakh)

| Region | Allocation | Release | Expenditure | E/R (%) |
|---|---|---|---|---|
| North | 69543.1 | 67293.5 | 63512.8 | 94.38 |
| South | 62599.4 | 60594.9 | 48309.6 | 79.73 |
| West & Central | 93198.3 | 68492.5 | 65280.9 | 95.31 |
| East and North East | 32123.1 | 32699.6 | 32386.3 | 99.04 |
| Total | 257463.9 | 229080.5 | 209489.6 | 91.45 |

Distribution of expenditure by sector and region is provided in Table 6.10. It can be observed that expenditure on infrastructure projects was the highest in central and west region with Rs 65,281 lakh followed by north with Rs 63,513 lakh and south with Rs 48,310 lakh. The expenditure in east and north-east region was Rs 32,386 lakh. Within central and west region, animal husbandry sector accounted for 28.5 per cent of the total expenditure. The next highest amount of expenditure was on the infrastructure projects implemented under marketing and post harvest operations followed by seed and dairy development. The observed expenditure pattern is in congruence with the distribution of projects by sector.

In the north region, agricultural mechanisation accounted for 24.3 per cent of the total expenditure incurred on infrastructure projects. In fact, northern states particularly Punjab, Haryana and parts of Uttar Pradesh are experiencing labour shortage, which has accentuated the need for mechanisation of agricultural operations. There has been reported increase in average size of operated area in these states during the recent years. The increase in farm size and shortage of agricultural labour, therefore, necessitated the increased use of agricultural machineries. The mechanisation of agricultural operations not only helps to save labour but also timely completion of works. There are studies show that agricultural mechanisation tends to improve crop productivity. In view of these positive aspects about the mechanisation, farmers adopted increased level of mechanisation from sowing to harvesting and threshing of grains. Given the above reasons, RKVY also supported this move through higher expenditure on agricultural mechanisation. Under this programme, farmers are given agricultural machineries such as cultivator, rotavator, tiller, combine harvester, thresher, weeder and sprayer at subsidised rate irrespective of category of the farmers. After mechanisation, natural resource management received the priority in terms of expenditure with 20.3 per cent followed by extension (15.0 per cent) and dairy development (6.1 per cent).

Similarly in the south region, agricultural mechanisation received the first highest priority in terms of expenditure with 31.8 per cent. Southern states also experience a significant rise in wage rates due to scarcity of agricultural labourers during the recent years. This has forced the farmers to adopt mechanisation of various agricultural operations. Horticulture sector contributes significantly to value of agricultural output in southern states. In order to improve the productivity of horticulture sector, various schemes were launched across different sub-sectors of horticulture including post harvest management and processing. As a result, horticulture sector accounted for the second highest share of 17.5 per cent of the total expenditure. Animal husbandry also received almost equal importance with the expenditure share of 15.6 per cent. In fact, there is increased consumption demand for animal based products such as milk, meat and eggs. Therefore, it is imperative to strengthen the animal husbandry sector through higher investment for improving animal health and nutrition.

Table 6.10: Sector wise expenditure of the institutional and infrastructure projects
(Rs in lakh)

| S. No. | Sector | North | South | W & C | E & N E | Total |
|---|---|---|---|---|---|---|
| 1 | Agriculture Mechanization | 15388.6 (24.3) | 15316.2 (31.8) | 393.6 (0.7) | 588.6 (1.9) | 31686.8 (15.2) |
| 2 | Animal Husbandry | 3826.1 (6.1) | 7535.7 (15.6) | 18598.1 (28.5) | 8513.9 (26.3) | 38473.6 (18.4) |
| 3 | Cooperative | 367.5 (0.6) | 0 (0) | 599.1 (1) | 0 (0) | 966.6 (0.5) |
| 4 | Crop Development | 2903.1 (4.6) | 997.3 (2.1) | 317.3 (0.5) | 1535.7 (4.8) | 5753.3 (2.8) |
| 5 | Dairy Development | 6056.4 (9.6) | 1194.4 (2.5) | 8392.7 (12.9) | 667.5 (2.1) | 16310.8 (7.8) |
| 6 | Extension | 9506.7 (15) | 202.4 (0.5) | 2996.1 (4.6) | 5887.9 (18.2) | 18592.9 (8.9) |
| 7 | Fertilizer and INM | 31.7 (0.1) | 262.5 (0.6) | 410.6 (0.7) | 548.5 (1.7) | 1253.3 (0.6) |
| 8 | Fisheries | 958 (1.6) | 1859.6 (3.9) | 544.6 (0.9) | 1303.3 (4.1) | 4665.4 (2.3) |
| 9 | Horticulture | 2899.3 (4.6) | 8420.2 (17.5) | 85.9 (0.2) | 2298.1 (7.1) | 13703.4 (6.6) |
| | information technology | 0 (0) | 1128.6 (2.4) | 0 (0) | 0 (0) | 1128.6 (0.6) |
| 10 | Innovative Programmes | 562.9 (0.9) | 350.1 (0.8) | 1725.6 (2.7) | 50 (0.2) | 2688.6 (1.3) |
| 11 | Integrated pest management (IPM) | 26.8 (0.1) | 94.4 (0.2) | 146.8 (0.3) | 145.8 (0.5) | 413.6 (0.2) |
| 12 | Marketing & Post Harvest management | 0 (0) | 1974.2 (4.1) | 11248.3 (17.3) | 1062.7 (3.3) | 14285.1 (6.9) |
| 13 | Minor/micro irrigation | 265.1 (0.5) | 151.6 (0.4) | 0 (0) | 80 (0.3) | 496.7 (0.3) |
| 14 | Non Farm Activities | 0(0) | 1184.6 (2.5) | 0 (0) | 210 (0.7) | 1394.6 (0.7) |
| 15 | NRM | 12837.6 (20.3) | 1.2 (0.1) | 11.3 (0.1) | 3174.9 (9.9) | 16024.9 (7.7) |
| 16 | Organic farming/bio-fertilizer | 4111.2 (6.5) | 129 (0.3) | 7741.1 (11.9) | 271.6 (0.9) | 12252.8 (5.9) |
| 17 | Research | 301.9 (0.5) | 5738 (11.9) | 1278.2 (2) | 3373.1 (10.5) | 10691.1 (5.2) |
| 18 | Seed | 3181.4 (5.1) | 1431.5 (3) | 10151.9 (15.6) | 2007.3 (6.2) | 16772 (8.1) |
| 19 | Sericulture | 289.2 (0.5) | 339 (0.8) | 640.5 (1) | 668 (2.1) | 1936.7 (1) |
| | Total | 63512.8 (100) | 48309.7 (100) | 65281 (100) | 32386.4 (100) | 209489.7 (100) |

*Note:* Figures in the parentheses indicate percentage to total

In the east and north-east region also, animal husbandry sector accounted for the highest proportion of total expenditure. The share of expenditure on animal husbandry was 26.3 per cent. In fact, per capita meat consumption in north-east is relatively high as compared to other regions. Interestingly, extension sector received a relatively high priority after the north region with 18.2 per cent of the total expenditure. Research and natural resource management accounted for 10.5

per cent and 9.9 per cent of the total expenditure. Overall, expenditure pattern reveals more or less the priority given by different states in each region for holistic development of the agriculture.

## 6.8 Achievements of Infrastructure/Institutional Projects

Generally, the proposals submitted for approval are supposed to mention the likely contributions of the proposed projects. The contributions can encompass advancement in knowledge generation, varietal development, development of machineries, organic inputs, strengthening of lab facilities, training and capacity building, creation of processing or storage facilities and strengthening of infrastructure facilities in the Agricultural Universities/research institutes. In order to capture various types of contributions, project proposals specify expected output and expected outcomes. After the completion of the projects, the implementing agencies have to provide information about to what extent the expected output and outcomes were translated into actual output and outcomes. The level of fulfilment of expected and actual output and outcomes can be considered for assessing the achievements of the projects.

However, information received from the implementing agencies through survey were specific to different projects and they were found to be patchy. Further, most of the information was qualitative in nature and density of information was so high that it becomes difficult to interpret them meaningfully. Notwithstanding, details of output and outcomes by major projects, sectors and states are provided in Annexure 6.1. It can be observed that the expected output and outcomes seem to have been achieved across projects implemented under different sectors. Achievement of outputs can be seen in terms of creation of assets such as establishing mobilising laboratories, pesticide and bio-control laboratories, construction of community irrigation facilities, soil and water conservation structures, construction of shallow wells, bore wells, drains, soil testing laboratories, increase in area under improved varieties and so on. Under these projects, farmers were also trained and built capacity to apply new technologies, given certified seeds, organic inputs, improved breeds of animals, tarpaulins, solar lanterns and similar useful inputs. Outcomes of the projects, as reported by the implementing agencies, among others included increase in productivity of various crops, improved soil fertility, improved water infiltration, increased seed germination, reduced cost of cultivation, improved training facilities, increased milk yield, wool production, increase in youth employment and enhanced farmers' knowledge and skill in doing farming activities.

## 6.9 Constraints Faced during Implementation of Infrastructure Projects

The constraints faced by the implementing agencies while executing the project activities are discussed here. The constraints or problems in implementation vary by nature of projects and regions. These constraints as reported by the implementing agencies are provided by regions.

### North Region

The success of the project depends on the proper planning, execution and implementation. If any of the steps are not followed properly, it will lead to mismanagement and limited success in achieving the objectives. Implementing agencies in the north region faced many constraints

while implementing the infrastructure projects. It was reported by the implementing agencies that there was delay in selection and approval of action plans at SLSC meeting held in the nodal departments. Delay in project approval results in operational difficulties for timely completion of the projects. This leads to delay in the release of funds from the nodal department to the principal investigator/implementing agencies and incidentally it will be released at the fag-end of year or after complementing the season in case of seasonal experiments.

In addition, implementing agencies reported that fund was not released as per the sanction, which affected the execution of targeted activities. Non availability of adequate funds on time adversely affects the project implementation schedule. Further, nodal department gave priority to line departments in allocation and release of grants. In most states, Department of Agriculture was the nodal agency and therefore tend to give importance to its associated departments. Since the Department of agriculture is acting as a nodal agency, there were problems in getting cooperation from the other departments for smooth operation of the projects. Notwithstanding, unfortunately Agricultural Universities were the least important for nodal agency in the sanction and release of funds.

Another important constraint reported by the implementing departments was the shortage of the staff at various levels. There were wide range of projects implemented across different departments. Therefore, the nature of coordination of work was reportedly complicated and it was suggested that different type of expertise was required. It was reported that collaboration and integration of all systems was the biggest challenge and required various experts.

Tendering involves the tedious process. Due to adverse environment conditions and remoteness of the places, participation of reputed agencies was very poor and therefore less competition for undertaking work. At times the agencies will not participate in bidding for civil works, which posed as a great hindrance for effective implementation of the infrastructure projects.

Selection of beneficiary was a problem for targeted activities like mushroom cultivation where growers were generally small and marginal farmers or landless labourers. They have been growing mushroom after taking the land on lease and the same farmers involved in such activity every year. It was a challenge for Department of Agriculture to identify new beneficiary and due to non availability of new beneficiaries and poor response from farming community, adoption of latest technology in marketing and handling of produce remained poor.

**South Region**

In the south region, implementing agencies reported delay in release of funds, release of funds at the end of financial year, sanction of only 50 percent of the total budget approved by SLSC and non- allocation of fund at the state level for recruitment of staff as major issues for completion of the project on time. When it comes to dealing with the parent organisations, shortage of staff in farms and nurseries, administrative and financial decisions at the institute level were found to be major problems for the implementation of project in a effective way. The preparation and finalisation of tender often leads to delay in purchase of equipments, time and consumption for construction of all the components in the field. Fluctuations in rupee value in the international

market also affected the cost of purchase of equipments. Due to delay in the tender process, civil works could not be completed before the end of the project.

The inability of most of the selected farmer beneficiaries to contribute their share to avail the benefit from project was an important problem faced in the field. Further, there were also issues related to non co-operation of farmers for site selection to conduct field trials, farmer's unwillingness to follow recommended practices and delay in selection of site for construction of market were the major issues faced while implementing the infrastructure projects. Some other problems like convincing the farmer families to live in the farm house to look after IFS components was time consuming, delayed installation of sub surface drains, non availability of staff to implement the project, vagaries in weather conditions, procedural delays, timely non availability of inputs, difficulty in convincing the farmers to introduce new varieties of crops and delay in supply of laboratory equipments to soil test laboratories, were also observed.

**West and Central Region**

The implementing agencies reported that an important constraint faced while dealing with the nodal agency was accessing fund on time. Though the project was approved for a given budget, the fund released during implementation of the project was considerably less than the allocated amount. For projects related to Biotechnological aspects, development of tissue culture involved a protocol of continuous process which required funding on regular basis to meet the expenses towards buying chemicals and other recurring items but the fund released during some years was abruptly stopped. This severely hampered the overall progress of the project.

It was reported that there was a delay in the timely completion of the project as the Public Works Department was reluctant to carry out the changes or modifications suggested by the user departments. The major problem faced was delay in getting the estimates from public work department for necessary approvals. Implementing agencies also reported the tedious process involved in tendering as equipments/other components of the project had to be done through lowest tender, which often leads to a compromise with the quality. Also there was a fluctuation in the tendering system due to many calls for various tenders in spite of regular efforts.

At the research institute level, the implementing agencies reported many problems including unavailability of skilled man power, unavailability of full time dedicated scientists and supporting staffs including technical assistants, lab assistants and lab attendees. There was a problem in getting contractual trained persons for the follow up of the project activities. Even though, the infrastructure facilities for training and capacity building were established, there was a need for involvement of extension specialists to extend those infrastructural facilities to the farmers through some of the schemes implemented by ATMA and Agricultural departments. It was suggested that to utilise all these facilities on a sustainable manner there was a need for timely release of adequate non-recurring budget at once. Further, due to changes in beneficiary share many beneficiaries were opted out of the programme, hence there was reported delay in identifying new beneficiaries in case of beneficiary oriented programmes.

The implementing agencies also reported problems related to non-availability of labour, machineries and materials for civil construction at the project site. Delay in preparation of

proposals, approval of loan and construction of field infrastructures were compounded with climatic problems like long dry spell during rainy season, excess rain, fog, scarcity conditions and rise in temperature.

**East and North-East Region**

The implementing agencies in east and north-east region did not report many problems faced during the implementation of the infrastructure projects. Like in other regions, the major constraints reported during the implementation of the projects were delay in release of funds due to some administrative procedures. The implementing agencies also reported non-availability of trained manpower for completing the projects on time. There were sector specific problems reported by the implementing agencies. In case of animal husbandry, procurement of animals from outside the state through surface transport was really a problem as it required support from various agencies like railway department, road transport, police department and sales tax department.

The procurement of seed testing laboratory equipments, chemicals and, commissioning and equipping of Walk-in-Germination Chamber and seed storage room to make the seed testing laboratory viable as per the quality standards through tendering process unduly delayed the completion of the works. Moreover, the latest know-how for the technical works was reportedly not readily available for reference and guidance.

## 6.10 Suggestions for Effective Implementation of Infrastructure Projects

In view of the problems faced while executing the project activities, the implementing agencies provided various suggestions for effective implementation. These suggestions were grouped by regions.

**North Region**

- Since the RKVY projects are implemented by multi stakeholders, there is a need to have independent Nodal agency which should be fully funded from the scheme.

- Awareness about the schemes and innovative technologies to be created among the famers community or to the beneficiaries

- The annual action plans should be framed before the on-set of fiscal and provision for release of total allocated funds to the implementing agencies. Funds may be released directly by the GoI to the Implementing Agency/ Department as is done in case of the other CSS schemes like NHM, NMMI and IWMP.

- Funds should be released on time and long term funding should be promised for research oriented projects and it should give money for the maintenance of the infrastructure after completion of the project.

- Funds should be released well in-time for booking full expenditure at the end of every financial year. For smooth and rapid function of the works, adequate staff is required and at least 10 per cent of total allocation shall be earmarked for engagement of staff.

- As area is constantly increasing under water logging/salinity in various states heavy machineries are required to reclaim the soils by drainage and sub surface drainage, so special training has to be imparted to technical staff including trench driver, operator, JBC, excavator bulldozer drivers and other staff.

- For the involvement of more farmers for producing the hybrid seed, there should be some mechanism devised in various states for timely disposal of hybrid seed produced by the farmers.

- For induction of more milch animal components, unit cost requires revision as per the prevailing market price. For the development of dairy sector, it is essential to provide interest subvention to the project beneficiaries on the same line as for crop loan to the agri-preneurs.

- Projects of infrastructure development need special attention and centralized funding and Public-Private Partnership mode should be more effective in certain areas for effective implementation. Sufficient time frame should be given for doing developmental work especially in the remote parts of the Himalaya.

- Project work performance evaluation/audit/monitoring should be assigned to academic and research institution or any specialized agency meant for evaluation purpose and also involve scientist of State Agricultural Universities.

- Provision for meeting recurring expenditure may be made and there is a need for enhancing the scope of project from existing conversion of 20 per cent of katcha channel to 40 per cent for better implementation. There shall be provisions made for adequate vehicles for effective implementation, supervision and monitoring.

- RDMIS portal needs some improvement particularly when the project is delayed beyond the phasing period.

**South Region**

- SLSC meeting should be conducted early and funds should be released earlier i.e., in April. This will help in planning and execution of work on time. Field staff should be trained for regular follow-up.

- Fund allocation for the implementation of the agricultural mechanization programme to the Agricultural Engineering Department should be increased to meet out the heavy demand from farmers to mitigate the labour problem prevailing in southern states. This will also eliminate the drudgery of farm operation and reduce the rate of service charged.

- Check dams created under micro/minor irrigation schemes lies in over exploited zone where the ground water was utilized more than 100 per cent of existing source. Hence, it was essential to promote rain water harvesting to recharge the ground water.

- In marketing and post harvest management, separate staffing for operation and maintenance and bringing more arrivals to government regulated markets should be provided.

- For schemes of animal husbandry, it was suggested for extension of duration of sector specific schemes from one year to two years for it involves civil construction works.

- In the case of fisheries, provision of 50 percent of the project cost or actual cost to the beneficiaries if they come forward to meet out the cost from their own sources of income and release of funds in time.

- For creating infrastructure facilities for extension programmes including imparting training and organizing farm school, the proposed project outlay should be sanctioned fully in lump-sum for carrying out the civil works without interruption.

- Simplification of tender process for construction work, continuation of issuing Agro met Advisory bulletins, appointment of regular test engineers for timely execution of project activities, release of fund in right time, cleaning of Nala and opening of drainage to be carried out during the month of April, adoption of single window system for purchase of equipments at the implementing institute or a direct procurement or supply of the needy equipments costing more than Rupees one lakh by the funding agency to avoid delay in paper work, strengthening crop and livestock value chain to improve farmers access to resources, technologies, information and markets, creating awareness among the farmers about importance of technology, financial assistance to carry out short, medium and long term research and giving wide publicity using most of communication methods to attract new focus groups on particular aspects were some of the suggestions given by the implementing agencies in Karnataka for improvement of the project.

- Farmers should be strengthened through financial and technological support from state governments to cultivate fallow land. The farmers' society must be strengthened for marketing of produce, release of fund on right time to complete the project in time, value addition of the portal through internet based community based radio programme, financial support to farmers and mid way correction to the project must be permitted. These are some of the suggestions provided by the Kerala state.

- Budget allocation should be made for construction of godowns in each mandal/blocks, creating awareness among the famers about new methods of cultivation and integrating agriculture with MGNREGA to solve the labour problem.

- Wide popularization of profitable farming systems should be undertaken among small and marginal farmers by way of organizing capacity building programmes. Adequate

budget allocation should be made for the full period of the project to retain supporting staff and for meeting contingent expenses.

- Provisions should be made to reallocate funds for salary/wages of skilled and unskilled manpower to complete the planned activities of the projects, the suggestion came from the state of Goa. Further, timely supply of equipments and funds to complete the projects in time, support to have more green houses and different varieties of seed material should be made available. Coordination of all the allied departments like Animal Husbandry, Water Resources and Co-operatives are required for the success of the projects.

**West and Central Region**

- The implementing agencies suggested that for effective implementation of the projects, timely disbursement of the funds as for the commitment made at the time of approval of the project and periodic monitoring should be done to examine the achievements of the objectives and constraints faced, if any.

- Being Infrastructure development projects, results are far reaching. It requires post implementation project support with regular manpower to achieve full benefits of having developed infrastructure, hence provisions for regular and contractual skilled and technical manpower in project should be allowed so as to meet the targeted goals of the project.

- Provisions for multi utility vehicle for effective management of pre-harvest, post-harvest, markets, storage, demonstration and transfer of technology to reach the targeted goal by reducing the waste of time and cost. High tech testing laboratory for food quality should be developed for testing various processed and value added products at farm level.

- Gestation period for the project may also be allowed for any meaningful result. Transfer of technology and extension activities should be considered as continuous processes. Adequate resources should be earmarked accordingly.

- For animal husbandry related projects such as cattle rearing, the beneficiaries should be effectively taken on board before starting the actual implementation of the project. The project cost and animal cost should be based on the market value and the number of cows should be 50 instead of 100 to increase the effectiveness and efficiency of the project. There is a need to extend the duration of the projects for at least 10 years, as five year duration is very short for indigenous cattle breed improvement programme because of their longer maturity and calving interval.

- Under agricultural mechanization, there should be a provision for purchase and maintenance of advanced equipments and training regarding the use of those equipments. The purchase of components of the project had to be done based on quality than through lowest tendering. Timely and full release of funds should be

done for the better management of the project. Technical and contractual man power should be provided to reach the targeted objectives.

- Bio-pesticides such as Trichoderma, Pseudomonas, Beauveria and Verticillium have been prepared by Central Insecticides Board and Registration Committee (CIB & RC) Faridabad. To avoid contamination, each bio pesticide should be prepared in separate premises. So, the strengthening of bio-lab is necessary.

- When there is a delay in the initiation of the project from the date of submission of the proposal, for the effective implementation, some extra budget should be provided to match up with the increased cost of infrastructure.

- The production oriented projects should be linked with the proper marketing so that the project will be continued in future and utilize the infrastructural facilities created.

- Quality seed is an important aspect for enhancing crop production. Attempts should be made to maintain the purity of the seed through proper testing and storage.

**East and North East Region**

- As there were some problems with the availability of trained manpower, provisions for regular, contractual and skilled manpower should be made for meeting the targeted goals of the projects. Filling up of the vacant positions should be given priority for strengthening the staff position.

- Timely release of grant as per the original proposal will be helpful for implementation of the project as per the original plan.

- Completed projects must be replicated for better outcome as it is very useful for the farming community. Adopted villages must be made as “knowledge resource centre” with frequent visits of technical staff to the place.

- Many other suggestions are as reported in other regions and therefore need not be repeated.

# Chapter 7

## Summary of Findings, Conclusions and Policy Suggestions

### 7.1 Background of the Impact Evaluation Study

National Development Council (NDC) in its meeting on 29th May 2007 strongly felt the need to have a scheme that could congregate all the farming and its allied activities and revive agricultural growth in the country. The result was launching Rashtriya Krishi Vikas Yojana (RKVY) during the 11th Five Year Plan (FYP) by all the states and Union Territories (UTs) of India. It was launched as a special Central Assistance Scheme to incentivize the states to draw up plans for their agriculture sector more comprehensively considering their respective agro-climatic conditions, natural resource base and technology issues and also integrating livestock, poultry and fisheries into the overall agrarian scenario**.** It was designed as a state plan scheme with full flexibility given to states to select projects suitable to their local conditions for accelerating growth in agriculture and allied sectors.

RKVY has two important objectives: First, to incentivize the states and UTs for enhancing agricultural expenditure, and second, to incentivize the states and UTs to generate additional growth in agriculture and allied sectors by better planning and undertaking the suitable growth oriented projects. The RKVY is unique for its ability to not only convergence of several sectors of farming activities but also all agricultural and allied departments and research institutions. Attaining an annual agricultural growth rate of more than 4 per cent was the core objective of the RKVY programme. In order to realize this objective, RKVY was implemented with some broad guidelines from the Planning Commission, with high flexibility including approvals at the level of state governments. The other key feature of RKVY was: the states could avail funding from centre to the extent of 100 per cent to implement programmes in their respective states. However, eligibility of state for seeking fund from the centre for the RKVY programme was contingent upon the states' maintaining or increasing its plan expenditure for agriculture and allied sectors. Preparation of District and State Agricultural Plan was also mandatory for drawing funds.

With these goals and features, RKVY programme was implemented in 28 states and 3 UTs covering 20 sectors during the 11th Five Year Plan. During the plan period, RKVY programme implemented 5749 numbers of projects, programmes and schemes covering all the sectors and sub-sectors. An expenditure of Rs. 27414 crore was incurred by 28 states against proposed or allocated budget of Rs. 37920 crore. Around eight sectors, viz., crop development, micro/minor irrigation, horticulture, animal husbandry, agriculture mechanisation, seed production, innovative programme and natural resource management accounted for more than 75 per cent of the total expenditure distributed across 20 main sectors. Expenditure per project was highest for micro and minor irrigation (Rs. 17.2 crore), followed by agricultural mechanisation (Rs. 9.5 crore) and crop development (Rs. 6.65 crore). Crop development, micro/minor irrigation, horticulture, animal husbandry and agriculture mechanisation were the top five sectors with respect to investment under RKVY programme during the 11th Five year Plan. RKVY scheme played a key role in the growth of agriculture sector while it is difficult to isolate the extent of RKVY's contribution for this growth. Encouraged by positive outcome of the scheme and to fully tap annual growth potential of

agriculture and allied sectors, RKVY programme has been carried on to the 12th Five Year Plan with enhanced allocation of Rs 63246 crore, which is nearly 150 per cent increase over the 11th Plan and 50 per cent of the total allocation of Department of Agriculture during the 12th FYP. This clearly reflects the importance that Government of India (GoI) attaches to RKVY.

The main objective of the Impact Evaluation Study (IES) of RKVY is to examine the extent to which the components and activities under the RKVY have actually met or / are meeting their stated targets (objectives) for improving agricultural productivity, production and enhancing economic conditions of the farmers. The present report which is the secotral report and second in the series of three reports is based on the primary survey data collected from beneficiary farm household and infrastructure/asset beneficiaries collected from all the 28 states and 2 UTs. The sample consists of 8174 beneficiary farmers selected from 171 districts, 353 taluks and 3164 villages. As significant expenditure (30 per cent of the total) was accounted for infrastructure/assets development during the 11th Plan, a suitable number of infrastructure and asset beneficiaries were covered in each state representing various sectors. Detailed information was collected about the socio-economic profile of the farm households, interventions and its costs and subsidies, usage of the intervention/benefit and its impacts on farming communities. Information about the impact of the infrastructure/asset interventions on the project objectives, output and outcome, reasons for delayed implementation, etc., was collected from infrastructure/asset beneficiaries. Information was also collected about the trainings, employment generation, marketing details, constraints faced under RKVY, sources of funds, opinion of beneficiaries about RKVY, changes suggested by beneficiaries and benefits availed under other government schemes by RKVY beneficiaries. As our survey was carried out in the entire country, to keep our analysis comprehensive, we divide the country into four regions, namely North; Central and West; East and North-east and South covering all the 28 states falling in these four regions. In addition, Union Territories, viz., Pondicherry and Andaman Nicobar are also covered in the South region.

## 7.2 Summary of the Findings

### 7.2.1 Socio Economic Profile of the Selected Beneficiary Farmers

The highest numbers of beneficiary surveyed belonged to crop development (35 per cent) which along with seeds covered the maximum beneficiaries at the macro level as well. Agricultural mechanization was the next activity with 21 per cent of the total sample followed by animal husbandry 17 per cent, horticultural infrastructure and horticulture crop development together, 24 per cent and minor and micro irrigation 14 per cent of the total sample. All the above activities were clubbed under major activities. Among the minor activities, fisheries accounted for 7 per cent of our selected sample followed by organic farming and natural resource management (NRM) both 5 per cent each, while the remaining activities like integrated pests management, sericulture and cooperatives and cooperation included less than 1 per cent of the sample.

Household size of the selected households varied from 5.8 members in the southern region to 7.2 in the west and central region and the overall family size was 6.7 members per family. The share of SC and ST households among our selected sample was nearly 30 per cent. All the regions were found having covered SC/STs exceeding 15 per cent of their respective sample size. Among the sample households, illiterate beneficiaries were 17 per cent at the

aggregate. Around 15 per cent beneficiaries were literate up to primary standard, 22 per cent were up to middle and 23 per cent were educated up to secondary level. The beneficiaries who had studied up to higher secondary or +2 were 12 per cent and only around 10 per cent were graduate or above. More than 80 per cent of the beneficiaries had their main occupation as agriculture and allied activities. Only 5 per cent were engaged in self business and 7.5 per cent had their main occupation in the service sector and rest were engaged in other activities. Per household owned and operated area averaged at 6.06 acres and 6.08 acres, respectively where the difference accounted for the land under tenancy.

The main source of irrigation in all the regions was ground water that was fetched either through the open well or by the tube well while surface water accounted for less than one fifth of the area irrigated. At the aggregate, around 64 per cent of beneficiary households operated less than 5 acres per household area and the proportion of area these households cultivated was only 27 per cent. On the other extreme, 13 per cent households operated more than 10 acres per household area and they occupied more than 50 per cent share of the total area. The households operating 5 to 10 acres of land occupied 16 per cent share in the holdings and 22 per cent share in the cultivated area. On average, households reared around one cow, buffalo and sheep/goat, each and the average value of all livestock was Rs 76 thousand per household. The value of farm assets owned per household was that of tractor Rs 71 thousand, followed by cattle shed Rs 32 thousand, tractor implements and electric pump sets Rs 23 thousand each while all other assets were in the range of Rs 5 thousand per household or less than that.

Most of the crops grown by the farmers including that of food grains, oilseeds, commercial crops, horticulture, plantation and other miscellaneous crops were covered under the programme. Thereby, the cropping pattern followed by the selected beneficiaries was not particularly affected by the RKVY programme. Around 63 per cent of the gross cropped area among the selected households was under food grain crops, which is closer to the all India percentage of food grains area. More than 10 per cent cultivated area was under oilseeds, 4 per cent under cotton and sugarcane each and around 13 per cent area was under horticultural crops while rest of around 5 per cent area was under other crops, like fodder, forest species etc. Average household income for the selected beneficiaries was recorded slightly above Rs 2 lakh per annum. The agricultural activities constituted Rs 1.35 lakh that was 2/3$^{rd}$ share of the aggregate income. Allied activities contributed around Rs 30 thousand per annum with a share of less than 15 per cent to the aggregate while non-farm income was slightly above the allied activities, Rs 38 thousand per annum consisting of 19 per cent share in the aggregate income. Comparing the income and employment share of agriculture and non farming activities, it is interesting to note that at the aggregate, share of income from agriculture and allied activities as well as from non-farm activities was closer to their employment share. However, across regions there were wide variations.

Average farm productivity in value terms was highest in the north, Rs 27 thousand per acre compared to Rs 26 thousand in the south, Rs 25 thousand in the west and central and Rs 21 thousand in the east and north-east. In comparison, cost of cultivation was highest in the south Rs 11 thousand per acre, followed by north Rs 10 thousand per acre, west and central Rs 9 thousand per acre and the least Rs 6.5 thousand per acre in the east and north-east region. Thus, although eastern region was least productive among the four regions but it also had lower cost of production thereby the wedge in profitability among eastern and other regions was not as wider as it was in the case of farm productivity. This is visible from the

statistics that indicates per acre profitability of Rs 17 thousand in the north, Rs 16 thousand in the west and central, Rs 15 thousand in the south and slightly less Rs 14 thousand in the east and north-east region. Nevertheless due to lower per acre farm productivity and lower cultivated area, although having lower cost of cultivation, net household income in the east and north-eastern region was almost half that of the country as a whole and slightly above half of southern region and slightly above one third that of north and west and central regions.

### 7.2.2 RKVY Intervention among the Beneficiaries - Major Sectors

Although we surveyed only the beneficiary households under RKVY programme but we observed that out of the selected beneficiaries only around 40 per cent were aware about the RKVY or they had heard about the RKVY programme before accessing the subsidy. Even after accessing the subsidy a clear majority of households did not know that they obtained subsidy under the RKVY programme. In most of the cases, households accessed the concerned departments that provided input or subsidy under RKVY programme through the village or Gram Parcharak (informer). As mentioned above crop development, micro/minor irrigation, horticulture, animal husbandry and agriculture mechanisation were the top five sectors with respect to investment under RKVY programme during the 11$^{th}$ Five year Plan. These sectors are, therefore, classified as major sectors in our analysis. The remaining sectors are classified as minor sectors. We selected beneficiary farmers based on the list provided by various implementing departments whereby emphasis was given to have the due representation of all the activities covered under RKVY in all major and minor sectors.

Among our selected households, 21 per cent availed the benefit under the broad category of mechanisation. The intervention cost for mechanisation per household on average was around Rs 85 thousand out of which subsidy provision under the RKVY programme was around 38 per cent that turns out around Rs 32 thousand per household. Looking at the kind of implements for which subsidy provision was made: the highest numbers of households invested in pump sets in which subsidy was given to around 5 per cent of the selected households, followed by tiller and sprayers around 2.5 per cent households and rotavators around 2 per cent of the selected households invested. The highest amount of subsidy was given for the combine harvester, above Rs 5 lakh and tractor, Rs 1.4 lakh per household. Tiller and harvester received subsidy amount of around Rs 50 thousand per household while rotavator, thresher, seed drill and other sowing, planting and post harvest equipments received subsidy ranging between Rs 20 to 50 thousand per beneficiary household. Although the numbers of households investing in pump sets was highest but the amount of subsidy received was only Rs 12 thousand per household and in the case of sprayers the subsidy amount was only Rs 2 thousand per household.

As against the aggregate average of 21 per cent of the selected households participating in the mechanisation activities, the proportion was highest 27 per cent in the case of south, a little less than that (around 26 per cent) in the west and central, less than 1/5$^{th}$ (only19 per cent) in the east and north east and only 15 percent in the case of north. The subsidy amount given under the programme was also highest in the south, Rs 58 thousand per household, followed by west and central, Rs 25 thousand, north Rs 24.5 thousand and east and north-east Rs 24.3 thousand per household. It was highest 47 percent of the total investment by the households in the west and central, 39 per cent in the south and east and north-east, each and lowest 25 per cent in the north. All the regions recorded above 90 per cent of the equipments in working

conditions. The east and north-east region had more equipment manually driven compared to all other regions where more numbers of equipments were power driven. Looking at the usage of mechanical implements, the imputed value (own plus hired use) per acre works out around Rs 750 for tractor, Rs 1100 for rotavator, Rs 800 for tiller, Rs 350 for cultivator more than Rs 1000 for plough and above Rs 350 for harrow, all purchased by the beneficiaries under the RKVY subsidy programme. On enquiring the farmers of how much productivity has been enhanced with the increased usage of these mechanical implements, a majority of the farmers indicated mostly 10 per cent increase in productivity due to usage of these implements. A majority of farmers averaged around 45 per cent indicated about 10 per cent increase in their productivity after buying the subsidised implements under RKVY programme, e.g. tractor, rotavator, tiller, cultivator, harrow, sprayer and pump set. Around one fourth of the farmers opined that their productivity increased between 10 to 20 percent while only around 15 per cent indicated more than 20 per cent increase in their productivity. On the opposite, around 8 per cent households indicated that these implements did not make any difference in their production or productivity level. We further asked the farmers how these implements have helped them in their agricultural operations. To summarise, a majority of the farmers indicated that the investment in mechanical implements helped their agricultural operations by saving labour, enabling timely sowing and harvesting operations, controlling weed and thus helping them achieving good plant growth rate.

Among all selected households all over the country, around 35 per cent availed benefits under the broad category of crop development. Although programme intervention made under crop development was much higher compared to only 21 per cent of the households in the case of mechanisation, but the scale in terms of size of the intervention was much larger in mechanisation as compared to crop development. The amount of investment by the selected households in the case of crop development was less than Rs 2 thousand per household and the subsidy amount was only Rs 1.5 thousand per beneficiary household although the share of subsidy was as high as 77 per cent of the investment. It is pertinent to note that whereas in the case of mechanisation, households created new assets in order to avail the subsidy benefit but in crop development subsidy was given for the components like seed, fertiliser, bio-fertiliser and micro nutrients most of which were used by the households for growing their usual crops. About farmers' reaction to the impact of use of better quality seed, micro nutrients and bio and plant protection fertiliser, majority of the beneficiary households reported around 10 percent enhancement in their productivity as a result of use of these inputs during the reference period.

In the east and north east region, every alternate household obtained some subsidy under crop development. Although subsidy amount was 90 per cent of the intervention cost but the volume of intervention was only Rs 1614 and the subsidy amount was Rs 1458 per beneficiary household. The subsidy provision made under crop development was highest in the south region, Rs 2431 per beneficiary household where around 24 per cent of the households received subsidy in that region. The subsidy amount was lowest Rs 804 per beneficiary household in the north region where only 18 per cent of the selected households received subsidy under crop development.

According to our field observations, the subsidy scheme under horticulture had two components, first creating infrastructure for horticultural crops like field nursery, poly house, green house etc., and second like crop development, providing seedling material, fertiliser and other nutrients to encourage farmers to grow more horticultural crops. Only 9 per cent of

the selected households participated in horticulture infrastructure building as this activity is more capital intensive, investment under taken per household in horticulture sector was Rs 73 thousand. The amount of subsidy per beneficiary household was Rs 42 thousand that was 57.5 per cent of total investment. Among different types of infrastructure, investment in ripening chambers, pre cooling, grading, packing and processing equipments and refrigerated vans was nominal as only one or two households in the entire sample made investment in these items even though subsidy amount for the intervention was substantial for the participating households. The highest number of households, around 2 per cent of the aggregate participated in field nursery while around 1 per cent households participated in other infrastructure activities, viz., poly house, shade net, green house, plastic crates for transportation and storage bins, each. Investment by the participating households was highest in the green house, the average amount being Rs 2.9 lakh whereby subsidy amount given was Rs 1.3 lakh per beneficiary household. Investment in the poly house was Rs 63 thousand, followed by shade net Rs 56 thousand, plastic crates Rs 38 thousand and field nursery Rs 17 thousand per participatory household. The subsidy given for these items averaged at Rs 47 thousand for shade net, Rs 43 thousand for poly house, Rs 29 thousand for plastic crates and Rs 13 thousand per beneficiary household for creating field nursery. The impact of intervention on fruits and vegetable cultivation and other indicators was around 10 per cent achievement in terms of higher productivity, enhancement in household income and reduction in post harvest losses.

Glancing through the regional details, the highest numbers of households having intervention in horticultural infrastructure was in the east and north-eastern region 11 per cent, followed by south region 9.5 per cent, west 7 per cent and north 6 per cent. The extent of intervention was highest in west region Rs 1.5 lakh, where beneficiary households received subsidy amount of Rs 76 thousand. In the south region intervention amount per household was Rs 1.1 lakh while subsidy amount was Rs 49 thousand per beneficiary household. In the east and north-east region, the intervention was only Rs 33 thousand while subsidy amount was Rs 30 thousand that was almost 90 per cent. In the north region investment amount was Rs 49 thousand where subsidy given averaged at Rs 25 thousand per beneficiary household. Subsidy amount was highest for green house, Rs 5.7 lakh in the south and Rs 2.2 lakh in the north, Rs 1 lakh for shade net and plastic crates, each in the east and Rs 1.2 lakh on poly house in the north.

Around 27 percent farmers who obtained benefit from infrastructure development indicated 10 percent increase in their productivity with the use of field nursery and other facilities like shade net, green house, poly house etc. As infrastructure building in terms of protected cultivation was not taken up at a large scale under RKVY, the extent of productivity increase was not as much as desired from the precision farming. Nevertheless, productivity enhancement up to 30 per cent was indicated by more than 60 per cent participating households while around 25 per cent indicated no change in productivity due to the activities of infrastructure building. However, the households who opined that there was no change in the productivity, a majority of them obtained benefits for storage bins, plastic crates and other such activities that did not have any direct relation with the crop productivity but such activities reduced the cost of production/marketing and also reduced the post harvest losses. Measuring the impact in terms of decrease in cost, increase in income and decrease in post harvest losses, more than 50 per cent beneficiary farmers also expressed an increase in their income and fall in their cultivation cost and post harvest losses up to 20 per cent after the building up of infrastructure for horticultural crops. On the opposite, around 24 per cent

households expressed no change in cost of cultivation and post harvest losses while only 12 per cent households indicated no change in their income after the intervention.

Among the selected households, around 16 per cent also availed benefits for horticulture crop development like seed, fertiliser, bio-fertiliser and micro nutrients for growing horticultural crops. The beneficiary households spent Rs 6661 on seeds and planting material for which they received subsidy amount of Rs 4625 per household. The highest amount of subsidy was given for area based incentives, Rs 16 thousand per beneficiary household and area covered under the same was 1.5 acres per beneficiary household. For other components, viz., fertilizer subsidy per beneficiary household was Rs 3.5 thousand, for bio-fertilizer 2.4 thousand and for micro nutrient Rs 1.5 thousand. The proportion of households participating in horticultural crop development was highest in the case of north and south, where every 5$^{th}$ selected household obtained some subsidy while east region averaged 14 per cent that was close to the aggregate average while west and central region had the least intervention where around 9 per cent of the households obtained subsidy under the programme. Although intervention under horticulture crop development was highest in north and south, but the subsidy amount was lowest, Rs 1 thousand in north and Rs 6 thousand in the south. In the east and north-east region subsidy amount averaged at Rs 7 thousand and Rs 10 thousand in the west and central.

Concluding the horticulture development through RKVY programme, it was observed that in most of the states, the lead was taken for the development of horticulture sector though the programme of National Horticulture Mission as well as Horticulture Programme for the Himalayan states and the North-east. RKVY only supplemented these programmes. In many states, the subsidy programme for horticulture was provided only for the crop development while infrastructure building was done under the NHM programme. Nevertheless, the programme made its desired impact as in the opinion of the farmers there was enhancement in horticulture productivity albeit the increase remained mostly around 10 per cent that further needs to be accelerated in the 12$^{th}$ Plan if horticulture is planned to provide lead in the growth of agriculture sector to achieve 4 per cent growth for the agriculture sector as a whole.

Around 14 per cent of our beneficiary households availed the benefit under the broad category of micro/minor irrigation. The interventions included digging of new wells, deepening of existing wells, energisation of wells, putting up underground plastic pipelines, installing drip/sprinkler system, lift irrigation system and laying of farm ponds for small scale irrigation. On average, the beneficiary households of micro/minor irrigation made per household investment of Rs 86 thousand for which subsidy given averaged at Rs 47 thousand per beneficiary household (around 54 per cent). The households invested Rs 1.4 lakh for bore well for which Rs 1 lakh subsidy was given to 1.3 per cent selected households. Another 3 per cent households installed pump sets for which an average subsidy amount of Rs 30 thousand per beneficiary household was given. The highest 4.3 per cent households invested in farm pond with an average amount of Rs 45 thousand and subsidy amount given for the same was Rs 22 thousand per beneficiary household. Drip irrigation was installed by 2.7 per cent selected households investing Rs 68 thousand per household for which Rs 31 thousand per beneficiary household subsidy was given. Sprinkler irrigation was laid by less than 1 per cent selected households for which average cost borne was Rs 68 thousand and the subsidy amount given for the same was Rs 38 thousand per beneficiary household. In addition to above items, around 2 per cent households were also given substantial amount of Rs 1.2 lakh subsidy for other activities like laying down the proper water pipeline to save and conserve water.

The proportion of households participating in micro/minor irrigation was highest 31 per cent in the case of west and central, followed by north around 13 per cent, south 8 per cent and east and north east around 7 per cent. The subsidy amount given under the programme was highest in the north Rs 74 thousand per household, followed by west and central Rs 45 thousand, south Rs 36 thousand and east and north-east Rs 24 thousand. The average irrigated area per household was around 5 acres varying slightly across regions while impact of installing bore well, pump set and drip and sprinkler irrigation on enhancement in irrigated area by and large ranged between 5 to 20 per cent with lowest increase of around 5 per cent in the east and north-east and highest increase of 20 per cent in the south region.

A majority of the households who obtained subsidy for pump set, farm pond and drip and sprinkler irrigation indicated 10 per cent increase in their productivity after the intervention. Farmers gain from such intervention not only in terms of higher revenue from increased productivity but they also gain from increase in cropping intensity and decrease in their cost of production. As a consequence, net farmers' gain in terms of additional income was found more as farmers indicated around 20 per cent increase in their farm business income due to intervention especially in drilling bore well, pump set and drip and sprinkler irrigation. Around half of the beneficiary farmers indicated 10 per cent increase in their productivity with additional 30 per cent indicating up to 20 per cent increase in productivity. At the aggregate around 85 per cent households benefitting from irrigation intervention were of the view that their productivity increased from less than 10 per cent to up to 30 per cent which is self explanatory in terms of gains of irrigation intervention in raising agricultural production and achieving 4 per cent growth rate for this sector. Further, intervention in micro irrigation like drip and sprinkler led to some tangible benefits to the households as well as to the farming sector as a whole like saving water, fertiliser and manpower. These are advantages not only for the household but also are helpful preserving scare resources like water and are eco friendly and shall be helpful in meeting with the spectre of climate change. Last but not the least, interventions in some of these activities like crop development, horticulture infrastructure and micro/minor irrigation helped farmers changing their cropping pattern moving towards more beneficial crops. Due to crop development around 8 per cent households observed a shift in their cropping pattern. Similarly, due to horticulture infrastructure intervention around 14 per cent households and due to micro and minor irrigation intervention around 10 per cent households shifted their cropping pattern. In all the cases where households shifted their cropping patter observed around 20 to 30 per cent increase in their farm business income.

Under animal husbandry sector there were multiple interventions, e.g., the households were provided subsidy for buying local or hybrid variety of milch and other animals like cow, buffalo, sheep, goat, pig and other poultry animals. A large amount of subsidy was provided to the farmers for establishing modern scientific cattle shed and all animals bought under subsidy scheme were insured for life and there was also subsidy provision for the insurance premium as well as insurance chip. Subsidy was also given for fodder chopper and milking instruments. Many other items were also covered under subsidy scheme like *gobar* gas plant and organic manure unit, subsidy for water tank, for feed and fodder, for water fogger and so on. Around 17 per cent selected households at the aggregate availed subsidy benefits under animal husbandry. Around 3 per cent households invested in buying cows and another 3 per cent buffaloes, 2 per cent bought sheep and goat and another 1 per cent invested in poultry and piggery. Among all the households who bought animals under this programme also obtained subsidy for the insurance premium. Around 2 per cent households invested in

modern cattle shed while few households bought milking instruments, fogger, fodder chopper and some other implements for animal husbandry. The aggregate per household investment in animal husbandry stood at Rs 64 thousand and beneficiary households received subsidy amount of Rs 26 thousand that was around 40 per cent of the total investment.

The numbers of animals for which subsidy was provided averaged at 3 cows, less than 2 buffaloes, 11 sheep and goat, 6 pigs, around 183 poultry chicks while insurance subsidy was given for four animals per beneficiary household. Per household investment was Rs 1 lakh on cows, around 50 thousand on buffaloes, around Rs 30 thousand on sheep and goat, Rs 24 thousand on pigs and Rs 9 thousand on poultry. Further, beneficiary households invested Rs 2.4 lakh on cattle shed, Rs 72 thousand on milking instruments, Rs 32 thousand on foggers, Rs 18 thousand on fodder chopper and Rs 12 thousand on insurance per household. The subsidy share in the above investment was Rs 38 thousand per beneficiary household for cows, Rs 16 thousand for buffaloes, sheep/goat and pigs each, Rs 69 thousand for cattle shed, Rs 39 thousand for milking instruments, Rs 29 thousand for water foggers, Rs 12 thousand for fodder chopper and Rs 6 thousand for insurance premium. Among different regions, the highest percentage of households participated in animal husbandry in south India 25 per cent followed by north India 21 per cent, east and north-east 14.5 per cent and west and central region had the lowest participation of only 10 per cent. The aggregate subsidy amount per beneficiary household was Rs 11 thousand in south, Rs 17 thousand in the west and central, Rs 30 thousand in the east and north-east and Rs 38 thousand in the north.

A majority of the cow and buffalo beneficiaries and those who invested in milking instruments reported an increase in their milk productivity up to 20 per cent as a result of intervention. Similarly, sheep/goat intervention led to 10 per cent hike in meat production for the beneficiaries. However, cattle shed did not lead to higher productivity in milk as was indicated by the modal value but it led to around 10 per cent fall in labour cost as well as it improved animal health given the better feeding and waste drainage facility in the modern cattle shed being promoted under the RKVY programme. Similarly, additional animals bought under the programme led to economies of scale thereby cutting labour cost per head for the beneficiary households. The labour cost reduced up to 10 per cent as a result of intervention under animal husbandry. The intervention in cattle shed, milking instruments, fodder chopper and foggers improved animal health that ultimately leads to longer life for the animal, more productive period, better productivity in milk and outcome of all this is increased household profitability from animal husbandry. Out of around 17 per cent selected households who participated in animal husbandry, around 9 per cent reported having milk production during the reference year. Around 36 per cent of such households indicated around 20 per cent increase in their household income after intervention. Another 29 per cent indicated around 10 per cent increase in their income as a result of intervention while 23 per cent indicated more than 20 per cent increase in household income due to higher milk production. There was also additional household income due to production and sale of manure prepared from animal waste and by selling off animals.

### 7.2.3 RKVY Intervention among the Beneficiaries - Minor Sectors

Based on percentage of beneficiary household and proportionate expenditure on a particular sector, we have classified some the sectors as minor. Accordingly, natural resource management, organic farming and bio-fertilizers, fisheries, IPM, sericulture, cooperatives and cooperation and information technology are classified as the minor sectors. Natural resource

management (NRM) includes two components, viz., watershed development and soil testing. Watershed development interventions included construction of farm ponds/dug wells, diggies, check dams, community tanks, pipe distribution system, nala bunds, etc. Among the selected households, around 5 percent availed these benefits under the broad category of watershed development. The intervention cost per household on average was around Rs 1.5 lakhs out of which subsidy provision under RKVY programmed was around 59 percent that turns out around Rs 90 thousand per household. Highest number of households invested in farm ponds/dug wells (1.4 percent) and diggies (1.1 percent). It is important to note that the investment cost was highest in the case of diggies around Rs 3.7 lakhs of which nearly 50 percent was subsidized. The area treated was also quite significant at 14.8 acres. The average investment cost was also quite high for community tanks (Rs 2.6 lakhs) and check dams (Rs 2.1 lakhs) and interestingly subsidy received was on the higher side i.e., above 95 percent for each. Although 100 percent subsidy was disbursed for land levelling and bunding activities, the average investment cost was relatively low (around Rs 24 thousand and Rs 75 thousand, respectively).

In the southern region, the interventions were primarily in the form of constructing farm ponds/dug wells and diggies. Around 2 percent households were found having availed benefits under watershed development programme. On average the intervention cost per household was around Rs 13 thousand which was completely subsidized under RKVY programme. In the west and central region, 13 percent beneficiary households availed subsidy for various watershed development interventions. The average cost of intervention was around Rs 1.9 lakh of which 58 percent was subsidized. In the east and north-east region, around 2 percent beneficiary households availed subsidy under watershed development programme. The average cost of intervention was around Rs 1 lakh of which 82 percent was subsidized. In the north, around 3 percent of the selected households availed subsidy under watershed development programme. The average cost of intervention was around Rs 1.1 lakh of which 39 percent was subsidized. The beneficiary households were enquired about the implications of watershed development programme on crop area, productivity, cost and income. Majority of them indicated less than 10 percent increase in crop area and productivity. Cost was reported to decrease by less than 10 percent by most of them; while income increased in the range of 10 to 20 percent as indicated by the beneficiary households.

The beneficiary households were enquired regarding testing of soil under RKVY programme. At the aggregate only 0.5 percent of the beneficiary households did soil testing under RKVY programme. In southern region, none of the sample households were found having tested their soil under this scheme. In east and north-east regions, around 1 percent of the beneficiaries did soil testing in different laboratories. The places where soil testing was done included mobile soil testing laboratories, agricultural colleges, agricultural department laboratories and others. In west and central region, Maharashtra was the only state where beneficiaries were found to have tested soil either in mobile testing labs or agricultural department labs. In east and north east, only in the Assam, West Bengal and Mizoram beneficiaries did soil testing primarily in agricultural department labs. In the north, soil testing by beneficiary was observed in Punjab, Himachal Pradesh and Uttar Pradesh. The benefits provided to the households under NRM included application of lime/gypsum, leaching with good water, proper drainage facility, usage of tolerant varieties, application of micronutrients and others. Among the selected households, around 1 percent availed these benefits. The average area treated under this sector was 3.8 acres. The intervention cost on NRM per household was around Rs 22 thousand per household out of which 70 percent was

subsidized. On our enquiry, majority of the farmers reported less than 10 percent decrease in cost and increase in income and productivity due to such interventions. Also, 61 percent of selected households indicated improvement in soil health due to NRM initiatives under RKVY programme.

Our primary survey covered beneficiaries of organic farming in 18 states where intervention were taken up to promote organic farming among farmers. These beneficiaries constituted a little more than 5 per cent of the total sample beneficiaries. Nearly half of the organic farming beneficiaries were located in 4 states belonging to northern state viz., Uttar Pradesh, Uttrakhand, Jammu and Kashmir and Himachal Pradesh. Among 10 types of composting methods, vermi-composting method was found to be the most popular since 56 per cent of the beneficiary farmers followed this method. The pit method was adopted by 30 per cent of the beneficiary farmers. The remaining beneficiary farmers followed other methods like heap method, Japan Method, NADEP method, Gobar gas slurry method and Azolla cultivation. Under organic farming, the interventions were carried out for production of compost, earthworms and slurry. The intervention cost per household ranged between Rs 22 to 25 thousand in the west and central and north regions. Out of the total intervention investment by the beneficiary households averaged at Rs 24 thousand and RKVY met about 57 per cent of that through subsidy at the aggregate. In the west and central region, beneficiaries reported that they used 57 percent of production for their own farms while beneficiaries in the north region reported 62 percent share for own use.

Organic inputs including FYM compost, vermi-compost, bio gas waste, bio fertilizer and green manure were also distributed under RKVY to promote the use of organic inputs. Around 5 per cent of the sample beneficiaries at the aggregate availed the benefits under such interventions. Areas covered under FYM/compost and vermi compost were 2 acres each, while green manures covered an area of 3 acres. A higher proportion of beneficiaries availed vermi-compost for their land (3.6 per cent beneficiaries treated on average compared to around 0.6 per cent or less beneficiaries using FYM compost, bio fertilizers and green manures). Beneficiaries reported a higher average cost for vermi compost at around Rs 4 thousand (with 36 per cent subsidy) than FYM/ compost (only Rs 865 with 50 per cent subsidy), bio-fertilizers (Rs 316 with 100 percent subsidy) and green manures (Rs 1.5 thousand with 35.7 per cent subsidy). The impact of these interventions would take a couple of years to materialize. Hence, the impact on productivity growth as well as cost reduction remained uniformly below 10 per cent in almost all the states. Bio-gas waste intervention showed 10 to 20 per cent increase in productivity and income level. In some states like in Andhra Pradesh, Assam and Haryana 20 to 30 per cent increase in productivity was reported.

Benefits obtained for fishery sector under RKVY programme include; pond construction, repair and renovation, fingerlings/seed distribution, purchase of net/gear/crafts and others and manure concentrates. On average, around 8 percent of the beneficiary availed subsidy under fishery sector. The average intervention cost was around Rs 24 thousand and subsidy component was 46 percent. Highest number of households, around 15 percent availed benefits in the east and north-eastern region, where the average intervention cost was Rs 15 thousand of which Rs 10 thousand approximately was subsidy amount. Majority of the beneficiary in this region availed subsidy for pond construction and subsidy received for pond construction was more than Rs 30 thousand on average. In west and central region, main intervention was related to fingerling/seed distribution and purchase of net/gears/crafts. Highest subsidy of around Rs 25 thousand was received by the southern region which

accounted for an average investment cost of Rs 53 thousand and the benefits were availed by 4 percent sample beneficiary. In this region, highest average cost was incurred for construction of ponds, around Rs 64 thousand and purchase of nets/gears/crafts, around Rs 56 thousand. In the northern region, average cost for pond construction was Rs 1.2 lakh and repair/renovation Rs 50 thousand of which around 25 percent was subsidy in both the cases.

The sericulture interventions were implemented in 14 states. The main intervention was for Disease Free Layings (DFLs) and silkworm rearing houses. Sericulture beneficiaries constituted only 0.72 per cent of total RKVY sample beneficiaries. Out of all the states surveyed only in five states namely Maharashtra, Arunachal Pradesh, Mizoram, Jammu and Kashmir and Uttar Pradesh the surveyed beneficiaries obtained intervention benefits for sericulture. All the beneficiaries received subsidy for DFLs. On average, households were growing one to two rearings per year. For every rearing 100 to 150 DFLs were received by the beneficiary farmers. The numbers of rearings in Maharashtra were 3 to 4 per annum and they received 150 to 600 DFLs per rearing. The value of DFLs received per HH in Maharashtra was much higher than the other states. The beneficiaries of Uttar Pradesh and Arunachal Pradesh were not given any subsidy for DFLs, while other three states received full subsidy for DFLs. The subsidy for construction of silkworm rearing house was more helpful to farmers since it was relatively expensive and not easily affordable for them and RKVY funded for construction of rearing house in all the five states. At the aggregate intervention cost for construction of silkworm rearing house cost was Rs 49 thousand per household. The subsidy proportion varied from 35 per cent in Maharashtra to 91 per cent in Mizoram and at the aggregate subsidy provision averaged at 68 per cent. Maharashtra beneficiaries reported no change in productivity in sericulture after the intervention, while Mizoram beneficiaries reported 30 to 50 per cent jump in cocoon production and income. The remaining three states showed a moderate impact of 10 to 20 per cent in the cocoon production and income.

Our survey also covered those farmers who had become members of some cooperatives or groups with the assistance under RKVY so as to understand the functioning of those groups. This sector covered 0.67 per cent of total sample beneficiaries who were members of one or the other farmers group in their respective states under different names. The farmers' group in Gujarat and Maharashtra extended assistance to farmers by providing tractor and other facilities. Farmers in Jammu & Kashmir availed facility for digging bore wells and installing pump sets. The impact of this sector was measured by additional earnings per household which shows good returns for the farmers although the facility was available only to handful farmers and that also only in few states.

The numbers of projects implemented unde IPM were very small in relation to total number of projects implemented under RKVY programme. The beneficiary survey intended to have representation of beneficiaries from each of IPM methods i.e. mechanical, cultural, chemical and biological for analyzing the impact of each of these methods. However, many states concentrated mainly on training and demonstrations since imparting knowledge through training and demonstration was more imperative for popularizing IPM than monetary assistance to farmers. Due to this reason, survey could identify only few farmers in the state of Bihar who benefited by way of receiving subsidy under IPM sector. These identified beneficiaries formed 0.33 per cent of total sample size of the state. The state provided full subsidy to all its beneficiaries. The average subsidy was highest for chemicals Rs 5600, followed by cultural Rs 3833, biological Rs 2086 and mechanical Rs 2000. The impact of the

programme was not available as the process takes longer time in the conversion into higher productivity and some reduction in cost. Moreover, the sample beneficiary who implemented the same was too small to come out with reasonable outcomes.

To conclude, amongst the minor sectors maximum percentage of sample households availing RKVY benefits were fishery, watershed development and organic farming. Subsidy as a percentage of total investment was found to be ranging from 46 percent to 70 percent. The average intervention cost varied widely from Rs 1.5 lakh per household in the case of watershed and Rs 1.4 lakh per household in the case of sericulture to only Rs 22 thousand for NRM. For fishery and organic farming sectors the investment cost averaged at Rs 24 thousand per household.

### 7.2.4 Other Miscellaneous Achievements of RKVY

In the process of implementation of the program most of the components/sectors played both direct and indirect role in contributing to the overall development of agriculture. In many cases investment put up by the beneficiary households also led to ancillary benefits to the neighboring farmers and agricultural labourers in terms of better information, better access to the machinery and other resources on rental basis, better capacity building of the farmers, better marketing and transportation facilities and at times additional employment to the agricultural wage earners. In our field questionnaire we tried to capture some of these advantages that RKVY programme might have generated in the implementation process.

Various types of trainings organized for the farmers and self-help group (SHG) beneficiaries under RKVY program includes, promotion of mechanization; conservation of soil and other natural resources essential for agriculture; increasing production and productivity, post harvest management of agricultural products, processing of farm products with a view to facilitate their marketing; improvement of income and employment opportunities; effective use of land and other natural resources; encouraging rural youth into various branches of agriculture and allied sectors; updating technical developments and their use in practice; livestock and enterprise development (animal husbandry, dairying and fisheries); fodder development; seed production; integrated pest management; use of organic farming and bio-fertilizers etc. Most of these trainings were undertaken by different sectors in the form of demonstration, field visits, participation in Krishi Melas (exhibitions), exposure visits/study tours and other forms such as classroom instruction, workshop, seminars, conferences etc.

Among our selected beneficiary households, around 22 per cent undertook training across the country. The proportion was highest about 29 per cent in the case of south region and almost equal proportion around 21 per cent in all other regions. On average, these trainings were conducted for 4 days and the duration was highest in the case of north region, around 6 days while the duration was 2 to 3 days in all other regions. The trainings were given in the form of demonstration in 44 per cent cases, field visits in 29 per cent cases and krishi melas in around 10 per cent cases at the aggregate while other forms of training such as workshops, seminar, conference etc., took place in around 18 per cent cases.

Access to mobile phone by the farmers is vital to extend information technology services to farming community. Therefore, in the sample survey we enquired beneficiaries whether they own a mobile phone if yes how did it help them to gather information related to agriculture. Nearly 12 per cent of the beneficiaries at aggregate did not own a mobile and therefore were

not reachable through mobile phone. Highest farmers not having a mobile access were found in the south around 17 per cent and around 14 per cent in the west and central and east and north-east, each and only 6 per cent in the north. The main concern is that the beneficiaries receiving agriculture related information through short messages (SMS) stood only around 8 per cent of beneficiaries owning mobiles. It is interesting to note that no beneficiary in Kerala and Puducherry in southern region, Bihar, Meghalaya and Sikkim in east and north-east received agricultural information though SMS. The beneficiaries receiving agricultural related SMS remained below 10 per cent in as many as 16 states of the country. Very high proportion around 86 per cent at the aggregate who were receiving messages accepted that they were receiving text messages in their local languages. The survey enquired if the farmers were spending for receiving messages. Except for few stray cases, the farmers were receiving these SMS services free of cost.

RKVY had both farm and non-farm activities under agriculture and allied domain to generate employment opportunities in the rural areas in order to increase livelihood, food and nutritional security, reduce the regional disparity and alleviate rural poverty in the country. Under RKVY, many sectors directly or indirectly helped in employment-oriented, additional income generating opportunities at the village level across the country. Some of these activities contributed to bring about quantifiable changes in agricultural production and productivity in terms of educating the farmers, creating awareness and updating farmers about the emergence of new technologies in various fields. Each sector as mentioned above created both farm and non-farm employment but in some cases like agricultural mechanization also introduced labour saving technology. However, in the case of agricultural mechanization, adoption of farm mechanization especially tractor led to increase operational land holdings and thereby resulted in creation of on-farm employment in terms of all agricultural operations.

At the aggregate, all sectors together created an average number of 11 days of additional employment per household constituting 6 days of own and 5 days of hired labour annually. Interestingly, households' opinion about the increase in employment as a result of RKVY intervention was either no change or only 10 per cent increase in employment. One should see these results from the point that RKVY was not an employment generation progrmme and there exists many other programmes of both central and state governments specifically for that purpose in the country. Some of the activities under RKVY were not at all related to employment generation such as seed distribution, crop protection programmes, R&D in agriculture and so on. The regional picture of employment generation shows that south region generated highest number of 19 days of employment consisting of 9 days for family labour and 10 days for the hired labour through the activities of RKVY. In the east and north-eastern region, 11 days in of employment with 5 days of own and 6 days of hired labour was generated. In the west and central region, 10 days with 5 days each for owned and hired labour days per household were generated. The least numbers of days of employment was generated in the north with average of 8 days consisting 4 days each for family and hired labour per household.

A majority of the farmers produce for which RKVY intervention was availed by the beneficiary farmers was sold through village markets that constituted around 37 per cent of the total produce sold followed by private and other channels around 35 per cent and APMC mandis shared only 26 per cent of the produce sold by the beneficiaries. This shows the prevalence of India's long tradition of periodic markets, most of which are held in rural areas.

Most of the small and medium farmers market their farm produce and purchase inputs also from these markets. The same trend was noticed across the sectors also. The highest share of 69 per cent of the output was marketed through dominant intermediaries like private traders, followed by commission agents 18 per cent and government agencies only 12 per cent. The private traders usually act like wholesalers without holding license and they buy from the farmers and sell to the retailers directly. The commission agents facilitate the sales transactions through different auction methods and charge commission from both buyers and sellers.

Under RKVY the beneficiary farmers shared roughly half of the total cost of machinery and equipments, milch animals, etc., and the rest was met by the implementing agencies. The average investment made by the beneficiary farmers to purchase the assets at the aggregate was Rs 30.6 thousand which ranged from Rs 11.7 thousand in the east and north-east region and Rs 43 thousand per beneficiary in the north region. It was observed that the beneficiary households mobilized more than 50 per cent of the funds from non-institutional sources like money lenders, friends and relatives etc., and around one fifth from the institutional sources such as commercial banks and cooperatives and rest of 22 per cent were contributed from their own funds.

In addition to RKVY programmes, there were other Central and Centrally Sponsored Schemes (CCS) as well as state schemes / programmes being implemented simultaneously by the state department of agriculture and line departments. During our field survey, in addition to collecting information related to RKVY programme, we also collected information on subsidy obtained by our beneficiary households from the other programmes in order to see the volume of subsidy obtained from RKVY vis-à-vis other Central or State sponsored programmes. At the aggregate of all India, about 9.5 per cent of the RKVY beneficiaries availed benefits from different CCS and state sponsored scheme in addition to RKVY. The average subsidy received by those households who availed the benefits was Rs 24 thousand per household. This was slightly less than the average amount of subsidy (Rs 29 thousand per household) given under the RKVY programme.

### 7.2.5 Implementation of Infrastructure Projects

Generally, infrastructure projects have a relatively longer duration and higher amount allocated as compared to the normal projects. Therefore, these infrastructure oriented projects under RKVY have been largely implemented by the government departments, State Agricultural Universities, government owned autonomous corporations, bodies and cooperative organisations. The information related to infrastructure projects implemented by various institutions was collected through a survey method. There were 856 filled-in questionnaire received from various institutions across regions in India. The overall share of the filled-in questionnaire received to total number of infrastructure projects during the 11th Plan was 54.0 per cent.

In the west and central region, numbers of infrastructure projects were more or less evenly distributed across implementing institutions. The SAUs/ICAR institutes implemented about 44 per cent of the total projects designed for this region. The state government departments and corporations/boards/cooperatives accounted for about 26 per cent and 30 per cent of the infrastructure projects, respectively implemented in the region. In the north region, state government departments had taken a lead in designing and implementing the infrastructure

projects as in the east and north-east region also. The government departments involved in implementing about 71 projects, while SAUs/ICAR institutes and state corporations/boards accounted for about 18 per cent and 12 per cent of the infrastructure projects, respectively.

Out of total number of projects, 42 per cent were infrastructure oriented and 34 per cent were beneficiary oriented while 24 per cent were both infrastructure and beneficiary oriented. Overall, 66 per cent of the infrastructure projects were of state flagship projects and 34 per cent were national flagship projects. During the 11th Plan Period, various infrastructure projects under RKVY were spread across 21 sectors in different regions of the country. Out of total infrastructure projects, relatively a large number of them were focused on animal husbandry sector. In fact, animal husbandry sector accounted for 23 per cent of the total projects. The second highest number of infrastructure projects were implemented under research 14 per cent followed by horticulture 9.4 per cent, seed 7.9 per cent and fisheries 5.6 per cent. The least number of infrastructure projects were under the cooperative sectors.

The distribution of the infrastructure projects was quite varied across regions by sectors with the highest number of projects implemented in the north region followed by south, east and north east, and west and central region. In the north region, animal husbandry attracted about 30 per cent of the total number of projects. Similarly, in other regions also the animal husbandry sector received relatively a high priority in designing and implementation of the infrastructure projects with 27.3 per cent in west and central, 17.5 per cent in south and 14.4 per cent in east and north east region. Horticulture received the second highest importance in terms of numbers of infrastructure projects implemented in the north region. Seed sector accounted for about 6 per cent of the total numbers of projects. Interestingly, in the south region, a relatively high importance was given to research, which accounted for 28.6 per cent of infrastructure projects. Horticulture sector in the south region attracted about 11.1 per cent of the total projects and marketing and post harvest management about 6.4 per cent of the projects. Agricultural mechanisation also received considerable attention in the south region.

In the west and central region, a relatively large number of projects were implemented under seed sector after animal husbandry. The seed sector accounted for about 18.6 per cent of the total infrastructure projects in this region. Research also received considerable attention with 9.3 per cent of the projects, which were generally implemented by the State Agricultural Universities. Similarly, in the east and north east region, projects related to research accounted for about 13.8 per cent of the infrastructure projects. As expected, fisheries sector attracted about 11.6 per cent of the projects. Horticulture, natural resource management, seed and crop development also received considerable attention for strengthening the infrastructure facilities leading to development of these sectors.

Out of the total number of infrastructure projects launched during the 11th Plan, about 74 per cent of them were completed and 24 per cent were ongoing, 14 projects were abandoned and 4 projects were not implemented. There are various reasons reported by the implementing agencies for delay in execution, non-implementation and abandonment of projects. The development of varieties and hybrids involve considerable amount of time for testing during different seasons and across regions. In fact, testing of varieties at multi-locations for assessing their wide geographical adaptations is an important stage of varietal development. This often results in delay in release of improved varieties with desirable qualities. The delay in completion of the infrastructure projects can also be attributed to various non-technical reasons. Implementing agencies reported delay in release of funds and partial release of

money out of total sanctioned budget as an important reason for non-completion of the projects on time. Looking at the duration of the infrastructure projects, about 40.4 per cent of the projects were of 1.0-1.9 year of duration. About 15.7 per cent of the projects fell under 3.0-3.9 years. Further, nearly 50 projects each had the completion duration of 4.0-4.9 year and more than 5.0 years duration.

Out of 856 reported infrastructure projects, only 502 projects (58.7 per cent) recorded a hundred per cent achievement of objectives and the remaining projects did not fulfil all the proposed objectives. Among the sectors, about 66 project of projects implemented under animal husbandry achieved all the objectives followed by research with 51.2 per cent. About 78 per cent of the infrastructure projects under seed and 45 per cent under horticulture sector recorded fulfilment of all the proposed objectives at all India level. Out of total projects implemented under fisheries, 70.8 per cent achieved all the objectives. Among regions, north registered the highest proportion of projects achieving all the objectives during the project period. Out of total number of projects, 80.4 per cent in north, 38.9 per cent in south, 57.1 per cent in west and central, and 51.9 per cent in east and north-east region achieved a hundred per cent of all the objectives.

The level of utilisation of finances reveals the financial efficiency of the implementing agencies. The expenditure performance of the implementing agencies seems to be impressive, which is evident from the expenditure to release ratio. The overall expenditure to release ratio was 91.5 per cent implying that only 8.5 per cent of the release was not utilised by the implementing agencies. The expenditure to release ratio was recorded the highest in east and north-east with 99.0 per cent followed by 95.3 per cent in west and central, and 94.4 per cent in north region. South region showed a lower expenditure to release ratio at 79.7 per cent, which is due to the fact that about 33 per cent of the infrastructure projects are reported to be ongoing. Expenditure on infrastructure projects was the highest in central and west region with Rs 65,281 lakh followed by north with Rs 63,513 lakh and south with Rs 48,310 lakh. The expenditure in east and north-east region was Rs 32,386 lakh.

Achievement of infrastructure projects can be seen in terms of creation of assets such as establishing mobilising laboratories, pesticide and bio-control laboratories, construction of community irrigation facilities, soil and water conservation structures, construction of shallow wells, bore wells, drains, soil testing laboratories, increase in area under improved varieties and so on. Under these projects, farmers were also trained and built capacity to apply new technologies, given certified seeds, organic inputs, improved breeds of animals, tarpaulins, solar lanterns and similar useful inputs. Outcomes of the projects, as reported by the implementing agencies, among others included increase in productivity of various crops, improved soil fertility, improved water infiltration, increased seed germination, reduced cost of cultivation, improved training facilities, increased milk yield, wool production, increase in youth employment and enhanced farmers' knowledge and skill in doing farming activities.

## 7.3 Constraints Faced and Households' Opinion about RKVY

To understand the complexities involved in RKVY programme and the constraints being faced by the farmers in accessing the programme, we designed our questionnaire with a series of qualitative and quantitative questions about the farmers' views and opinion about the programme and the difficulties faced by them in the implementation of intervention at their farm level. About 7.5 per cent of the beneficiaries/respondents at the aggregate paid an

average amount of bribe of Rs 6711 per beneficiary household to avail the benefits under RKVY. However, among different regions, the highest 15 per cent respondents paid bribe in the north region followed by west and central region around 8 per cent, east and north east region around 5 per cent and south only less than 1 per cent households paid bribe as per the responses recorded from the households. Households' lack of awareness about the RKVY programme was the biggest constraint and the same was also observed by our field team as even though households availed subsidy benefits but they were not aware that the subsidy was given to them under the RKVY programme. Among the other constraints, highest percentage of beneficiaries (38 per cent) quoted that Information about RKVY programme details were not available. Around, 36 per cent quoted that capacity building/technical advice was not provided, around 30 percent opined that contacts details of the department which pay subsidy were not available, another 25 to 30 per cent of the beneficiaries pointed out that procedure for subsidy was very tedious; numbers of documents required for availing subsidy were too many; there was long time-gap between the purchase and receiving the subsidy amount; and subsidy was paid only after the purchase whereas the initial payment remained the highest problem for buying the instrument or investing in the assets as other major important constraints.

Opinion of the beneficiary households were elicited about the usefulness of RKVY programme and its impact in terms of capacity building, improvement in infrastructure facilities, financial assistance to adopt improved technology, diversification of farm activities or facilitating adoption of subsidiary activities to improve household income, etc. More than two third of the beneficiaries reported that provision of subsidies facilitated investment in acquiring farm machinery and equipments, livestock, development of infrastructure, adoption of and diversification of agriculture which otherwise would have been difficult. Provision of subsidy as the best component was elicited by 39 per cent of the beneficiary households in the east and north-east region while more than 80 per cent households in rest of the three regions indicated it as the best component of RKVY programme. About 41 per cent beneficiary households viewed RKVY programme beneficial as it provided financial assistance. Around 10 per cent of the beneficiary households opined that RKVY schemes/programmes facilitated in building infrastructure facilities and the opinion on this aspect varied from 7 per cent of the beneficiaries in the east and north-east region to nearly 15 per cent beneficiaries in the west and central region. The proportion of beneficiaries sharing capacity building varied from 3.5 per cent beneficiaries in the east and north-east to nearly 29 per cent of the beneficiaries in the south region. Little more than 5 per cent of the beneficiary households viewed RKVY programme beneficial to them in other matters.

About infrastructure projects the constraints faced by the implementing agencies while executing the project activities vary by nature of projects and regions. Implementing agencies in the north region reported that there was delay in selection and approval of action plans at SLSC meeting held in the nodal departments. Delay in project approval results in operational difficulties for timely completion of the projects. This leads to delay in the release of funds from the nodal department to the principal investigator/implementing agencies and incidentally it will be released at the fag-end of the year or after completion of the season in case of seasonal experiments. In addition, implementing agencies reported that fund was not released as per the sanction, which affected the execution of targeted activities. Further, nodal department gave priority to line departments in allocation and release of grants. Agricultural Universities were the least important for nodal agency in the sanction and release of funds.

Another important constraint reported by the implementing departments was the shortage of the staff at various levels. It was reported that collaboration and integration of all systems was the biggest challenge and required various experts. Tendering involves the tedious process. Due to adverse environment conditions and remoteness of the places, participation of reputed agencies was very poor and therefore it led to less competition for undertaking works. At times the agencies will not participate in bidding for civil works, which posed as a great hindrance for effective implementation of the infrastructure projects. Selection of beneficiary was a problem for targeted activities like mushroom cultivation where growers were generally small and marginal farmers or landless labourers. It was a challenge for Department of Agriculture to identify new beneficiary and due to non availability of new beneficiaries and poor response from farming community, adoption of latest technology in marketing and handling of produce remained poor.

In the south region, implementing agencies reported delay in release of funds and its release at the end of the financial year, sanction of only 50 percent of the total budget approved by SLSC and non- allocation of fund at the state level for recruitment of staff as major issues for completion of the project on time. Shortage of staff in farms and nurseries, administrative and financial decisions at the institute level were found to be major problems for the implementation of project in an effective way. The preparation and finalisation of tender often leads to delay in purchase of equipments, time and consumption for construction of all the components in the field. Fluctuations in rupee value in the international market also affected the cost of purchase of equipments. Due to delay in the tender process, civil works could not be completed before the end of the project. The inability of most of the selected farmer beneficiaries to contribute their share to avail the benefit from project was an important problem faced in the field. Further, there were also issues related to non co-operation of farmers for site selection to conduct field trials, farmer's unwillingness to follow recommended practices and delay in selection of site for construction of market were the major issues faced while implementing the infrastructure projects.

In the west and central region, the implementing agencies reported that an important constraint faced while dealing with the nodal agency was accessing fund on time. Though the project was approved for a given budget, the fund released during implementation of the project was considerably less than the allocated amount. For projects related to Biotechnological aspects, development of tissue culture involved a protocol of continuous process which required funding on regular basis to meet the expenses towards buying chemicals and other recurring items but the fund released during some years was abruptly stopped. This severely hampered the overall progress of the project. It was reported that there was a delay in the timely completion of the project as the Public Works Department was reluctant to carry out the changes or modifications suggested by the user departments and there was also delay in getting the estimates from public work department for necessary approvals. Implementing agencies also reported the tedious process involved in tendering as equipments/other components of the project had to be done through lowest tender, which often leads to a compromise with the quality. There was a problem in getting contractual trained persons for the follow up of the project activities. Even though, the infrastructure facilities for training and capacity building were established, there was a need for involvement of extension specialists to extend those infrastructural facilities to the farmers through some of the schemes implemented by ATMA and Agricultural departments. It was suggested that to utilise all these facilities on a sustainable manner there was a need for timely release of adequate non-recurring budget at once. The implementing agencies also

reported problems related to non-availability of labour, machineries and materials for civil construction at the project site. Delay in preparation of proposals, approval of loan and construction of field infrastructures were compounded with climatic problems like long dry spell during rainy season, excess rain, fog, scarcity conditions and rise in temperature.

The major constraints reported by the implementing agencies in east and north-east region were delay in release of funds due to some administrative procedures. The implementing agencies also reported non-availability of trained manpower for completing the projects on time. There were sector specific problems reported by the implementing agencies. In case of animal husbandry, procurement of animals from outside the state through surface transport was really a problem as it required support from various agencies like railway department, road transport, police department and sales tax department. The procurement of seed testing laboratory equipments, chemicals and, commissioning and equipping of Walk-in-Germination Chamber and seed storage room to make the seed testing laboratory viable as per the quality standards through tendering process unduly delayed the completion of the works. Moreover, the latest know-how for the technical works was reportedly not readily available for reference and guidance.

## 7.4 Suggestions for the Better Implementation of RKVY Programme

We sought households' suggestion on how to improve the functioning of the RKVY programme to make it more effective. The suggestions varied from 0.5 per cent beneficiaries suggesting supply of quality feed supplement for livestock to 34 per cent of the beneficiary suggesting improvements in capacity building. About 34 per cent of the beneficiary households suggested well formulated training programmes, focused on a single aspect or theme like plant protection, preparation of vermi-compost, improved cultural practices, etc., would make the programme more effective. Similarly, nearly 20 per cent of the beneficiaries suggested to ensure timely availability of subsidy as well as less documentation to avail the subsidy offered under different components of RKVY. There was suggestion for the provision of better quality inputs (14.2 per cent). There were also general suggestions regarding fencing of farms near forest areas, transmission of weather data to the farmers, mobile veterinary clinics, etc., (9.7 per cent). A little more than 8 per cent of the beneficiaries demanded integration of schemes and wider coverage and scope of the schemes like integrating MGNREGA with crop production, crop insurance and credit, post-harvest facilities like cold storage and procurement, animal husbandry and dairy providing better breeds, collection of milk centers, chilling plants, etc. About 7 per cent of the beneficiary households emphasized development of irrigation infrastructure through provision of pump sets, construction of tanks and ponds, availability of electricity/diesel for operating pump sets, flood control measures in chronically flood affected areas. There were few suggestions related to mechanization, access to credit, market facilitation and supply of feed and fodder for dairy animals.

Our suggestions regarding RKVY programme are grouped into 10 broad categories which are described as below:

- Capacity building: conducting training programs for capacity building should be focused on one specific topic instead of covering a plethora of subjects in a single training programme.

- Subsidy related: timely availability, simple procedure of availing subsidy, enhancing the coverage and hike the percentage of subsidy given.
- Production and input related: timely provision of good quality seeds, availability of appropriate and required fertilizers, pesticides and other inputs.
- Irrigation related: provision of pump sets, construction of tanks and ponds, availability of electricity/diesel for operating pump sets, flood control measures in chronically flood affected areas.
- Farm mechanization: availability of farm machineries and equipments to deal with labour problems and ensure timely farm operations.
- Access to credit: simpler documentation and bank procedures to avail loans.
- Market facilitation: provision of timely price information, identifying market and provision of transportation.
- Feed supplements: provision of feed supplements like protein supplements, mineral bricks and good quality cattle feeds, etc., at subsidized rates.
- General suggestions – weather related information, fencing around farm land to prevent entry of wild animals, information on animal diseases, mobile veterinary clinics under RKVY schemes, provision of medicines, continuation of RKVY, organic manure, better infrastructure facilities, soil testing facility, etc.
- Integration of schemes and wider coverage of schemes: integrating various programmes with crop production, crop insurance and credit, post-harvest facilities (cold storage and procurement), animal husbandry and dairy (better breeds, collection centres, chilling plants, etc). There are a numerous parallel CCS schemes running at present like, NHM, NFSM, Bringing GR to Eastern India, Agricultural Mechanization, ISOPOM, Watershed Development, etc., and a few state sponsored programmes like Livestock and Dairy Development, Fisheries, Minor and Micro Irrigation, Distribution of Certified / HYV Seeds, etc. As RKVY provides flexibility in the implementation of the prgrammes by the state, clubbing all programmes together into RKVY will bring in efficiency in the implementation of the programme and raise their effectiveness.

In view of the problems faced while executing the infrastructure projects, project activities, the implementing agencies provided various suggestions for effective implementation. Some suggestions are summarised here for the better implementation of RKVY infrastructure projects.

- Since the RKVY projects are implemented by multi stakeholders, there is a need to have independent Nodal agency which should be fully funded from the scheme.

- The annual action plans should be framed before the on-set of fiscal year and provision should be made for release of total allocated funds to the implementing agencies. Funds may be released directly by the GoI to the Implementing Agency/ Department as is done in case of the other CSS schemes like NHM, NMMI and IWMP.

- Long term funding should be promised for research oriented projects and it should give money for the maintenance of the infrastructure after completion of the project.

- For the involvement of more farmers for producing the hybrid seed, there should be some mechanism devised in various states for timely disposal of hybrid seed produced by the farmers.

- Projects of infrastructure development need special attention and centralized funding and Public-Private Partnership mode should be more effective in certain areas for effective implementation.

- Project work performance evaluation/audit/monitoring should be assigned to academic and research institution or any specialized agency meant for evaluation purpose and also involve scientist of State Agricultural Universities.

- RDMIS portal needs some improvement particularly when the project is delayed beyond the phasing period.

- SLSC meeting should be conducted early and funds should be released earlier i.e., in the month of April. This will help in planning and execution of work on time. Field staff should be trained for regular follow-up.

- Check dams created under micro/minor irrigation schemes lies in over exploited zone where the ground water was utilized more than 100 per cent of existing source. Hence, it is essential to promote rain water harvesting to recharge the ground water.

- For schemes of animal husbandry, it was suggested for extension of duration of sector specific schemes from one year to two years for it involves civil construction works.

- For creating infrastructure facilities for extension programmes including imparting training and organizing farm school, the proposed project outlay should be sanctioned fully in lump-sum for carrying out the civil works without interruption.

- Simplification of tender process for construction work, continuation of issuing Agro Met Advisory bulletins, appointment of regular test engineers for timely execution of project activities, release of fund in right time, adoption of single window system for purchase of equipments at the implementing institute or a direct procurement or supply of the needy equipments costing more than Rs one lakh by the funding agency to avoid delay in paper work, strengthening crop and livestock value chain to improve farmers access to resources, technologies, information and markets, creating awareness among the farmers about importance of technology, financial assistance to carry out research.

- Budget allocation should be made for construction of godowns in each mandal/blocks, creating awareness among the famers about new methods of cultivation and integrating agriculture with MGNREGA to solve the labour problem.

- Provisions for multi utility vehicle for effective management of pre-harvest, post-harvest, markets, storage, demonstration and transfer of technology to reach the targeted goal by reducing the waste of time and cost. High tech testing laboratory for

food quality should be developed for testing various processed and value added products at farm level.

- Gestation period for the project may also be allowed for any meaningful result. Transfer of technology and extension activities should be considered as continuous processes. Adequate resources should be earmarked accordingly.

- For animal husbandry project cost and animal cost should be based on the market value and the number of cows should be 50 instead of 100 to increase the effectiveness and efficiency of the project. There is a need to extend the duration of the projects for at least 10 years, as five year duration is very short for indigenous cattle breed improvement programme because of their longer maturity and calving interval.

- Under agricultural mechanization, there should be a provision for purchase and maintenance of advanced equipments and training regarding the use of those equipments. The purchase of components of the project had to be done based on quality than through lowest tendering. Timely and full release of funds should be done for the better management of the project.

- Bio-pesticides such as Trichoderma, Pseudomonas, Beauveria and Verticillium have been prepared by Central Insecticides Board and Registration Committee (CIB & RC) Faridabad. To avoid contamination, each bio pesticide should be prepared in separate premises. Therefore, the strengthening of bio-lab is necessary.

- When there is a delay in the initiation of the project from the date of submission of the proposal, for the effective implementation, some extra budget should be provided to match up with the increased cost of infrastructure.

- The production oriented projects should be linked with the proper marketing so that the project will be continued in future and utilize the infrastructural facilities created.

- Quality seed is an important aspect for enhancing crop production. Attempts should be made to maintain the purity of the seed through proper testing and storage.

- Completed projects must be replicated for better outcome as it is very useful for the farming community. Adopted villages must be made as “knowledge resource centre” with frequent visits of technical staff to the place.

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## ANNEXURE - 1

## Selected Success Stories of RKVY Interventions

### Rainfed Area Programme in Maharashtra

**Background**

In India, about 57 per cent of the agricultural land is considered as rainfed area and this has high significance to maintain ecology. The rainfed area has potential to contribute significantly to food grain production in the country. Exploitation of different farming systems with due respect to natural resources is the basic objective of this programme. The programme is more suitable for those areas where the cultivable land area is large but are ignored due to lack of water resources.

**Intervention**

In Maharashtra an area of 35815 acres of rainfed land was considered for development under RKVY during 11th Five Year Plan. The task was planned to be accomplished by means of increasing the ground water level, controlling the run-off and by changing cropping system.

**Intervention**

Increase in ground water level between 1 to 2. 5 meters was first and the foremost noticeable impact of RADP in Maharashtra. This was accompanied by more than 20 per cent reduction on run-off. Both these factors contributed for change in cropping pattern by including vegetable, fruits and flower crops under horticulture. Increase of about 20 per cent in cropping intensity was achieved as a natural process. The impact was also noticed in enhanced milk yield up to 5 to 10 liters per animal per day. All these encouraged the rainfed farmers as they could realize an increased income of more than 30 per cent per family per annum.

## Jammu and Kashmir

### Background

The population of Jammu and Kashmir depends mainly agriculture and allied activities. During kharif the farmers cultivate rice, maize, vegetables and pulses as major crops. During rabi, wheat is grown. Saffron cultivation is one distinct feature of this state.

### Intervention

The state has intervened in Agriculture, Horticulture, Animal husbandry and Micro/Minor Irrigation sectors under RKVY during its implementation during the 11th Five Year Plan. Introduction of new hybrid of rice, maize and vegetable was under taken intensively during RKVY period. Implementation of saffron mission is another important intervention of RKVY in Jammu and Kashmir.

### Outcome

One of the major impact of RKVY in J & K is the breaking of seasonal barrier for cultivating vegetables. Now, in Kashmir valley, vegetables are cultivated throughout the year. The other major achievement in this state includes, an increase of 18 percent in paddy production; seed replacement rate increased from around 10 per cent in 2008-09 to more than 25 per cent by the end of 11th FYP; rejuvenation of about 4600 acres of saffron cultivated area; establishment of 9 agri-business centres.

## Orissa

### Background

As an agrarian economy, more than 70 percent of its population is dependent on agriculture**.** The climatic conditions **o**f Orissa support cultivation of several crops. Among them rice, pulses, oil seeds, jute, roselle sugarcane are important crops of the state. Tea, Rubber and Cotton are chief cash crops grown.

### Intervention

Under RKVY programme during the 11th Five Year Plan, Orissa implemented projects under several sectors under the umbrella of RKVY programme. Up scaling of pulses, construction of poly houses development of hybrid sunflower are prominent.

### Outcome

**Poly house**

**Hybrid Sunflower demonstration**

The state achieved highest food grains production during the year 2012-13 for which it was bestowed with Krishi Karman award. Conducted rice intensification (SRI) in 19760 acres of land and 3.03 lakh farmers were benefitted under this programme. Another 91000 acres of area was introduced with hybrid maize covering 1.46 lakh farmers. Similarly popularized hybrid sunflower among 50000 farmers in an area of 30000 acres.

# KERALA

## Background

Kerala state is encountering challenges of stumpy production, soaring cultivable fallow land, shrinking area under traditional food crops and confinement of farmers to mono-cropping system. Dependence of Kerala on other Indian states for its agricultural inputs like fertilizer as well as for electricity is a problem being faced by the state.

## Intervention

The Kerala Agricultural Department took-up the onus of combating deteriorating agricultural scenario in Kerala. The task was gigantic without the involvement of localities, apart from cultivators. The Agriculture Department of Kerala strategically utilized manpower and RKVY funds and found incredible success in their endeavor to restore the confidence of farmers in agriculture and allied activities.

Formation of Food Security Army or Green Cadet Corps (GCC), as a registered body of Kerala Agriculture Department, laid the foundation for development of agriculture and allied activities in Kerala state. All post matriculate students were roped into GCC and were intensively trained for a sufficient period. The training was practical oriented and concentrated on cultivation of crops grown specifically in their respective localities.

Youngsters holding ITI/ITC certificates, in the field of diesel machines or automobile engineering, were lured to undergo an apprenticeship training for a period of 6 months to 1 year. The training was imparted on "operation, maintenance and servicing of agro-machinery" for a period of 6 months to 1 year at Agricultural Research Station Mannuthy. After training, they were designated as Agro-Machinery Operations Service Executives (AMOSE) and were assigned the task of helping farmers in operation of various agricultural machineries. There was no gender discrimination in enrolling AMOSEs or while assigning tasks. For instance: generally, tractor driving is normally a male oriented; but here even females were encouraged to drive tractor.

With this manpower arrangement, the Kerala Agriculture Department set-up its first Agriculture Machinery Operation Service Centre (AMOSC) in Mannuthy Agricultural Research Centre. Initially, the AMOSC purchased machineries worth Rs. 18 lakhs and were placed in a farm machinery yard of 200 $m^2$ created exclusively for this purpose. The funds from RKVY, at this juncture, was of immense use to Agriculture Department of Kerala.

**Outcome**

Nearly 78,000 acres of fallow land brought under cultivation. Converted mono-crop land to double crop land in about 6000 hectares. Increased area under upland cultivation of paddy by 3000 acres during 2008-09. On an average, the productivity of rice has gone up to 3 tons/hectare from 2.24 hectares. This could be attributed to various factors. However, contribution of RKVY is significant. Change in mindset of the farmers and agricultural labourers with respect to farm mechanization is another important impact of mechanization under RKVY programme.

## ANNEXURE - 2

**INSTITUTE FOR SOCIAL AND ECONOMIC CHANGE**
Agricultural development and Rural Transformation Centre
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## EXCERPTS OF INTERACTIVE WORKSHOP ON IMPACT EVALUATION OF RKVY PROGRAMME

### Introduction

As a part of "IMPACT EVALUATION OF RKVY" study undertaken by Agricultural Development and Rural Transformation Centre (ADRTC) of Institute For Social and Economic Change (ISEC), a workshop was organized between the period 10th to 13th February, 2014 at its seminar hall. The workshop endeavored to comprehend various issues pertaining to implementation of RKVY for the purpose of drafting meaningful and feasible policy changes to be incorporated for effective implementation of RKVY during the 12th Five Year Plan.

All the 28 states and 7 union territories were invited, through all modes of communication, well in advance, to participate in the workshop. The workshop had representation from 16 states and two Union Territories (UTs). The remaining 12 states and 5 UTs expressed their inability to attend the workshop for various official reasons. The list of participants attached to state and UTs are appended with this excerpts report.

On the inaugural each day, the regional coordinators of ISEC team, through power point presentation, highlighted qualitative and quantitative findings of the team to the representatives who attended the workshop each day. This was followed by seeking clarifications by ISEC team, on the findings, from concerned representatives. Later, every participated state/UT representatives were provided with an opportunity to present about RKVY for the state /UTs represented by them. All the state and UT representatives actively participated in the interactive discussion undertaken after each presentation.

### Major Issues Raised

During the RKVY workshop concerning the first Impact Assessment report, ISEC received a lengthy set of presentations concerning RKVY implementation by the state officials who were gracious enough to share their experiences utilizing funds under the RKVY programs. This report seeks to discuss what we feel are some major issues faced by the states in both receiving RKVY funds and difficulties states' experienced in the subsequent utilization of funds.

By far the most common complaint against the central RKVY structure is the lack of clarity over the future fund flows. While the state governments are privy to the formula used by the central government to calculate the release of funds to their state, the state governments seems to calculate different figures as compared to the actual funding provided by the central government. As such it has become impossible for the state governments to plan accordingly for future projects, which leads to concerns about the length of project implementation. During the

workshop, many state officials described a reticence to longer term development projects. One of the goals of RKVY is to create sustainable growth in rural areas, which requires long term transformational projects which are currently not being undertaken. Many of the projects being funded under the RKVY scheme are short term in nature or have very localized effects.

Some of the issues brought up during the workshop originate from poor district level planning by the state governments. Before the workshop, ISEC had some evidence of this when looking at preliminary beneficiary surveys. Many of the initial interviews of beneficiaries suggest that not all the funds allocated to the planned project or to planned farm subsidies had been provided. In some cases this difference might be due to costs of implementation which eat into the allocated funds (indeed in areas such as Jammu and Kashmir, terrain has a large effect on implementation costs). However, the difference between funds allocated and funds received by beneficiaries is widespread enough that there is a fair amount of concern as to the utilization of funds at the district level.

Many of the issues described at the district level might also be due to overly complex funding procedures. The descriptions of funding flows to the district level provided by the states' involved numerous agencies, committees and oversight agencies which obviously creates a lot of complexity and possibility for mismanagement of funds. The multi-department nature of many of the distribution plans also clearly hinders the expenditure of funds. Broadly, most states have found it difficult to spend allocated funds consistently aside from infrastructure projects, which affects the following years budget. This becomes a negative cycle since future funding through RKVY is dependent on the states' expenditure of funds on agriculture/rural development projects. The presentations also illuminated that there is a clear difference between allocation and funding. Even after allocation, it can take an extremely long time before funds are actually released to the relevant district level officials for implementation. This time difference seems to be highly variable as well (for instance in Maharashtra the time delay between allocation and the release of funds is only 2 weeks while other states experience month long delays).

Lastly, we would like to bring up some issues of our own regarding the lack of clear private sector initiatives, the use of outside expertise and the lack of long term sustainable development. A long term goal of the RKVY scheme is to induce private investment and development in agriculture and rural Indian economy. Many of the presentations did not touch upon the relationship between the state and the private sector and the use of RKVY funds. In the impact assessment report, we use gross capital formation as one of the few national measures to look at the changes in private investment in agriculture after the implementation of the RKVY scheme. However, it seems that few major RKVY projects directly work with private investors. It was also intimated that there was a lack of clarity as to how private subsidies worked within the RKVY framework.

Links between the state government and outside expertise also seems to be generally lacking, which possibly affect the implementation of more long term sustainability projects. Many of the current projects have limited scope and do not focus on sustainable development, while we feel that the use of outside expertise in the form of university professors and academics who study rural issues in India can help provide a sound basis for future transformative projects under RKVY. However, we also understand that many outside projects influence the spending patterns

through RKVY. For example, in Karnataka there are no major spending initiatives on irrigation works even though the state desperately needs it, but it was intimated that the World Bank projects in the state were picking up the slack. During the workshop, we did not get a sense of why certain only sectors were allocated for RKVY funding and on what basis.

## List of Participants

A. State and Union Territories

| Sl | Name of Participant | Designation | State / Union Territory |
|---|---|---|---|
| Date: 10th February, 2014 | | Region: North | |
| 1 | Mr. Qazi Shauquat Ashraf | Technical Officer | Jammu & Kashmir |
| 2 | Dr. Mukesh Kumar Srivastav | Additional Director | Uttar Pradesh |
| 3 | Mr. S.S. Tomar | RKVY Coordinator | Uttarakhand |
| Date: 11th February, 2014 | | Region: Western and Central | |
| 1 | Mr. Prakash S Rabari | Joint Director (Agri) | Gujarat |
| 2 | Mr. Ashok Kumar Kumhar | Assistant Director | Madhya Pradesh |
| 3 | Mr. Atul B. Nimbarte | Director (Agri. Processing & Planning) | Maharashtra |
| 4 | Mr. Bajirao Chavan | Agriculture Officer | Maharashtra |
| Date: 12th February, 2014 | | Region: South | |
| 1 | Mr. Z. Venkateshwara Rao | Joint Director of Agriculture | Andhra Pradesh |
| 2 | Mr. N.S.Saxena | Consultant RKVY | Andhra Pradesh |
| 3 | Mr. Suresh Kumar, IAS | Executive Director | Tamil Nadu |
| 4 | Mr. M. Mohamed Iqbal | Deputy Director of Agriculture | Tamil Nadu |
| 5 | Mr. Mantu Biswas | Joint Director of Agriculture | Andaman & Nicobar |
| 6 | Mrs. L. Roopa | Deputy Director of Agriculture | Karnataka |
| 7 | Mr. Roy Mathew | Project Economist | Kerala |
| 8 | Mr. A. Jothi Sathianess | Consultant | Kerala |
| 9 | Mr. G. Ravipragasam | Additional Director of Agriculture | Puducherry |
| 10 | Mr. S. Kumaravelu | Agriculture Officer | Puducherry |
| 11 | Mr. T. Anub Kumar | Agriculture Officer | Puducherry |
| 12 | Mr. Srikanth Mone | Joint Director of Agriculture | Goa |
| Date: 13th February, 2014 | | Region: Eastern & North Eastern | |
| 1 | Mr. Narayan Chandra Das | Deputy Director of Agriculture | West Bengal |
| 2 | Mr. Debananda Roy | Assistant Director of Agriculture | West Bengal |
| 3 | Mr. B.K. Dey | Agronomist | Odisha |
| 4 | Mr. Nimain Charan Swain | State Consultant | Odisha |
| 5 | Mr. Ibocha Singh | Nodal Officer | Manipur |
| 6 | Mr. L. Gojendra Singh | Extension Officer | Manipur |
| 7 | Mr. Langstiech | Nodal Officer | Meghalaya |
| 8 | Mr. Victor | Horticulture Development Officer | Meghalaya |
| 9 | Mr. G. Ikuto Zhimomi | Deputy Director of Agriculture | Nagaland |
| 10 | Mr. P. Chetry | Nodal Officer | Mizoram |
| 11 | Mr. Rohmingthnga Colney | Deputy Director (Planning) | Mizoram |

B.ISEC Staff
(All four days)

| Sl | Name of Participant | Designation |
|---|---|---|
| INVITEES / SPEAKERS | | |
| 1. | Dr. Binay Kumar Pattnaik | Director, ISEC |
| 2 | Dr. M. R. Narayana | Professor, ISEC |
| FACULTY | | |
| 1 | Dr. Parmod Kumar | Professor & Head ADRTC |
| 2 | Dr. M. J. Bhende | Adjunct Professor ADRTC |
| 3 | Dr. A.V. Manjunatha | Assistant Professor ADRTC |
| 4 | Dr. Komol Singha | Assistant Professor ADRTC |
| 5 | Dr. K.B. Ramappa | Associate Professor |
| 6 | Dr. P. Thippaiah | Consultant in RKVY |
| 7. | Dr. Elumalai Kannan | Associate Professor |
| Research Assitants | | |
| 1 | Dr. B. N. Manjunatha | Support Staff RKVY |
| 2 | Dr. G. Shivakumar | Support Staff RKVY |
| 3 | Dr. V. Karthick | Support Staff RKVY |
| 4 | Mr. S. Sampath | Support Staff RKVY |
| 5 | Ms. N. Padmavathi | Support Staff RKVY |
| 6 | Mrs. K. M. Prema Kumari | Support Staff RKVY |
| 7 | Dr. Ramachandra | Support Staff RKVY |
| 8 | Miss. Jyoti Upadhyay | Support Staff RKVY |
| 9 | Mr. Keshava Murthy | Support Staff RKVY |
| 10 | Ms. Sneha Mishra | Support Staff RKVY |

## Annexure Tables

Table 2.1A: Details of districts, taluks, villages and households selected

| State | No. of Districts Covered | No. of Taluks covered | No. of Villges Covered | No. of Beneficiaries Covered |
|---|---|---|---|---|
| **South region** | | | | |
| Andhra Pradesh | 5 | 10 | 74 | 250 |
| Goa | 2 | 4 | 60 | 100 |
| Karnataka | 6 | 12 | 137 | 311 |
| Kerala | 5 | 10 | 38 | 250 |
| Tamil Nadu | 6 | 12 | 180 | 300 |
| Puducherry | 2 | 4 | 40 | 100 |
| A & N Islands | 3 | 6 | 68 | 150 |
| **West and Central Region** | | | | |
| Chattishgarh | 5 | 10 | 116 | 250 |
| Gujarat | 8 | 15 | 75 | 422 |
| Madhya Pradesh | 10 | 20 | 191 | 500 |
| Maharashtra | 8 | 15 | 129 | 350 |
| Rajasthan | 7 | 15 | 91 | 358 |
| **East and North East Region** | | | | |
| Arunachal Pradesh | 5 | 17 | 79 | 225 |
| Assam | 6 | 14 | 61 | 209 |
| Bihar | 8 | 16 | 102 | 400 |
| Jharkhand | 5 | 10 | 114 | 250 |
| Manipur | 5 | 17 | 92 | 233 |
| Meghalaya | 4 | 7 | 49 | 124 |
| Mizoram | 6 | 15 | 90 | 243 |
| Nagaland | 5 | 5 | 10 | 169 |
| Orissa | 6 | 12 | 112 | 300 |
| Sikkim | 4 | 8 | 105 | 200 |
| Tripura | 4 | 7 | 107 | 180 |
| West Bengal | 5 | 10 | 95 | 250 |
| **North Region** | | | | |
| Haryana | 5 | 10 | 64 | 250 |
| Himachal Pradesh | 5 | 10 | 120 | 250 |
| Jammu and Kashmir | 5 | 10 | 166 | 250 |
| Punjab | 5 | 10 | 114 | 250 |
| Uttar Pradesh | 16 | 32 | 350 | 800 |
| Uttarakhand | 5 | 10 | 135 | 250 |
| **ALL INDIA** | **171** | **353** | **3164** | **8174** |

Table 2.2A: Sector-wise sample size (No. of beneficiaries)

| State | Agriculture mechanisation | Animal husbandary | Fisheries | Crop development | Horticulture (infrastructure) | Horticulture (crops) | Integrated pest management | Micro / minor irrigation | Natural resource management | Organic farming / bio-fertilizers | Sericulture | Cooperatives and cooperation | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **South** | | | | | | | | | | | | | |
| Andhra Pradesh | 42 | 159 | 1 | 7 | 64 | 153 | 0 | 0 | 0 | 32 | 0 | 17 | 475 |
| Goa | 53 | 2 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 66 |
| Karnataka | 179 | 16 | 0 | 100 | 20 | 16 | 0 | 19 | 26 | 10 | 0 | 8 | 394 |
| Kerala | 17 | 47 | 0 | 70 | 36 | 89 | 0 | 37 | 0 | 0 | 0 | 9 | 305 |
| Tamil Nadu | 76 | 61 | 14 | 97 | 18 | 41 | 0 | 52 | 2 | 9 | 0 | 0 | 370 |
| Puducherry | 6 | 66 | 0 | 21 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 104 |
| A & N Islands | 17 | 21 | 40 | 48 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 128 |
| **West and Central** | | | | | | | | | | | | | |
| Chattishgarh | 87 | 31 | 70 | 9 | 5 | 67 | 0 | 45 | 0 | 25 | 0 | 0 | 339 |
| Gujarat | 225 | 14 | 0 | 107 | 6 | 55 | 0 | 8 | 50 | 0 | 0 | 1 | 466 |
| Madhya Pradesh | 150 | 30 | 0 | 65 | 85 | 28 | 0 | 290 | 1 | 36 | 0 | 5 | 690 |
| Maharashtra | 19 | 81 | 0 | 176 | 10 | 0 | 0 | 113 | 62 | 0 | 8 | 5 | 474 |
| Rajasthan | 13 | 32 | 0 | 210 | 31 | 19 | 0 | 123 | 124 | 0 | 0 | 1 | 553 |
| **East and North-east** | | | | | | | | | | | | | |
| Arunachal Pradesh | 9 | 47 | 1 | 72 | 38 | 30 | 0 | 0 | 0 | 0 | 12 | 0 | 209 |
| Assam | 38 | 7 | 0 | 18 | 14 | 21 | 0 | 19 | 1 | 8 | 0 | 7 | 133 |
| Bihar | 173 | 8 | 0 | 431 | 4 | 14 | 27 | 66 | 0 | 16 | 0 | 0 | 739 |
| Jharkhand | 50 | 174 | 0 | 104 | 15 | 3 | 0 | 22 | 0 | 2 | 0 | 0 | 370 |
| Manipur | 2 | 0 | 30 | 0 | 101 | 96 | 0 | 2 | 1 | 2 | 0 | 0 | 234 |
| Meghalaya | 0 | 0 | 0 | 0 | 14 | 10 | 0 | 5 | 11 | 0 | 0 | 0 | 40 |
| Mizoram | 7 | 56 | 70 | 171 | 45 | 43 | 9 | 29 | 9 | 0 | 20 | 0 | 459 |
| Nagaland | 92 | 0 | 0 | 117 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 228 |
| Orissa | 103 | 11 | 0 | 347 | 24 | 14 | 0 | 42 | 0 | 29 | 0 | 0 | 570 |
| Sikkim | 7 | 10 | 0 | 40 | 49 | 48 | 0 | 1 | 36 | 0 | 0 | 1 | 192 |
| Tripura | 8 | 43 | 0 | 111 | 1 | 60 | 0 | 5 | 0 | 21 | 0 | 0 | 249 |
| West Bengal | 25 | 48 | 195 | 135 | 5 | 33 | 0 | 11 | 0 | 29 | 0 | 32 | 513 |
| **North** | | | | | | | | | | | | | |
| Haryana | 60 | 38 | 0 | 157 | 34 | 22 | 0 | 8 | 7 | 0 | 0 | 0 | 326 |
| Himachal Pradesh | 33 | 10 | 46 | 39 | 12 | 21 | 0 | 34 | 34 | 67 | 0 | 0 | 296 |
| Jammu and Kashmir | 55 | 16 | 13 | 0 | 47 | 156 | 0 | 51 | 18 | 44 | 12 | 1 | 413 |
| Punjab | 9 | 122 | 19 | 77 | 24 | 51 | 0 | 3 | 0 | 1 | 0 | 0 | 306 |
| Uttar Pradesh | 155 | 146 | 99 | 30 | 9 | 56 | 0 | 168 | 0 | 32 | 7 | 6 | 708 |
| Uttarakhand | 0 | 90 | 0 | 62 | 0 | 125 | 0 | 0 | 0 | 53 | 0 | 0 | 330 |

Note: Some beneficiaries are benefitted in more than one sector. Hence, the total may exceed the sample size

Table 2.3A: Age and gender classification of sample beneficiaries (% to sample size)

| State | Age group | | | | Gender | | |
|---|---|---|---|---|---|---|---|
| | Below 40 Years | Between 40 to 60 Years | Above 60 years | Total | Male | Female | Total |
| **South** | | | | | | | |
| Andhra Pradesh | 41.2 | 48.4 | 10.4 | 100.0 | 69.2 | 30.8 | 100.0 |
| Goa | 24.0 | 48.0 | 28.0 | 100.0 | 86.0 | 14.0 | 100.0 |
| Karnataka | 32.2 | 54.0 | 13.8 | 100.0 | 90.0 | 10.0 | 100.0 |
| Kerala | 17.2 | 55.6 | 27.2 | 100.0 | 75.6 | 24.4 | 100.0 |
| Tamil Nadu | 24.0 | 58.0 | 18.0 | 100.0 | 84.7 | 15.3 | 100.0 |
| Puducherry | 38.0 | 54.0 | 8.0 | 100.0 | 72.0 | 28.0 | 100.0 |
| A & N Islands | 21.3 | 56.7 | 22.0 | 100.0 | 87.3 | 12.7 | 100.0 |
| **Central and Western** | | | | | | | |
| Chattishgarh | 29.2 | 56.4 | 14.4 | 100.0 | 87.2 | 12.8 | 100.0 |
| Gujarat | 20.4 | 54.3 | 25.4 | 100.0 | 90.8 | 9.2 | 100.0 |
| Madhya Pradesh | 31.4 | 52.4 | 16.2 | 100.0 | 86.4 | 13.6 | 100.0 |
| Maharashtra | 32.0 | 53.4 | 14.6 | 100.0 | 86.3 | 13.7 | 100.0 |
| Rajasthan | 34.6 | 47.2 | 18.2 | 100.0 | 75.4 | 24.6 | 100.0 |
| **East and North-East** | | | | | | | |
| Arunachal Pradesh | 53.8 | 44.9 | 1.3 | 100.0 | 69.8 | 30.2 | 100.0 |
| Assam | 45.0 | 49.3 | 5.7 | 100.0 | 97.6 | 2.4 | 100.0 |
| Bihar | 37.0 | 46.8 | 16.3 | 100.0 | 92.8 | 7.3 | 100.0 |
| Jharkhand | 58.8 | 34.4 | 6.8 | 100.0 | 83.6 | 16.4 | 100.0 |
| Manipur | 36.9 | 49.4 | 13.7 | 100.0 | 81.1 | 18.9 | 100.0 |
| Meghalaya | 40.3 | 48.4 | 11.3 | 100.0 | 47.6 | 52.4 | 100.0 |
| Mizoram | 21.4 | 62.6 | 16.1 | 100.0 | 84.0 | 16.1 | 100.0 |
| Nagaland | 48.5 | 37.9 | 13.6 | 100.0 | 64.5 | 35.5 | 100.0 |
| Orissa | 36.3 | 47.7 | 16.0 | 100.0 | 92.0 | 8.0 | 100.0 |
| Sikkim | 35.5 | 51.0 | 13.5 | 100.0 | 86.5 | 13.5 | 100.0 |
| Tripura | 40.6 | 47.2 | 12.2 | 100.0 | 85.6 | 14.4 | 100.0 |
| West Bengal | 51.6 | 42.8 | 5.6 | 100.0 | 79.6 | 20.4 | 100.0 |
| **North and North-West** | | | | | | | |
| Haryana | 37.6 | 48.0 | 14.4 | 100.0 | 92.8 | 7.2 | 100.0 |
| Himachal Pradesh | 25.2 | 52.4 | 22.4 | 100.0 | 82.0 | 18.0 | 100.0 |
| Jammu and Kashmir | 28.8 | 53.2 | 18.0 | 100.0 | 97.6 | 2.4 | 100.0 |
| Punjab | 38.4 | 50.0 | 11.6 | 100.0 | 94.0 | 6.0 | 100.0 |
| Uttar Pradesh | 26.8 | 50.6 | 22.6 | 100.0 | 88.3 | 11.8 | 100.0 |
| Uttarakhand | 32.4 | 51.6 | 16.0 | 100.0 | 84.4 | 15.6 | 100.0 |
| **ALL INDIA** | **33.6** | **50.5** | **16.0** | **100.0** | **84.7** | **15.3** | **100.0** |

Table 2.4A: Classification of sample beneficiaries based on caste (% to sample size)

| State | SC | ST | OBC | Others | Total |
|---|---|---|---|---|---|
| **South** | | | | | |
| Andhra Pradesh | 15.2 | 14.8 | 24.0 | 46.0 | 100.0 |
| Goa | 0.0 | 23.0 | 18.0 | 59.0 | 100.0 |
| Karnataka | 6.8 | 9.0 | 39.2 | 45.0 | 100.0 |
| Kerala | 4.0 | 1.6 | 22.0 | 72.4 | 100.0 |
| Tamil Nadu | 8.7 | 1.0 | 54.3 | 36.0 | 100.0 |
| Puducherry | 28.0 | 0.0 | 71.0 | 1.0 | 100.0 |
| A & N Islands | 0.7 | 34.0 | 26.0 | 39.3 | 100.0 |
| **Central and Western** | | | | | |
| Chattishgarh | 10.4 | 33.6 | 38.4 | 17.6 | 100.0 |
| Gujarat | 3.8 | 7.8 | 30.8 | 57.6 | 100.0 |
| Madhya Pradesh | 15.4 | 10.0 | 40.8 | 33.8 | 100.0 |
| Maharashtra | 5.4 | 8.0 | 37.1 | 49.4 | 100.0 |
| Rajasthan | 8.4 | 8.9 | 50.8 | 31.8 | 100.0 |
| **East and North-East** | | | | | |
| Arunachal Pradesh | 1.3 | 96.4 | 0.0 | 2.2 | 100.0 |
| Assam | 14.4 | 10.5 | 12.9 | 62.2 | 100.0 |
| Bihar | 5.3 | 0.5 | 58.5 | 35.8 | 100.0 |
| Jharkhand | 14.8 | 11.6 | 65.6 | 8.0 | 100.0 |
| Manipur | 11.2 | 38.6 | 27.5 | 22.8 | 100.0 |
| Meghalaya | 2.4 | 97.6 | 0.0 | 0.0 | 100.0 |
| Mizoram | 0.4 | 97.1 | 0.0 | 2.5 | 100.0 |
| Nagaland | 0.0 | 100.0 | 0.0 | 0.0 | 100.0 |
| Orissa | 6.3 | 16.0 | 46.7 | 31.0 | 100.0 |
| Sikkim | 3.5 | 49.0 | 42.0 | 5.5 | 100.0 |
| Tripura | 22.8 | 30.6 | 31.7 | 15.0 | 100.0 |
| West Bengal | 43.2 | 5.6 | 24.0 | 27.2 | 100.0 |
| **North and North-West** | | | | | |
| Haryana | 4.0 | 0.0 | 10.8 | 85.2 | 100.0 |
| Himachal Pradesh | 41.2 | 2.4 | 6.0 | 50.4 | 100.0 |
| Jammu and Kashmir | 9.6 | 4.4 | 12.4 | 73.6 | 100.0 |
| Punjab | 3.2 | 0.0 | 13.6 | 83.2 | 100.0 |
| Uttar Pradesh | 3.5 | 12.9 | 14.4 | 69.3 | 100.0 |
| Uttarakhand | 10.0 | 9.2 | 3.6 | 77.2 | 100.0 |
| **ALL INDIA** | **9.6** | **19.8** | **28.5** | **42.1** | **100.0** |

Table 2.5A: Classification of beneficiaries based on education status (% to sample size)

| State | Illiterate | Primary | Middle | Matriculate | Higher Secondary | Degree | Above Degree | Total |
|---|---|---|---|---|---|---|---|---|
| **South** | | | | | | | | |
| Andhra Pradesh | 31.6 | 18.0 | 12.4 | 17.6 | 9.6 | 6.8 | 4.0 | 100.0 |
| Goa | 7.0 | 10.0 | 26.0 | 33.0 | 8.0 | 16.0 | 0.0 | 100.0 |
| Karnataka | 23.2 | 26.7 | 20.3 | 17.0 | 7.7 | 3.2 | 1.9 | 100.0 |
| Kerala | 1.2 | 18.4 | 20.8 | 31.6 | 14.8 | 9.2 | 4.0 | 100.0 |
| Tamil Nadu | 5.3 | 12.3 | 23.0 | 35.3 | 8.0 | 13.0 | 3.0 | 100.0 |
| Puducherry | 9.0 | 9.0 | 7.0 | 40.0 | 21.0 | 11.0 | 3.0 | 100.0 |
| A & N Islands | 16.0 | 16.0 | 30.0 | 30.0 | 5.3 | 2.0 | 0.7 | 100.0 |
| **Central and Western** | | | | | | | | |
| Chattishgarh | 25.6 | 22.4 | 18.0 | 14.8 | 10.0 | 5.6 | 3.6 | 100.0 |
| Gujarat | 17.3 | 19.4 | 22.0 | 21.6 | 11.4 | 7.4 | 1.0 | 100.0 |
| Madhya Pradesh | 19.2 | 18.2 | 23.6 | 13.2 | 14.4 | 7.2 | 4.2 | 100.0 |
| Maharashtra | 12.6 | 19.4 | 20.9 | 24.9 | 11.1 | 10.3 | 0.9 | 100.0 |
| Rajasthan | 27.1 | 19.8 | 17.9 | 16.8 | 9.5 | 7.3 | 1.7 | 100.0 |
| **East and North-East** | | | | | | | | |
| Arunachal Pradesh | 24.0 | 23.6 | 38.7 | 12.0 | 1.8 | 0.0 | 0.0 | 100.0 |
| Assam | 15.3 | 10.5 | 22.0 | 26.8 | 16.8 | 7.7 | 1.0 | 100.0 |
| Bihar | 12.3 | 6.3 | 14.5 | 33.8 | 14.5 | 15.8 | 3.0 | 100.0 |
| Jharkhand | 27.6 | 8.4 | 13.2 | 24.4 | 18.0 | 7.6 | 0.8 | 100.0 |
| Manipur | 7.3 | 10.7 | 25.8 | 21.5 | 13.3 | 16.7 | 4.7 | 100.0 |
| Meghalaya | 20.2 | 25.8 | 30.6 | 15.3 | 3.2 | 3.2 | 1.6 | 100.0 |
| Mizoram | 7.0 | 11.5 | 32.5 | 38.3 | 9.1 | 1.7 | 0.0 | 100.0 |
| Nagaland | 29.6 | 16.0 | 37.9 | 7.1 | 4.7 | 4.7 | 0.0 | 100.0 |
| Orissa | 23.3 | 11.7 | 15.0 | 30.0 | 10.0 | 8.0 | 2.0 | 100.0 |
| Sikkim | 18.5 | 25.5 | 31.5 | 15.5 | 4.5 | 4.0 | 0.5 | 100.0 |
| Tripura | 12.2 | 10.0 | 42.2 | 17.8 | 13.3 | 1.1 | 3.3 | 100.0 |
| West Bengal | 21.2 | 16.0 | 21.6 | 24.0 | 12.4 | 4.8 | 0.0 | 100.0 |
| **North and North-West** | | | | | | | | |
| Haryana | 14.8 | 12.0 | 16.0 | 22.8 | 15.2 | 16.4 | 2.8 | 100.0 |
| Himachal Pradesh | 14.4 | 21.2 | 20.8 | 25.2 | 8.0 | 8.4 | 2.0 | 100.0 |
| Jammu and Kashmir | 20.0 | 7.2 | 23.6 | 32.4 | 8.0 | 6.4 | 2.4 | 100.0 |
| Punjab | 9.2 | 7.2 | 22.0 | 28.8 | 16.0 | 14.8 | 2.0 | 100.0 |
| Uttar Pradesh | 22.1 | 13.9 | 14.7 | 17.4 | 16.5 | 12.5 | 2.9 | 100.0 |
| Uttarakhand | 9.6 | 13.6 | 21.6 | 23.6 | 17.6 | 11.2 | 2.8 | 100.0 |
| **ALL INDIA** | **17.5** | **15.5** | **21.6** | **23.0** | **11.7** | **8.6** | **2.2** | **100.0** |

Table 2.6A: Family size and occupation details of sample beneficiaries

| State | Average Family Size (Nos.) | Occupation of beneficiaries (per cent to total sample size) | | | | |
|---|---|---|---|---|---|---|
| | | Agriculture and allied Activities | Self business | Service | Other activities | Total |
| **South** | | | | | | |
| Andhra Pradesh | 4.5 | 88.0 | 0.8 | 4.4 | 6.8 | 100.0 |
| Goa | 5.8 | 93.0 | 3.0 | 3.0 | 1.0 | 100.0 |
| Karnataka | 6.9 | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 |
| Kerala | 4.6 | 87.2 | 2.4 | 5.2 | 5.2 | 100.0 |
| Tamil Nadu | 5.1 | 99.7 | 0.0 | 0.3 | 0.0 | 100.0 |
| Puducherry | 4.8 | 99.0 | 0.0 | 1.0 | 0.0 | 100.0 |
| A & N Islands | 10.2 | 90.7 | 0.7 | 3.3 | 5.3 | 100.0 |
| **Central and Western** | | | | | | |
| Chattishgarh | 7.5 | 81.6 | 6.0 | 11.2 | 1.2 | 100.0 |
| Gujarat | 6.9 | 95.0 | 0.7 | 3.3 | 1.0 | 100.0 |
| Madhya Pradesh | 7.5 | 81.8 | 6.0 | 11.8 | 0.4 | 100.0 |
| Maharashtra | 6.3 | 86.9 | 3.4 | 9.7 | 0.0 | 100.0 |
| Rajasthan | 7.8 | 98.6 | 0.6 | 0.8 | 0.0 | 100.0 |
| **East and North-East** | | | | | | |
| Arunachal Pradesh | 5.7 | 88.0 | 5.3 | 0.9 | 5.8 | 100.0 |
| Assam | 6.1 | 78.0 | 7.2 | 2.4 | 12.4 | 100.0 |
| Bihar | 8.7 | 86.0 | 7.0 | 7.0 | 0.0 | 100.0 |
| Jharkhand | 7.4 | 67.6 | 2.8 | 4.4 | 25.2 | 100.0 |
| Manipur | 6.1 | 75.1 | 6.0 | 6.9 | 12.0 | 100.0 |
| Meghalaya | 6.5 | 76.6 | 11.3 | 5.7 | 6.5 | 100.0 |
| Mizoram | 5.9 | 74.1 | 9.9 | 11.5 | 4.5 | 100.0 |
| Nagaland | 5.4 | 86.4 | 2.4 | 11.2 | 0.0 | 100.0 |
| Orissa | 6.4 | 66.3 | 10.7 | 7.3 | 15.7 | 100.0 |
| Sikkim | 5.7 | 74.5 | 9.0 | 16.5 | 0.0 | 100.0 |
| Tripura | 4.9 | 77.2 | 5.0 | 12.2 | 5.6 | 100.0 |
| West Bengal | 5.8 | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 |
| **North and North-West** | | | | | | |
| Haryana | 6.8 | 92.4 | 2.8 | 4.4 | 0.4 | 100.0 |
| Himachal Pradesh | 6.0 | 56.4 | 11.2 | 16.4 | 16.0 | 100.0 |
| Jammu and Kashmir | 7.7 | 68.4 | 9.6 | 11.6 | 10.4 | 100.0 |
| Punjab | 6.4 | 93.6 | 1.2 | 4.4 | 0.8 | 100.0 |
| Uttar Pradesh | 8.0 | 81.5 | 3.9 | 8.9 | 5.8 | 100.0 |
| Uttarakhand | 5.9 | 47.6 | 17.6 | 34.0 | 0.8 | 100.0 |
| **ALL INDIA** | **6.7** | **83.2** | **4.8** | **7.5** | **4.5** | **100.0** |

Table 2.7A: Land holding details of sample beneficiaries

| State | Beneficiaries owning Land (%) | Total Owned land area per HH in Acres | Per household operational area in acres | | | Cropping intensity |
|---|---|---|---|---|---|---|
| | | | Irrigated | Un-irrigated | Total | |
| **South** | | | | | | |
| Andhra Pradesh | 87.2 | 7.3 | 5.7 | 2.2 | 7.9 | 1.2 |
| Goa | 94.0 | 10.8 | 5.3 | 5.7 | 11.0 | 1.0 |
| Karnataka | 99.0 | 11.7 | 6.5 | 5.8 | 12.4 | 1.2 |
| Kerala | 94.4 | 1.2 | 1.2 | 0.1 | 1.3 | 1.0 |
| Tamil Nadu | 97.0 | 5.7 | 4.9 | 0.7 | 5.6 | 1.0 |
| Puducherry | 71.0 | 12.3 | 13.2 | 0.0 | 13.2 | 1.8 |
| A & N Islands | 63.3 | 5.1 | 4.5 | 0.5 | 5.0 | 1.1 |
| **Central and Western** | | | | | | |
| Chattishgarh | 94.0 | 5.7 | 5.5 | 0.2 | 5.7 | 1.7 |
| Gujarat | 99.8 | 9.1 | 8.1 | 1.3 | 9.4 | 1.2 |
| Madhya Pradesh | 96.4 | 7.8 | 7.7 | 0.3 | 8.0 | 1.8 |
| Maharashtra | 94.6 | 6.5 | 5.5 | 1.2 | 6.7 | 1.0 |
| Rajasthan | 96.7 | 10.6 | 8.6 | 2.2 | 10.8 | 1.5 |
| **East and North-East** | | | | | | |
| Arunachal Pradesh | 86.7 | 3.1 | 0.8 | 1.1 | 1.9 | 1.0 |
| Assam | 86.1 | 8.8 | 3.8 | 2.4 | 6.2 | 1.0 |
| Bihar | 99.5 | 4.4 | 4.7 | 0.0 | 4.7 | 1.8 |
| Jharkhand | 96.4 | 3.7 | 3.9 | 0.1 | 4.0 | 1.6 |
| Manipur | 96.1 | 4.1 | 1.0 | 1.1 | 2.2 | 1.0 |
| Meghalaya | 67.7 | 2.4 | 0.5 | 0.3 | 0.8 | 1.8 |
| Mizoram | 95.9 | 4.9 | 1.7 | 1.1 | 2.8 | 1.1 |
| Nagaland | 100.0 | 7.3 | 2.7 | 0.4 | 3.0 | 1.0 |
| Orissa | 95.7 | 5.5 | 4.8 | 1.4 | 6.1 | 1.6 |
| Sikkim | 97.5 | 3.7 | 1.2 | 1.2 | 2.4 | 1.5 |
| Tripura | 97.8 | 6.2 | 2.1 | 1.5 | 3.6 | 1.0 |
| West Bengal | 82.8 | 2.4 | 2.2 | 0.1 | 2.4 | 2.1 |
| **North and North-West** | | | | | | |
| Haryana | 97.6 | 8.2 | 11.1 | 0.1 | 11.2 | 1.8 |
| Himachal Pradesh | 99.2 | 2.6 | 1.9 | 0.3 | 2.2 | 1.9 |
| Jammu and Kashmir | 98.0 | 3.9 | 3.1 | 0.7 | 3.8 | 2.0 |
| Punjab | 98.4 | 9.8 | 14.2 | 0.0 | 14.2 | 2.0 |
| Uttar Pradesh | 95.1 | 5.1 | 5.6 | 0.1 | 5.8 | 1.5 |
| Uttarakhand | 99.2 | 1.8 | 1.5 | 0.5 | 1.9 | 2.0 |
| **ALL INDIA** | **6.7** | **83.2** | **4.8** | **7.5** | **4.5** | **100.0** |

Table 2.8A: Sources of Irrigation (% of gross cropped area irrigated)

| States | Open well | | Tube well | | Canal | | Tank | | Others | |
|---|---|---|---|---|---|---|---|---|---|---|
| | No. of Beneficiaries | Area irrigated | No. of Beneficiaries | Area irrigated | No. of Beneficiaries | Area irrigated | No. of Beneficiaries | Area irrigated | No. of Beneficiaries | Area irrigated |
| **South Region** | | | | | | | | | | |
| Andhra Pradesh | 3.7 | 1.9 | 81.6 | 80.4 | 9.0 | 12.8 | 0.2 | 0.1 | 5.4 | 4.8 |
| Goa | 40.7 | 33.5 | 16.9 | 12.9 | 26.5 | 42.1 | 3.7 | 3.7 | 12.2 | 7.8 |
| Karnataka | 14.6 | 8.2 | 46.0 | 40.1 | 33.1 | 44.4 | 0.5 | 0.5 | 5.8 | 6.8 |
| Kerala | 68.6 | 61.7 | 2.2 | 0.7 | 22.7 | 32.9 | 3.8 | 3.6 | 2.7 | 1.0 |
| Tamil Nadu | 51.3 | 59.6 | 35.4 | 31.0 | 12.6 | 9.3 | 0.0 | 0.0 | 0.7 | 0.2 |
| Puducherry | 0.0 | 0.0 | 81.9 | 93.4 | 0.0 | 0.0 | 0.0 | 0.0 | 18.1 | 6.6 |
| A & N Islands | 40.7 | 41.2 | 3.2 | 1.8 | 48.7 | 49.1 | 7.4 | 7.9 | 0.0 | 0.0 |
| **West and Central Region** | | | | | | | | | | |
| Chattishgarh | 16.4 | 12.4 | 52.6 | 57.4 | 26.9 | 26.5 | 1.6 | 0.9 | 2.6 | 2.8 |
| Gujarat | 34.1 | 32.2 | 51.7 | 53.6 | 5.6 | 9.4 | 1.8 | 0.4 | 6.7 | 4.4 |
| Madhya Pradesh | 17.8 | 14.2 | 71.8 | 74.6 | 6.6 | 7.8 | 2.7 | 1.8 | 1.3 | 1.6 |
| Maharashtra | 71.4 | 65.6 | 24.0 | 30.8 | 2.4 | 2.8 | 1.8 | 0.7 | 0.4 | 0.2 |
| Rajasthan | 17.4 | 8.1 | 62.1 | 59.2 | 18.6 | 30.8 | 0.6 | 0.8 | 1.4 | 1.1 |
| **East and North East Region** | | | | | | | | | | |
| Arunachal Pradesh | 0.0 | 0.0 | 1.1 | 1.7 | 9.4 | 16.9 | 0.5 | 0.6 | 89.0 | 80.9 |
| Assam | 3.6 | 2.3 | 8.6 | 6.3 | 4.1 | 1.4 | 3.1 | 1.9 | 80.7 | 88.1 |
| Bihar | 6.4 | 2.9 | 90.1 | 94.7 | 1.0 | 1.4 | 0.0 | 0.0 | 2.5 | 1.0 |
| Jharkhand | 46.6 | 33.9 | 39.6 | 38.0 | 1.3 | 0.7 | 6.9 | 23.5 | 5.6 | 4.0 |
| Manipur | 0.4 | 0.0 | 1.1 | 0.7 | 28.7 | 48.3 | 5.4 | 2.1 | 64.5 | 49.0 |
| Meghalaya | 0.0 | 0.0 | 5.6 | 0.2 | 5.6 | 16.6 | 0.9 | 0.4 | 88.0 | 82.8 |
| Mizoram | 0.4 | 0.5 | 0.6 | 1.3 | 10.8 | 16.3 | 17.1 | 25.5 | 71.0 | 56.5 |
| Nagaland | 0.0 | 0.0 | 0.0 | 0.0 | 50.3 | 61.3 | 0.0 | 0.0 | 49.8 | 38.7 |
| Orissa | 6.7 | 3.5 | 18.1 | 13.3 | 60.3 | 71.7 | 3.3 | 0.5 | 11.6 | 11.0 |
| Sikkim | 3.9 | 9.4 | 0.3 | 0.3 | 6.7 | 11.2 | 55.4 | 70.0 | 33.8 | 9.1 |
| Tripura | 0.0 | 0.0 | 7.5 | 13.4 | 3.4 | 3.4 | 10.2 | 12.0 | 78.9 | 71.3 |
| West Bengal | 11.6 | 12.2 | 62.3 | 61.3 | 8.1 | 8.2 | 14.5 | 15.2 | 3.5 | 3.2 |
| **North Region** | | | | | | | | | | |
| Haryana | 0.1 | 0.0 | 90.8 | 90.8 | 8.4 | 8.0 | 0.6 | 1.2 | 0.1 | 0.0 |
| Himachal Pradesh | 3.9 | 2.8 | 8.6 | 11.9 | 12.6 | 6.9 | 28.9 | 32.3 | 46.0 | 46.2 |
| Jammu and Kashmir | 0.0 | 0.0 | 20.6 | 31.8 | 32.8 | 31.0 | 6.6 | 6.9 | 40.0 | 30.4 |
| Punjab | 0.1 | 0.0 | 91.7 | 90.5 | 8.2 | 9.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| Uttar Pradesh | 0.9 | 0.7 | 87.5 | 80.4 | 11.0 | 18.2 | 0.2 | 0.1 | 0.4 | 0.6 |
| Uttarakhand | 0.0 | 0.0 | 32.4 | 42.4 | 61.7 | 36.4 | 4.2 | 5.5 | 1.7 | 15.8 |
| **ALL INDIA** | **13.5** | **10.8** | **51.1** | **63.1** | **15.6** | **16.9** | **5.6** | **2.9** | **14.3** | **6.3** |

Table 2.9A: Distribution of beneficiaries by farm size holdings

(Number and Area in Percentages)

| States | Without Land | Marginal | | Small | | Medium | | Large | |
|---|---|---|---|---|---|---|---|---|---|
| | | No. | Area | No | Area | No. | Area | No. | Area |
| **South Region** | | | | | | | | | |
| Andhra Pradesh | 10.4 | 20.4 | 4.8 | 26.4 | 15.5 | 24.8 | 28.0 | 18.0 | 51.8 |
| Goa | 4.0 | 32.0 | 4.7 | 20.0 | 7.2 | 16.0 | 11.7 | 28.0 | 76.4 |
| Karnataka | 0.0 | 14.5 | 2.2 | 34.4 | 11.2 | 19.9 | 13.0 | 31.2 | 73.6 |
| Kerala | 5.6 | 83.6 | 63.2 | 8.8 | 24.7 | 2.0 | 12.1 | 0.0 | 0.0 |
| Tamil Nadu | 1.7 | 28.7 | 9.9 | 39.7 | 28.7 | 22.0 | 30.2 | 8.0 | 31.1 |
| Puducherry | 23.0 | 20.0 | 2.9 | 25.0 | 10.6 | 24.0 | 20.4 | 8.0 | 66.2 |
| A & N Islands | 36.0 | 20.7 | 11.8 | 24.7 | 29.3 | 12.0 | 29.8 | 6.7 | 29.1 |
| **West and Central Region** | | | | | | | | | |
| Chattishgarh | 3.6 | 26.4 | 8.1 | 42.8 | 31.5 | 16.0 | 22.6 | 11.2 | 37.9 |
| Gujarat | 0.5 | 12.1 | 2.3 | 26.3 | 10.4 | 31.0 | 24.8 | 30.1 | 62.6 |
| Madhya Pradesh | 3.8 | 17.0 | 3.9 | 38.6 | 19.8 | 21.8 | 22.4 | 18.8 | 53.9 |
| Maharashtra | 7.7 | 23.1 | 6.3 | 32.0 | 20.1 | 18.9 | 22.2 | 18.3 | 51.4 |
| Rajasthan | 3.6 | 21.0 | 3.4 | 19.8 | 7.2 | 19.3 | 13.5 | 36.3 | 76.0 |
| **East and North East Region** | | | | | | | | | |
| Arunachal Pradesh | 14.7 | 73.3 | 75.6 | 12.0 | 24.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| Assam | 23.4 | 17.7 | 5.7 | 19.1 | 13.9 | 27.8 | 40.7 | 12.0 | 39.8 |
| Bihar | 0.3 | 38.3 | 12.7 | 36.3 | 28.9 | 18.0 | 29.5 | 7.3 | 28.9 |
| Jharkhand | 5.2 | 58.8 | 19.5 | 23.6 | 24.6 | 6.8 | 14.7 | 5.6 | 41.3 |
| Manipur | 12.9 | 63.5 | 40.6 | 18.5 | 31.0 | 3.9 | 13.7 | 1.3 | 14.8 |
| Meghalaya | 46.8 | 47.6 | 60.3 | 5.7 | 39.8 | 0.0 | 0.0 | 0.0 | 0.0 |
| Mizoram | 7.4 | 54.7 | 34.9 | 31.3 | 44.2 | 5.8 | 16.2 | 0.8 | 4.7 |
| Nagaland | 0.6 | 55.6 | 33.9 | 35.5 | 44.8 | 8.3 | 21.3 | 0.0 | 0.0 |
| Orissa | 2.0 | 29.3 | 8.4 | 35.0 | 23.8 | 23.0 | 30.2 | 10.7 | 37.6 |
| Sikkim | 2.0 | 73.5 | 42.0 | 19.5 | 31.2 | 4.0 | 13.0 | 1.0 | 13.8 |
| Tripura | 31.1 | 28.9 | 13.1 | 19.4 | 20.8 | 15.0 | 29.4 | 5.6 | 36.7 |
| West Bengal | 20.0 | 60.0 | 44.7 | 14.8 | 26.6 | 3.2 | 13.8 | 2.0 | 14.9 |
| **North Region** | | | | | | | | | |
| Haryana | 0.4 | 17.2 | 2.7 | 24.4 | 8.9 | 26.4 | 19.4 | 31.6 | 69.0 |
| Himachal Pradesh | 0.4 | 72.8 | 38.8 | 19.2 | 32.9 | 6.8 | 21.6 | 0.8 | 6.7 |
| Jammu and Kashmir | 2.0 | 44.8 | 18.7 | 33.2 | 35.1 | 16.4 | 32.1 | 3.6 | 14.2 |
| Punjab | 0.8 | 6.8 | 0.9 | 16.4 | 4.9 | 32.0 | 19.4 | 44.0 | 74.9 |
| Uttar Pradesh | 4.1 | 36.9 | 10.1 | 28.0 | 19.3 | 18.1 | 25.1 | 12.9 | 45.6 |
| Uttarakhand | 1.6 | 79.2 | 43.8 | 13.6 | 24.8 | 4.0 | 14.7 | 1.6 | 16.6 |

Table 2.10A: Livestock holding by sample households (Rs per household)

| | Cow | | Buffalo | | Young stock | | Male Drought | | Sheep | | Goat | | Pig | | Poultry | | Others | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No | Value | No | Value | No | Value | No | Value | No | Value | No | Value | No | Value | No | Value | No | Value | No | Value |
| **South** | | | | | | | | | | | | | | | | | | | | |
| Andhra Pradesh | 1.0 | 22894.0 | 1.1 | 34208.0 | 1.5 | 6588.0 | 0.2 | 4066.0 | 0.3 | 1076.0 | 0.6 | 2100.0 | 0.0 | 0.0 | 1.0 | 171.0 | 0.0 | 0.0 | 5.7 | 71103.0 |
| Goa | 4.8 | 162405.0 | 0.8 | 26270.0 | 2.5 | 7145.0 | 0.5 | 3825.0 | 0.0 | 0.0 | 0.2 | 600.0 | 0.1 | 60.0 | 0.0 | 0.0 | 0.0 | 0.0 | 8.9 | 200305.0 |
| Karnataka | 1.4 | 21119.0 | 0.7 | 12732.0 | 0.7 | 2384.0 | 0.3 | 997.0 | 0.1 | 453.0 | 0.2 | 551.0 | 0.0 | 0.0 | 0.2 | 2.0 | 0.0 | 64.0 | 3.6 | 38302.0 |
| Kerala | 0.3 | 9420.0 | 0.0 | 112.0 | 0.2 | 2138.0 | 0.0 | 280.0 | 0.0 | 217.0 | 0.1 | 544.0 | 0.0 | 0.0 | 0.2 | 45.0 | 0.0 | 0.0 | 0.9 | 12756.0 |
| Tamil Nadu | 2.0 | 37367.0 | 0.1 | 2253.0 | 1.3 | 6015.0 | 0.1 | 1183.0 | 0.7 | 2156.0 | 1.8 | 6523.0 | 0.2 | 333.0 | 3.7 | 833.0 | 0.0 | 0.0 | 9.9 | 56664.0 |
| Puducherry | 2.5 | 63970.0 | 0.0 | 700.0 | 1.3 | 11310.0 | 0.0 | 10.0 | 0.0 | 140.0 | 1.0 | 5250.0 | 0.1 | 10.0 | 0.3 | 56.0 | 0.1 | 0.0 | 5.3 | 81446.0 |
| A & N Islands | 0.5 | 11440.0 | 0.0 | 400.0 | 0.3 | 4272.0 | 0.1 | 480.0 | 0.4 | 2053.0 | 1.1 | 4736.0 | 1.1 | 6351.0 | 11.8 | 2345.0 | 0.9 | 245.0 | 16.2 | 32323.0 |
| **West and Central Region** | | | | | | | | | | | | | | | | | | | | |
| Chattishgarh | 1.9 | 18062.0 | 0.5 | 13206.0 | 1.3 | 3370.0 | 1.0 | 13764.0 | 0.3 | 596.0 | 0.7 | 2084.0 | 0.1 | 185.0 | 0.6 | 369.0 | 0.0 | 6.0 | 6.4 | 51642.0 |
| Gujarat | 1.6 | 45901.0 | 1.3 | 38597.0 | 1.4 | 4867.0 | 0.4 | 5728.0 | 0.1 | 202.0 | 0.0 | 91.0 | 0.1 | 126.0 | 0.4 | 52.0 | 0.2 | 2741.0 | 5.4 | 98305.0 |
| Madhya Pradesh | 1.3 | 6930.0 | 1.1 | 35919.0 | 1.3 | 3623.0 | 0.5 | 4347.0 | 0.0 | 30.0 | 0.9 | 3172.0 | 0.1 | 43.0 | 0.0 | 4.0 | 0.0 | 108.0 | 5.3 | 54176.0 |
| Maharashtra | 1.2 | 20122.0 | 0.7 | 18565.0 | 1.0 | 4613.0 | 0.8 | 16994.0 | 0.6 | 2183.0 | 1.2 | 4493.0 | 0.0 | 1.0 | 6.0 | 2618.0 | 0.0 | 0.0 | 11.3 | 69589.0 |
| Rajasthan | 1.6 | 34039.0 | 1.6 | 56110.0 | 1.4 | 6805.0 | 0.2 | 2256.0 | 0.1 | 137.0 | 0.9 | 3418.0 | 0.0 | 0.0 | 0.1 | 4.0 | 0.0 | 0.0 | 5.8 | 102768.0 |
| **East and North East Region** | | | | | | | | | | | | | | | | | | | | |
| Arunachal Pradesh | 0.2 | 6247.0 | 0.0 | 0.0 | 0.1 | 1329.0 | 0.1 | 3153.0 | 0.1 | 267.0 | 0.5 | 2213.0 | 1.1 | 19013.0 | 2.4 | 2434.0 | 0.1 | 412.0 | 4.6 | 35068.0 |
| Assam | 1.3 | 19124.0 | 0.0 | 670.0 | 0.1 | 1033.0 | 0.1 | 3339.0 | 0.0 | 0.0 | 0.9 | 2701.0 | 0.2 | 1144.0 | 3.2 | 2402.0 | 0.0 | 0.0 | 6.1 | 30413.0 |
| Bihar | 0.9 | 23108.0 | 0.5 | 12961.0 | 0.9 | 5169.0 | 0.2 | 1412.0 | 0.0 | 8.0 | 0.1 | 285.0 | 0.0 | 0.0 | 1.5 | 150.0 | 0.0 | 0.0 | 4.1 | 43092.0 |
| Jharkhand | 2.0 | 54257.0 | 0.1 | 3036.0 | 1.1 | 5644.0 | 0.7 | 6558.0 | 0.0 | 0.0 | 0.9 | 1977.0 | 0.2 | 776.0 | 7.0 | 830.0 | 0.0 | 0.0 | 12.0 | 73078.0 |
| Manipur | 0.4 | 5839.0 | 0.0 | 0.0 | 0.3 | 1296.0 | 0.1 | 2086.0 | 0.1 | 295.0 | 0.0 | 26.0 | 0.6 | 3461.0 | 11.3 | 3085.0 | 1.9 | 337.0 | 14.7 | 16424.0 |
| Meghalaya | 0.8 | 4548.0 | 0.0 | 0.0 | 0.1 | 274.0 | 0.1 | 1315.0 | 0.0 | 0.0 | 0.0 | 65.0 | 1.1 | 6294.0 | 4.2 | 4346.0 | 0.0 | 0.0 | 6.3 | 16842.0 |
| Mizoram | 0.6 | 19549.0 | 0.0 | 257.0 | 0.2 | 4221.0 | 0.0 | 152.0 | 0.0 | 0.0 | 0.6 | 1327.0 | 1.3 | 9317.0 | 5.7 | 4055.0 | 0.2 | 479.0 | 8.6 | 39359.0 |
| Nagaland | 0.4 | 7142.0 | 0.1 | 1811.0 | 0.1 | 982.0 | 0.1 | 2254.0 | 0.0 | 0.0 | 0.5 | 3763.0 | 1.2 | 13205.0 | 7.0 | 1432.0 | 0.0 | 0.0 | 9.3 | 30590.0 |
| Orissa | 1.3 | 18561.0 | 0.0 | 817.0 | 1.0 | 3180.0 | 0.7 | 8953.0 | 0.3 | 543.0 | 1.2 | 3037.0 | 0.1 | 203.0 | 3.7 | 810.0 | 0.7 | 58.0 | 8.9 | 36164.0 |
| Sikkim | 1.4 | 31490.0 | 0.0 | 0.0 | 0.8 | 3545.0 | 0.6 | 4000.0 | 0.0 | 118.0 | 1.6 | 5084.0 | 0.4 | 1493.0 | 4.7 | 1915.0 | 0.0 | 15.0 | 9.4 | 47660.0 |
| Tripura | 0.6 | 8978.0 | 0.0 | 0.0 | 0.2 | 1400.0 | 0.1 | 500.0 | 0.0 | 0.0 | 0.6 | 1507.0 | 0.4 | 2286.0 | 3.5 | 525.0 | 0.0 | 0.0 | 5.3 | 15196.0 |
| West Bengal | 1.1 | 15418.0 | 0.0 | 620.0 | 0.7 | 2143.0 | 0.5 | 6720.0 | 0.0 | 134.0 | 1.2 | 2919.0 | 0.1 | 444.0 | 2.8 | 959.0 | 0.1 | 114.0 | 6.6 | 29471.0 |
| **North Region** | | | | | | | | | | | | | | | | | | | | |
| Haryana | 1.7 | 66732.0 | 2.4 | 97290.0 | 2.2 | 13261.0 | 0.3 | 3944.0 | 0.0 | 0.0 | 0.0 | 40.0 | 0.0 | 72.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.6 | 181339.0 |
| Himachal Pradesh | 1.4 | 21051.0 | 0.4 | 15428.0 | 1.1 | 3792.0 | 0.4 | 2710.0 | 0.3 | 1336.0 | 0.4 | 1350.0 | 0.0 | 216.0 | 1.4 | 710.0 | 0.0 | 0.0 | 5.4 | 46592.0 |
| Jammu and Kashmir | 1.5 | 45538.0 | 0.5 | 17912.0 | 1.5 | 7182.0 | 0.5 | 8704.0 | 2.8 | 10956.0 | 0.7 | 3632.0 | 0.0 | 48.0 | 6.9 | 2196.0 | 1.0 | 1088.0 | 15.4 | 97256.0 |
| Punjab | 8.7 | 420536.0 | 2.9 | 134808.0 | 5.8 | 53888.0 | 0.7 | 9670.0 | 0.1 | 400.0 | 0.4 | 2208.0 | 0.2 | 1800.0 | 0.5 | 113.0 | 1720.0 | 1720.0 | 1739.2 | 625143.0 |
| Uttar Pradesh | 0.6 | 10668.0 | 1.2 | 34691.0 | 1.1 | 6193.0 | 0.3 | 2382.0 | 0.2 | 586.0 | 0.5 | 1515.0 | 0.1 | 191.0 | 0.2 | 69.0 | 0.0 | 0.0 | 4.2 | 56295.0 |
| Uttarakhand | 1.3 | 21546.0 | 0.4 | 9407.0 | 1.2 | 3133.0 | 0.6 | 2173.0 | 0.1 | 312.0 | 1.8 | 8010.0 | 2.0 | 4016.0 | 2.9 | 586.0 | 0.0 | 0.0 | 10.3 | 49183.0 |
| **ALL INDIA** | **1.4** | **37020.0** | **0.7** | **22440.0** | **1.1** | **6021.0** | **0.4** | **4359.0** | **0.2** | **803.0** | **0.7** | **2400.0** | **0.3** | **1780.0** | **2.6** | **907.0** | **52.8** | **282.0** | **60.2** | **76013.0** |

Table 2.11A: Farm assets holding by sample households (Rs per household)

| | Tractor | | Trolley | | Weeder | | Manual / Power Sprayers | | Threshers | | Electrical Pumpsets | | Diesel Pumpsets | | Sprinkler sets / Drip Irrigation Equipments | | Cane Crusher / Agro-processing Equipments | | Rice flour mills | | Fodder Choppers | | Bullock cart | | Farm house (Cattle Shed) | | Others | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | Value (Rs) | No. | Value (Rs) | No. | Value (Rs) | No. | Value (Rs) | No. | Value (Rs) | No. | Value (Rs) | No. | Value (Rs) | No. | Value (Rs) | No. | Value (Rs) | No. | Value (Rs) | No. | Value (Rs) | No. | Value (Rs) | No. | Value (Rs) | No. | Value (Rs) | No. | Value (Rs) |
| | South Region | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Andhra Pradesh | 0.2 | 39384.0 | 0.2 | 14475.0 | 0.0 | 640.0 | 0.5 | 2167.0 | 0.0 | 680.0 | 1.0 | 121064.0 | 0.1 | 1256.0 | 0.3 | 14704.0 | 0.0 | 0.0 | 0.0 | 16.0 | 0.0 | 494.0 | 0.1 | 1412.0 | 0.6 | 23796.0 | 0.1 | 3925.0 | 3.0 | 224013.0 |
| Goa | 0.1 | 23700.0 | 0.1 | 5988.0 | 0.5 | 9190.0 | 0.2 | 2231.0 | 0.0 | 75.0 | 0.4 | 7890.0 | 0.0 | 10.0 | 2.7 | 24285.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 3500.0 | 0.0 | 0.0 | 0.4 | 51950.0 | 0.5 | 29020.0 | 4.9 | 157839.0 |
| Karnataka | 0.4 | 103749.0 | 0.3 | 23090.0 | 0.1 | 920.0 | 0.5 | 4897.0 | 0.1 | 5913.0 | 0.6 | 17322.0 | 0.1 | 2266.0 | 0.6 | 1274.0 | 0.1 | 4920.0 | 0.0 | 0.0 | 0.1 | 577.0 | 0.2 | 3042.0 | 0.1 | 10199.0 | 0.2 | 6476.0 | 3.3 | 184646.0 |
| Kerala | 0.0 | 16.0 | 0.0 | 0.0 | 0.0 | 172.0 | 0.0 | 191.0 | 0.0 | 0.0 | 0.3 | 12960.0 | 0.0 | 295.0 | 0.0 | 60.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 1626.0 | 0.0 | 1665.0 | 0.5 | 16984.0 |
| Tamil Nadu | 0.3 | 84236.0 | 0.1 | 7373.0 | 0.1 | 2127.0 | 0.4 | 1565.0 | 0.0 | 1237.0 | 0.6 | 60537.0 | 0.1 | 2332.0 | 0.3 | 19759.0 | 0.0 | 97.0 | 0.0 | 2333.0 | 0.1 | 729.0 | 0.0 | 200.0 | 0.0 | 7750.0 | 0.1 | 7732.0 | 2.0 | 198005.0 |
| Puducherry | 0.3 | 48950.0 | 0.0 | 700.0 | 0.0 | 0.0 | 0.0 | 860.0 | 0.0 | 0.0 | 0.6 | 61040.0 | 0.0 | 0.0 | 0.0 | 5000.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.6 | 15620.0 | 0.1 | 79300.0 | 1.5 | 211470.0 |
| A & N Islands | 0.2 | 20153.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 318.0 | 0.0 | 1000.0 | 0.4 | 4547.0 | 0.3 | 5763.0 | 0.0 | 47.0 | 0.0 | 0.0 | 0.1 | 1817.0 | 0.0 | 167.0 | 0.0 | 100.0 | 0.2 | 19560.0 | 0.0 | 0.0 | 1.4 | 53471.0 |
| | West and Central Region | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Chattishgarh | 0.2 | 67388.0 | 0.7 | 25214.0 | 7.8 | 1953.0 | 0.3 | 1410.0 | 0.1 | 5100.0 | 0.7 | 14954.0 | 0.3 | 6240.0 | 0.2 | 2440.0 | 0.0 | 40.0 | 0.0 | 216.0 | 0.4 | 2866.0 | 0.2 | 2276.0 | 0.9 | 31344.0 | 0.1 | 366.0 | 11.7 | 161806.0 |
| Gujarat | 0.6 | 199008.0 | 1.0 | 55484.0 | 1.1 | 2907.0 | 0.9 | 102180.0 | 0.4 | 10180.0 | 0.3 | 33959.0 | 0.1 | 366.0 | 0.2 | 4063.0 | 0.6 | 50210.0 | 0.6 | 35382.0 | 0.0 | 71.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.8 | 493811.0 |
| Madhya Pradesh | 0.2 | 64480.0 | 0.5 | 20338.0 | 8.0 | 1227.0 | 0.3 | 243.0 | 0.1 | 7316.0 | 0.7 | 21798.0 | 0.3 | 6257.0 | 0.5 | 6568.0 | 0.0 | 142.0 | 0.0 | 732.0 | 0.4 | 1624.0 | 0.1 | 3169.0 | 0.9 | 33512.0 | 0.1 | 2354.0 | 12.2 | 169761.0 |
| Maharashtra | 0.2 | 63046.0 | 0.4 | 26409.0 | 8.0 | 1544.0 | 0.6 | 1275.0 | 0.0 | 2206.0 | 0.9 | 15670.0 | 0.1 | 1677.0 | 0.6 | 22614.0 | 0.0 | 143.0 | 0.0 | 0.0 | 0.2 | 1288.0 | 0.3 | 5867.0 | 0.8 | 29041.0 | 0.0 | 943.0 | 12.0 | 171722.0 |
| Rajasthan | 0.5 | 176561.0 | 0.9 | 50813.0 | 0.0 | 1511.0 | 0.5 | 4470.0 | 0.1 | 10690.0 | 0.5 | 24651.0 | 0.3 | 7916.0 | 3.0 | 20775.0 | 0.0 | 391.0 | 0.0 | 0.0 | 0.3 | 2469.0 | 0.1 | 865.0 | 0.5 | 23841.0 | 0.1 | 6749.0 | 6.6 | 331702.0 |
| | East and Central Region | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Arunachal Pradesh | 0.0 | 0.0 | 0.0 | 5.0 | 0.0 | 5.0 | 0.2 | 188.0 | 0.0 | 0.0 | 0.0 | 96.0 | 0.0 | 11.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 42.0 | 0.0 | 0.0 | 0.0 | 78.0 | 0.8 | 4514.0 | 0.0 | 0.0 | 1.1 | 4939.0 |
| Assam | 0.0 | 13493.0 | 0.1 | 8725.0 | 0.0 | 10.0 | 0.6 | 1050.0 | 0.0 | 0.0 | 0.1 | 1272.0 | 0.2 | 2632.0 | 0.0 | 33.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 | 0.0 | 971.0 | 0.5 | 10278.0 | 0.0 | 12.0 | 1.6 | 38477.0 |
| Bihar | 0.3 | 88066.0 | 0.6 | 31840.0 | 5.7 | 1659.0 | 0.3 | 792.0 | 0.2 | 7711.0 | 0.2 | 6293.0 | 0.7 | 11725.0 | 0.1 | 1150.0 | 0.1 | 1095.0 | 0.0 | 434.0 | 0.4 | 1829.0 | 0.0 | 60.0 | 0.8 | 29528.0 | 0.0 | 800.0 | 9.4 | 182981.0 |
| Jharkhand | 0.1 | 21620.0 | 0.2 | 8264.0 | 6.5 | 1260.0 | 0.2 | 248.0 | 0.0 | 1024.0 | 0.2 | 2120.0 | 0.4 | 4664.0 | 0.0 | 70.0 | 0.0 | 900.0 | 0.0 | 500.0 | 0.2 | 1392.0 | 0.1 | 972.0 | 0.7 | 14239.0 | 0.0 | 210.0 | 8.5 | 57482.0 |
| Manipur | 0.0 | 2562.0 | 0.1 | 5925.0 | 0.0 | 0.0 | 0.4 | 594.0 | 0.0 | 0.0 | 0.1 | 604.0 | 0.0 | 854.0 | 0.1 | 902.0 | 0.0 | 0.0 | 0.0 | 601.0 | 0.0 | 2.0 | 0.0 | 588.0 | 0.2 | 1656.0 | 0.0 | 1316.0 | 1.0 | 15604.0 |
| Meghalaya | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 198.0 | 0.0 | 0.0 | 0.0 | 690.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 956.0 | 0.0 | 40.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 1884.0 |
| Mizoram | 0.1 | 4997.0 | 0.1 | 1947.0 | 0.1 | 476.0 | 0.5 | 663.0 | 0.0 | 346.0 | 0.1 | 1308.0 | 0.1 | 1811.0 | 0.4 | 3965.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 329.0 | 0.7 | 13637.0 | 0.0 | 1119.0 | 2.0 | 30598.0 |
| Nagaland | 0.0 | 2663.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 437.0 | 0.0 | 0.0 | 0.0 | 27.0 | 0.0 | 562.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 355.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 148.0 | 0.0 | 0.0 | 0.3 | 4191.0 |
| Orissa | 0.2 | 47283.0 | 0.4 | 37017.0 | 6.1 | 1518.0 | 0.3 | 402.0 | 0.1 | 4217.0 | 0.2 | 2876.0 | 0.4 | 4233.0 | 0.2 | 1540.0 | 0.0 | 237.0 | 0.0 | 67.0 | 0.1 | 773.0 | 0.1 | 1003.0 | 0.7 | 19568.0 | 0.1 | 1820.0 | 8.7 | 122555.0 |
| Sikkim | 0.0 | 1825.0 | 0.0 | 250.0 | 7.2 | 1537.0 | 0.2 | 463.0 | 0.0 | 200.0 | 0.0 | 125.0 | 0.0 | 413.0 | 0.2 | 3262.0 | 0.0 | 0.0 | 0.0 | 90.0 | 0.1 | 700.0 | 0.4 | 7630.0 | 0.3 | 7213.0 | 0.0 | 5075.0 | 8.5 | 28782.0 |
| Tripura | 0.0 | 306.0 | 0.0 | 4511.0 | 0.0 | 0.0 | 0.3 | 543.0 | 0.0 | 31.0 | 0.0 | 436.0 | 0.0 | 333.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 222.0 | 0.4 | 6926.0 | 0.0 | 806.0 | 0.9 | 14114.0 |
| West Bengal | 0.0 | 12208.0 | 0.1 | 3536.0 | 4.2 | 659.0 | 0.4 | 772.0 | 0.1 | 944.0 | 0.1 | 5656.0 | 0.5 | 8490.0 | 0.0 | 368.0 | 0.2 | 2394.0 | 0.0 | 12.0 | 0.2 | 876.0 | 0.2 | 2246.0 | 0.8 | 22768.0 | 0.0 | 840.0 | 6.8 | 61768.0 |
| | North Region | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Haryana | 0.6 | 198884.0 | 1.2 | 65340.0 | 6.4 | 27911.0 | 0.6 | 2009.0 | 0.1 | 12176.0 | 0.9 | 63178.0 | 0.4 | 7676.0 | 0.0 | 686.0 | 0.0 | 40.0 | 0.2 | 3516.0 | 0.8 | 6594.0 | 0.1 | 1232.0 | 0.9 | 87998.0 | 0.2 | 3776.0 | 12.4 | 481016.0 |
| Himachal Pradesh | 0.1 | 12732.0 | 0.1 | 6804.0 | 6.7 | 1457.0 | 0.5 | 2120.0 | 0.0 | 812.0 | 0.2 | 8124.0 | 0.0 | 668.0 | 0.1 | 1880.0 | 0.0 | 24.0 | 0.0 | 1228.0 | 0.5 | 3066.0 | 0.0 | 206.0 | 0.9 | 44588.0 | 0.1 | 3041.0 | 9.3 | 86750.0 |
| Jammu and Kashmir | 0.2 | 88800.0 | 0.4 | 19664.0 | 8.5 | 3165.0 | 0.8 | 3248.0 | 0.1 | 4420.0 | 0.4 | 51628.0 | 0.2 | 4148.0 | 0.0 | 240.0 | 0.1 | 3980.0 | 0.0 | 100.0 | 0.5 | 5172.0 | 0.0 | 820.0 | 1.1 | 71660.0 | 0.0 | 1908.0 | 12.5 | 258952.0 |
| Punjab | 0.9 | 283600.0 | 1.7 | 121370.0 | 10.5 | 10622.0 | 1.2 | 4600.0 | 0.2 | 16210.0 | 1.1 | 110540.0 | 0.6 | 11742.0 | 0.0 | 168.0 | 0.1 | 4120.0 | 0.0 | 828.0 | 1.0 | 18091.0 | 0.3 | 3735.0 | 1.0 | 281868.0 | 0.0 | 10620.0 | 18.5 | 878113.0 |
| Uttar Pradesh | 0.3 | 86532.0 | 0.4 | 23876.0 | 4.6 | 1155.0 | 0.3 | 931.0 | 0.2 | 6402.0 | 0.3 | 17913.0 | 0.5 | 9765.0 | 0.0 | 215.0 | 0.1 | 2535.0 | 0.0 | 2078.0 | 0.8 | 3439.0 | 0.1 | 1727.0 | 0.9 | 35948.0 | 0.0 | 1441.0 | 8.6 | 193955.0 |
| Uttarakhand | 0.1 | 24480.0 | 0.1 | 13722.0 | 7.6 | 947.0 | 1.1 | 314.0 | 0.0 | 472.0 | 0.0 | 809.0 | 0.0 | 292.0 | 0.0 | 1760.0 | 0.0 | 0.0 | 0.0 | 140.0 | 0.4 | 2086.0 | 0.0 | 195.0 | 1.0 | 50900.0 | 0.1 | 18.0 | 10.5 | 96134.0 |
| **NORTH TOTAL** | **0.4** | **107975.0** | **0.6** | **36988.0** | **6.7** | **5829.0** | **0.6** | **1862.0** | **0.1** | **6655.0** | **0.4** | **35561.0** | **0.3** | **6802.0** | **0.0** | **661.0** | **0.1** | **1985.0** | **0.1** | **1520.0** | **0.7** | **5612.0** | **0.1** | **1428.0** | **0.9** | **79518.0** | **0.1** | **2924.0** | **11.1** | **295320.0** |
| **ALL INDIA** | **0.2** | **71047.0** | **0.4** | **23019.0** | **3.8** | **2380.0** | **0.5** | **6596.0** | **0.1** | **4290.0** | **0.4** | **22876.0** | **0.2** | **4348.0** | **0.3** | **4665.0** | **0.1** | **3491.0** | **0.1** | **2446.0** | **0.3** | **2076.0** | **0.1** | **1462.0** | **0.6** | **32341.0** | **0.1** | **3602.0** | **7.1** | **184639.0** |

Table 2.12A: Household income derived from different sources

| | Agricultural activities | | Allied activities | | Non-farm activities | | Aggregate all sources |
|---|---|---|---|---|---|---|---|
| State | Rs per hh | % share in aggregate | Rs per hh | % share in aggregate | Rs per hh | % share in aggregate | Rs per hh |
| **South** | | | | | | | |
| Andhra Pradesh | 110900 | (56.0) | 39670 | (20.0) | 47614 | (24.0) | 198184 |
| Goa | 127915 | (45.5) | 67866 | (24.2) | 85234 | (30.3) | 281015 |
| Karnataka | 209189 | (97.7) | 976 | (0.5) | 3925 | (1.8) | 214090 |
| Kerala | 46919 | (64.4) | 5911 | (8.1) | 20042 | (27.5) | 72872 |
| Tamil Nadu | 92382 | (72.1) | 24479 | (19.1) | 11309 | (8.8) | 128170 |
| Puducherry | 282040 | (72.2) | 63693 | (16.3) | 44648 | (11.4) | 390381 |
| A & N Islands | 35594 | (34.2) | 39740 | (38.2) | 28782 | (27.6) | 104116 |
| **West and Central** | | | | | | | |
| Chattishgarh | 94983 | (60.8) | 32064 | (20.5) | 29079 | (18.6) | 156126 |
| Gujarat | 198089 | (71.6) | 48869 | (17.7) | 29701 | (10.7) | 276659 |
| Madhya Pradesh | 162743 | (78.0) | 9676 | (4.6) | 36195 | (17.4) | 208614 |
| Maharashtra | 154825 | (78.1) | 10663 | (5.4) | 32831 | (16.6) | 198319 |
| Rajasthan | 302964 | (85.5) | 33723 | (9.5) | 17756 | (5.0) | 354443 |
| **East and North-East** | | | | | | | |
| Arunachal Pradesh | 18988 | (37.8) | 15626 | (31.1) | 15662 | (31.2) | 50276 |
| Assam | 16869 | (46.9) | 7628 | (21.2) | 11456 | (31.9) | 35953 |
| Bihar | 88339 | (63.0) | 7078 | (5.0) | 44753 | (31.9) | 140170 |
| Jharkhand | 44303 | (37.3) | 37953 | (32.0) | 36513 | (30.7) | 118769 |
| Manipur | 21246 | (25.8) | 11848 | (14.4) | 49337 | (59.9) | 82431 |
| Meghalaya | 6957 | (18.0) | 8831 | (22.9) | 22781 | (59.1) | 38569 |
| Mizoram | 234282 | (83.1) | 11708 | (4.2) | 35917 | (12.7) | 281907 |
| Nagaland | 29257 | (39.5) | 2722 | (3.7) | 42036 | (56.8) | 74015 |
| Orissa | 115711 | (65.4) | 11631 | (6.6) | 49702 | (28.1) | 177044 |
| Sikkim | 62226 | (37.9) | 35140 | (21.4) | 66994 | (40.8) | 164360 |
| Tripura | 39922 | (57.0) | 24545 | (35.0) | 5597 | (8.0) | 70064 |
| West Bengal | 55546 | (37.7) | 38752 | (26.3) | 53101 | (36.0) | 147399 |
| **North** | | | | | | | |
| Haryana | 360861 | (80.9) | 43368 | (9.7) | 41679 | (9.3) | 445908 |
| Himachal Pradesh | 96212 | (52.2) | 17782 | (9.6) | 70296 | (38.1) | 184290 |
| Jammu and Kashmir | 119191 | (55.1) | 19719 | (9.1) | 77269 | (35.7) | 216179 |
| Punjab | 547332 | (65.1) | 269225 | (32.0) | 24691 | (2.9) | 841248 |
| Uttar Pradesh | 120327 | (67.0) | 15695 | (8.7) | 43658 | (24.3) | 179680 |
| Uttarakhand | 30390 | (23.3) | 19335 | (14.8) | 80805 | (61.9) | 130530 |
| All India | 135161 | (66.7) | 29628 | (14.6) | 37964 | (18.7) | 202753 |

Table 3.1.1A: Interventions made under agricultural mechanisation in different region

| Sl. No. | Name of the implement | Mode of Operation (%) (Power ) | % of Beneficiaries availed | Average Cost (Rs. Per equipment) | Subsidy as a per cent of cost | % of equipment in working condition |
|---|---|---|---|---|---|---|
| **South Region** | | | | | | |
| 1 | Tractor/mini tractor | 100.0 | 1.3 | 351322 | 38.9 | 100.0 |
| 2 | Rotavator | 100.0 | 1.4 | 90601 | 43.0 | 100.0 |
| 3 | Tiller | 98.2 | 3.8 | 136653 | 34.2 | 94.6 |
| 4 | Cultivators | 55.6 | 0.6 | 29389 | 41.0 | 88.9 |
| 5 | Ploughs | 100.0 | 0.7 | 40460 | 47.2 | 100.0 |
| 6 | Other land development, tillage and seed bed preparation equipments | 78.6 | 1.0 | 56951 | 59.3 | 100.0 |
| 7 | Seed drill | 100.0 | 0.4 | 44033 | 56.2 | 83.3 |
| 8 | Other Sowing and Planting equipments | 75.0 | 0.3 | 691423 | 36.3 | 100.0 |
| 9 | Sprayers | 33.3 | 0.6 | 19699 | 49.4 | 100.0 |
| 10 | Other Plant protection equipments | 88.6 | 9.0 | 30972 | 45.5 | 93.1 |
| 11 | Cutters | 100.0 | 0.3 | 28244 | 36.8 | 100.0 |
| 12 | Harvesters | 100.0 | 0.8 | 1835058 | 29.1 | 100.0 |
| 13 | Thresher | 100.0 | 1.4 | 118817 | 43.4 | 100.0 |
| 14 | Other Harvesting and threshing equipments | 100.0 | 0.3 | 243063 | 41.9 | 100.0 |
| 15 | Chopper | 86.4 | 1.5 | 20382 | 53.7 | 86.4 |
| 16 | Other Post harvest and agro processing machines | 61.5 | 2.7 | 75096 | 43.9 | 92.3 |
| 17 | pump set | 100.0 | 0.5 | 38776 | 48.5 | 100.0 |
| 18 | Other Water lifting implements | 100.0 | 0.1 | 75000 | 9.3 | 100.0 |
| 19 | Others | 100.0 | 0.21 | 1032833 | 99.7 | 100.0 |
| | TOTAL | 87.7 | 26.7 | 146557 | 39.3 | 94.9 |
| **West and Central Region** | | | | | | |
| 1 | Tractor/mini tractor | 91.7 | 0.6 | 635829 | 51.5 | 100.0 |
| 2 | Rotavator | 95.3 | 4.5 | 74881 | 42.5 | 97.7 |
| 3 | Tiller | 93.3 | 0.8 | 93880 | 64.1 | 93.3 |
| 4 | Cultivators | 100.0 | 0.5 | 19230 | 51.3 | 100.0 |
| 5 | Ploughs | 52.9 | 0.9 | 19446 | 35.8 | 100.0 |
| 6 | Harrow | 100.0 | 0.1 | 30000 | 45.8 | 100.0 |
| 7 | Other land development, tillage and seed bed preparation equipments | 100.0 | 0.4 | 132386 | 51.2 | 85.7 |
| 8 | Seed drill | 100.0 | 0.6 | 26845 | 44.4 | 90.9 |
| 9 | Sprayers | 19.2 | 2.8 | 2688 | 44.6 | 84.6 |
| 10 | Cutters | 95.0 | 1.1 | 22560 | 77.7 | 85.0 |
| 11 | Thresher | 100.0 | 1.1 | 71862 | 18.4 | 100.0 |
| 12 | Other Harvesting and threshing equipments | 100.0 | 0.1 | 150000 | 10.0 | 100.0 |
| 13 | Chopper | 100.0 | 0.2 | 19740 | 100.0 | 100.0 |
| 14 | Pump set | 95.8 | 10.1 | 22360 | 49.0 | 91.5 |
| 15 | Other Water lifting implements | 100.0 | 0.3 | 26600 | 49.4 | 100.0 |
| 16 | Others | 88.1 | 2.2 | 55776 | 49.3 | 97.6 |
| | Total | 85.8 | 26.3 | 53418 | 47.3 | 93.3 |

Table 3.1.1A: Interventions made under agricultural mechanisation in different regions – contd.

| Sl. No. | Name of the implements | Mode of operation (%) Power | % of Beneficiaries availed | Average Cost (Rs. Per equipment) | Subsidy as a per cent of cost | % of equipment in working condition |
|---|---|---|---|---|---|---|
| **East and North-east Region** | | | | | | |
| 1 | Tractor/mini tractor | 100.0 | 0.5 | 452000 | 16.8 | 100.0 |
| 2 | Rotavator | 100.0 | 1.2 | 87066 | 44.6 | 97.1 |
| 3 | Tiller | 92.0 | 4.0 | 133140 | 44.7 | 95.5 |
| 4 | Cultivators | 100.0 | 0.4 | 21991 | 47.4 | 100.0 |
| 5 | Harrow | 100.0 | 0.5 | 47627 | 35.4 | 84.6 |
| 6 | Other land development, tillage and seed bed preparation equipments | 2.3 | 1.6 | 195 | 98.7 | 100.0 |
| 7 | Seed drill | 100.0 | 0.1 | 50000 | 80.0 | 33.3 |
| 8 | Sprayers | 12.8 | 3.1 | 1937 | 68.4 | 94.2 |
| 9 | Other Plant protection equipments | 16.7 | 0.2 | 2363 | 80.8 | 50.0 |
| 10 | Thresher | 84.2 | 0.7 | 55144 | 38.4 | 94.7 |
| 11 | Other Harvesting and threshing equipments | 26.3 | 0.7 | 24842 | 47.0 | 100.0 |
| 12 | Other Post harvest and agro processing machines | 50.0 | 0.2 | 47333 | 99.9 | 100.0 |
| 13 | pump set | 98.3 | 4.2 | 20412 | 44.4 | 94.1 |
| 14 | Other Water lifting implements | 0.0 | 0.4 | 726 | 92.4 | 90.0 |
| 15 | Others | 15.8 | 0.7 | 111590 | 41.5 | 100.0 |
| | Total | 65.0 | 18.5 | 61751 | 39.4 | 94.8 |
| **North Region** | | | | | | |
| 1 | Tractor/mini tractor | 100.0 | 1.2 | 504040 | 17.1 | 100.0 |
| 2 | Rotavator | 94.1 | 0.8 | 82765 | 34.1 | 94.1 |
| 3 | Tiller | 90.0 | 0.5 | 64393 | 40.3 | 100.0 |
| 4 | Cultivators | 88.2 | 0.8 | 17084 | 29.8 | 94.1 |
| 5 | Ploughs | 100.0 | 0.1 | 15000 | 45.0 | 100.0 |
| 6 | Harrow | 100.0 | 1.2 | 28002 | 45.6 | 83.3 |
| 7 | Other land development, tillage and seed bed preparation equipments | 91.7 | 0.6 | 249000 | 16.6 | 91.7 |
| 8 | Seed drill | 93.8 | 1.6 | 64500 | 32.9 | 93.8 |
| 9 | Other Sowing and Planting equipments | 100.0 | 0.1 | 50000 | 40.0 | 100.0 |
| 10 | Sprayers | 39.0 | 2.0 | 8056 | 48.6 | 92.7 |
| 11 | Cutters | 27.3 | 0.5 | 10741 | 93.1 | 100.0 |
| 12 | Thresher | 100.0 | 0.4 | 89250 | 21.4 | 100.0 |
| 13 | Other Harvesting and threshing equipments | 100.0 | 1.5 | 192258 | 21.8 | 90.3 |
| 14 | Chopper | 0.0 | 0.1 | 7000 | 53.6 | 100.0 |
| 15 | Other Post harvest and agro processing machines | 0.0 | 0.2 | 2860 | 53.9 | 100.0 |
| 16 | pump set | 94.4 | 3.5 | 32789 | 60.5 | 90.1 |
| 17 | Other Water lifting implements | 0.0 | 0.1 | 30000 | 41.7 | 100.0 |
| 18 | Others | 83.3 | 0.3 | 6443 | 48.3 | 83.3 |
| | Total | 84.0 | 15.2 | 97007 | 25.3 | 92.6 |

Table 3.1.2A: Usage of farm equipment procured under agricultural mechanisation in different regions

| Sl. No. | Name of the implements | No. of days used per implement per annum | Area covered (acres per implement) | Imputed value own use in (Rs. per implement per annum) | Rented value (Rs. per implement per annum) | Per centage increase in productivity (Modal Value) |
|---|---|---|---|---|---|---|
| **South Region** | | | | | | |
| 1 | Tractor/mini tractor | 41.6 | 28.3 | 19974 | 9284 | Less than 10 % |
| 2 | Rotavator | 23.1 | 48.1 | 19528 | 15500 | Above 50 % |
| 3 | Tiller | 23.2 | 11.8 | 12940 | 9229 | 10 % to 20 % |
| 4 | Cultivators | 18.6 | 22.8 | 4944 | 5333 | Less than 10 % |
| 5 | Ploughs | 29.4 | 26.2 | 32390 | 0 | 30 % to 50 % |
| 6 | Seed drill | 22.6 | 40.2 | 17417 | 3167 | Above 50 % |
| 7 | Harvesters | 92.4 | 545.0 | 74208 | 245833 | 10 % to 20 % |
| 8 | Thresher | 40.9 | 19.7 | 16976 | 7619 | Above 50 % |
| 9 | pump set | 38.0 | 19.0 | 23257 | 0 | Above 50 % |
| | TOTAL | 31.0 | 35.4 | 12491 | 13902 | Less than 10 % |
| **Central and West Region** | | | | | | |
| 1 | Tractor/mini tractor | 58.5 | 153.6 | 32967 | 126508 | Less than 10 % |
| 2 | Rotavator | 45.3 | 36.3 | 22505 | 42707 | 10 % to 20 % |
| 3 | Tiller | 15.5 | 43.9 | 18843 | 12267 | Less than 10 % |
| 4 | Cultivators | 33.4 | 44.4 | 8650 | 7820 | Less than 10 % |
| 5 | Ploughs | 27.7 | 27.8 | 9674 | 25506 | No change |
| 6 | Harrow | 50.5 | 42.9 | 3300 | 6250 | 10 % to 20 % |
| 7 | Seed drill | 46.9 | 27.2 | 9400 | 15818 | Less than 10 % |
| 8 | Thresher | 19.4 | 27.2 | 20000 | 18124 | 10 % to 20 % |
| 9 | pump set | 29.0 | 24.0 | 15324 | 2763 | Less than 10 % |
| | TOTAL | 33.5 | 26.7 | 14241 | 14849 | Less than 10 % |
| **East and North-east Region** | | | | | | |
| 1 | Tractor/mini tractor | 58.5 | 153.6 | 32967 | 126508 | Less than 10 % |
| 2 | Rotavator | 45.3 | 36.3 | 22505 | 42707 | 10 % to 20 % |
| 3 | Tiller | 15.5 | 43.9 | 18843 | 12267 | Less than 10 % |
| 4 | Cultivators | 33.4 | 44.4 | 8650 | 7820 | Less than 10 % |
| 5 | Ploughs | 27.7 | 27.8 | 9674 | 25506 | No change |
| 6 | Harrow | 50.5 | 42.9 | 3300 | 6250 | 10 % to 20 % |
| 7 | Seed drill | 46.9 | 27.2 | 9400 | 15818 | Less than 10 % |
| 8 | Thresher | 19.4 | 27.2 | 20000 | 18124 | 10 % to 20 % |
| 9 | pump set | 29.0 | 24.0 | 15324 | 2763 | Less than 10 % |
| | TOTAL | 33.5 | 26.7 | 14241 | 14849 | Less than 10 % |
| **North Region** | | | | | | |
| 1 | Tractor/mini tractor | 38.1 | 145.8 | 22412 | 69656 | Less than 10 % |
| 2 | Rotavator | 21.3 | 95.0 | 13412 | 25324 | 10 % to 20 % |
| 3 | Tiller | 11.3 | 29.1 | 17700 | 2880 | Less than 10 % |
| 4 | Cultivators | 13.6 | 74.5 | 12924 | 5353 | 10 % to 20 % |
| 5 | Ploughs | 5.0 | 11.0 | 8000 | 0 | 10 % to 20 % |
| 6 | Harrow | 8.3 | 29.5 | 8500 | 4396 | Less than 10 % |
| 7 | Seed drill | 26.0 | 76.0 | 12775 | 37788 | 10 % to 20 % |
| 8 | Thresher | 17.6 | 33.9 | 5375 | 36500 | No change |
| 9 | pump set | 19.7 | 24.6 | 8426 | 5888 | Less than 10 % |
| | TOTAL | 17.8 | 50.1 | 10259 | 22211 | Less than 10 % |

Table 3.1.3A: Impact of agricultural mechanisation on crop productivity in different regions

| Sl. No. | Name of the implements | No change | Less than 10% | 10% to 20% | 20% to 30% | Above 30% |
|---|---|---|---|---|---|---|
| **South Region** | | | | | | |
| 1 | Tractor/mini tractor | 0.0 | 47.4 | 36.8 | 15.8 | 0.0 |
| 2 | Rotavator | 0.0 | 30.0 | 10.0 | 5.0 | 55.0 |
| 3 | Tiller | 9.1 | 23.6 | 40.0 | 14.6 | 12.8 |
| 4 | Cultivators | 22.2 | 44.4 | 33.3 | 0.0 | 0.0 |
| 5 | Ploughs | 0.0 | 0.0 | 10.0 | 20.0 | 70.0 |
| 6 | Seed drill | 0.0 | 16.7 | 0.0 | 0.0 | 83.3 |
| 7 | Harvesters | 0.0 | 8.3 | 33.3 | 25.0 | 33.3 |
| 8 | Thresher | 0.0 | 23.8 | 23.8 | 0.0 | 52.4 |
| 9 | pump set | 0.0 | 28.6 | 0.0 | 0.0 | 71.4 |
| | TOTAL | 4.6 | 33.3 | 25.9 | 14.9 | 21.0 |
| **West and Central Region** | | | | | | |
| 1 | Tractor/mini tractor | 0.0 | 33.3 | 33.3 | 16.7 | 16.7 |
| 2 | Rotavator | 15.3 | 28.2 | 32.9 | 17.7 | 3.5 |
| 3 | Tiller | 0.0 | 66.7 | 26.7 | 6.7 | 0.0 |
| 4 | Cultivators | 10.0 | 40.0 | 40.0 | 10.0 | 0.0 |
| 5 | Ploughs | 41.2 | 11.8 | 23.5 | 5.9 | 11.8 |
| 6 | Harrow | 0.0 | 0.0 | 100.0 | 0.0 | 0.0 |
| 7 | Seed drill | 9.1 | 36.4 | 18.2 | 18.2 | 0.0 |
| 8 | Thresher | 23.8 | 28.6 | 33.3 | 0.0 | 4.8 |
| 9 | pump set | 3.2 | 56.6 | 27.5 | 4.8 | 4.2 |
| | TOTAL | 8.5 | 46.0 | 28.3 | 8.5 | 4.3 |
| **East and North-east Region** | | | | | | |
| 1 | Tractor/mini tractor | 21.4 | 35.7 | 28.6 | 7.1 | 0.0 |
| 2 | Rotavator | 0.0 | 73.5 | 23.5 | 0.0 | 0.0 |
| 3 | Tiller | 4.5 | 47.3 | 30.4 | 8.0 | 0.9 |
| 4 | Cultivators | 0.0 | 90.9 | 9.1 | 0.0 | 0.0 |
| 5 | Ploughs | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 6 | Harrow | 7.7 | 61.5 | 30.8 | 0.0 | 0.0 |
| 7 | Seed drill | 0.0 | 0.0 | 100.0 | 0.0 | 0.0 |
| 8 | Thresher | 47.4 | 31.6 | 15.8 | 0.0 | 0.0 |
| 9 | pump set | 4.2 | 77.1 | 14.4 | 0.9 | 0.0 |
| | TOTAL | 5.8 | 55.1 | 19.1 | 4.7 | 0.6 |
| **North Region** | | | | | | |
| 1 | Tractor/mini tractor | 0.0 | 48.0 | 40.0 | 12.0 | 0.0 |
| 2 | Rotavator | 0.0 | 23.5 | 64.7 | 5.9 | 0.0 |
| 3 | Tiller | 10.0 | 70.0 | 20.0 | 0.0 | 0.0 |
| 4 | Cultivators | 29.4 | 29.4 | 35.3 | 0.0 | 0.0 |
| 5 | Ploughs | 0.0 | 0.0 | 100.0 | 0.0 | 0.0 |
| 6 | Harrow | 16.7 | 50.0 | 25.0 | 0.0 | 0.0 |
| 7 | Seed drill | 15.6 | 28.1 | 40.6 | 9.4 | 3.1 |
| 8 | Thresher | 50.0 | 37.5 | 12.5 | 0.0 | 0.0 |
| 9 | pump set | 4.2 | 45.1 | 39.4 | 5.6 | 0.0 |
| | TOTAL | 12.8 | 43.3 | 32.7 | 5.8 | 0.3 |

Table 3.1.4A: Benefits derived from agricultural mechanisation in different regions

| Sl. No | Name of the implements | Solved labour problems | Enabled timely operations | Saved water | Helped in controlling weed | Helped in good plant growth | Reduced Drud-gery | Helped in transportation | Reduced cost of Cultivation | Increased Cropping intensity |
|---|---|---|---|---|---|---|---|---|---|---|
| **South Region** | | | | | | | | | | |
| 1 | Tractor/mini tractor | 57.9 | 21.1 | 10.5 | 0.0 | 5.3 | 0.0 | 5.3 | 0.0 | 0.0 |
| 2 | Rotavator | 60.0 | 35.0 | 0.0 | 0.0 | 5.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 3 | Tiller | 59.3 | 27.8 | 0.0 | 3.7 | 3.7 | 5.6 | 0.0 | 0.0 | 0.0 |
| 4 | Cultivators | 22.2 | 55.6 | 11.1 | 0.0 | 11.1 | 0.0 | 0.0 | 0.0 | 0.0 |
| 5 | Ploughs | 20.0 | 60.0 | 0.0 | 10.0 | 0.0 | 10.0 | 0.0 | 0.0 | 0.0 |
| 6 | Seed drill | 100.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 7 | Sprayers | 55.6 | 22.2 | 0.0 | 0.0 | 22.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| 8 | Cutters | 75.0 | 25.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 9 | Harvesters | 81.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 18.2 | 0.0 |
| 10 | Thresher | 61.9 | 33.3 | 4.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 11 | Chopper | 72.7 | 18.2 | 0.0 | 9.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 12 | pump set | 14.3 | 14.3 | 0.0 | 0.0 | 57.1 | 0.0 | 0.0 | 14.3 | 0.0 |
| | TOTAL | 58.3 | 21.1 | 2.7 | 2.4 | 7.5 | 3.5 | 0.3 | 1.1 | 3.2 |
| **West and Central Region** | | | | | | | | | | |
| 1 | Tractor/mini tractor | 8.3 | 50.0 | 0.0 | 8.3 | 16.7 | 0.0 | 0.0 | 16.7 | 0.0 |
| 2 | Rotavator | 62.7 | 25.3 | 1.2 | 4.8 | 2.4 | 1.2 | 0.0 | 1.2 | 1.2 |
| 3 | Tiller | 6.7 | 53.3 | 0.0 | 0.0 | 33.3 | 0.0 | 0.0 | 6.7 | 0.0 |
| 4 | Cultivators | 40.0 | 50.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 10.0 | 0.0 |
| 5 | Ploughs | 50.0 | 30.0 | 10.0 | 0.0 | 0.0 | 10.0 | 0.0 | 0.0 | 0.0 |
| 6 | Harrow | 100.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 7 | Seed drill | 100.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 8 | Sprayers | 31.9 | 31.9 | 4.3 | 10.6 | 10.6 | 0.0 | 0.0 | 10.6 | 0.0 |
| 9 | Cutters | 63.2 | 36.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 10 | Thresher | 76.2 | 23.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 11 | Chopper | 50.0 | 50.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 12 | pump set | 11.1 | 67.4 | 16.6 | 0.0 | 4.4 | 0.0 | 0.0 | 0.6 | 0.0 |
| | TOTAL | 33.3 | 47.8 | 7.9 | 2.4 | 4.9 | 0.7 | 0.0 | 2.9 | 0.2 |
| **East and North-east Region** | | | | | | | | | | |
| 1 | Tractor/mini tractor | 30.8 | 15.4 | 0.0 | 0.0 | 23.1 | 0.0 | 15.4 | 0.0 | 15.4 |
| 2 | Rotavator | 5.9 | 20.6 | 0.0 | 17.7 | 41.2 | 2.9 | 0.0 | 5.9 | 5.9 |
| 3 | Tiller | 31.3 | 28.3 | 2.0 | 1.0 | 21.2 | 0.0 | 0.0 | 15.2 | 1.0 |
| 4 | Cultivators | 0.0 | 9.1 | 0.0 | 54.6 | 18.2 | 0.0 | 0.0 | 18.2 | 0.0 |
| 5 | Harrow | 0.0 | 53.9 | 0.0 | 23.1 | 15.4 | 0.0 | 0.0 | 0.0 | 7.7 |
| 6 | Seed drill | 0.0 | 0.0 | 0.0 | 0.0 | 100.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 7 | Sprayers | 0.0 | 30.8 | 0.0 | 0.0 | 64.1 | 0.0 | 0.0 | 2.6 | 2.6 |
| 8 | Thresher | 44.4 | 27.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 27.8 |
| 9 | pump set | 8.9 | 60.2 | 9.7 | 1.8 | 18.6 | 0.0 | 0.0 | 0.0 | 0.9 |
| 10 | TOTAL | 14.8 | 35.2 | 3.8 | 7.4 | 24.2 | 1.0 | 0.5 | 9.2 | 3.8 |
| **North Region** | | | | | | | | | | |
| 1 | Tractor/mini tractor | 4.0 | 76.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 20.0 | 0.0 |
| 2 | Rotavator | 0.0 | 18.8 | 6.3 | 18.8 | 43.8 | 0.0 | 0.0 | 12.5 | 0.0 |
| 3 | Tiller | 10.0 | 80.0 | 0.0 | 10.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 4 | Cultivators | 18.8 | 62.5 | 6.3 | 0.0 | 12.5 | 0.0 | 0.0 | 0.0 | 0.0 |
| 5 | Ploughs | 0.0 | 100.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 6 | Harrow | 27.3 | 36.4 | 4.6 | 4.6 | 27.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| 7 | Seed drill | 19.4 | 29.0 | 6.5 | 9.7 | 32.3 | 0.0 | 0.0 | 3.2 | 0.0 |
| 8 | Sprayers | 2.4 | 24.4 | 0.0 | 2.4 | 70.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| 9 | Cutters | 0.0 | 100.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 10 | Thresher | 25.0 | 62.5 | 12.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 11 | pump set | 1.5 | 50.0 | 27.3 | 0.0 | 18.2 | 1.5 | 0.0 | 1.5 | 0.0 |
| 12 | TOTAL | 9.2 | 46.6 | 9.5 | 3.1 | 22.8 | 2.7 | 0.0 | 3.1 | 3.1 |

Table 3.2.1A: Interventions made under crop development in different regions

| Sl. No. | Benefits | % of beneficiaries | Area covered per HH in acres | Quantity supplied per HH in kgs. | Actual cost (Rs. Per HH) | Subsidy ( Rs. Per HH) | Subsidy as a per cent of actual cost | % increase in productivity |
|---|---|---|---|---|---|---|---|---|
| **South Region** | | | | | | | | |
| 1 | Seeds / planting materials | 11.6 | 2.8 | 68.3 | 5129 | 2784 | 54.3 | 10 % to 20 % |
| 2 | Fertilizers and plant protection | 6.7 | 1.8 | 220.0 | 4902 | 3069 | 62.6 | 10 % to 20 % |
| 3 | Micro nutrients | 4.2 | 2.9 | 182.0 | 1251 | 925 | 73.9 | 10 % to 20 % |
| 4 | Bio-fertilizers and bio-control agents | 1.4 | 1.6 | 81.7 | 1217 | 1103 | 90.6 | 10 % to 20 % |
| 5 | Others | 0.2 | 0.2 | 1.2 | 16667 | 2000 | 12.0 | No change |
| 6 | TOTAL | 24.2 | 2.4 | 130.5 | 4253 | 2431 | 57.2 | 10 % to 20 % |
| **West and Central Region** | | | | | | | | |
| 1 | Seeds / planting materials | 13.1 | 1.2 | 13.2 | 2186 | 1642 | 75.1 | Less than 10 % |
| 2 | Fertilizers and plant protection | 6.7 | 1.8 | 86.0 | 1233 | 1078 | 87.5 | Less than 10 % |
| 3 | Micro nutrients | 4.5 | 1.3 | 34.7 | 1093 | 955 | 87.4 | Less than 10 % |
| 4 | Bio-fertilizers and bio-control agents | 2.9 | 0.7 | 23.0 | 584 | 503 | 86.0 | Less than 10 % |
| 5 | Area based incentives | 1.6 | 2.4 | 0.0 | 5458 | 4379 | 80.2 | Less than 10 % |
| 6 | Others | 1.4 | 1.2 | 1.2 | 5413 | 5098 | 94.2 | Less than 10 % |
| 7 | TOTAL | 30.2 | 1.4 | 32.2 | 1978 | 1608 | 81.3 | Less than 10 % |
| **East and North East Region** | | | | | | | | |
| 1 | Seeds / planting materials | 23.4 | 1.3 | 46.4 | 2287 | 2164 | 94.7 | Less than 10 % |
| 2 | Fertilizers and plant protection | 14.2 | 1.7 | 34.1 | 645 | 529 | 82.1 | Less than 10 % |
| 3 | Micro nutrients | 6.7 | 1.2 | 16.0 | 313 | 299 | 95.6 | Less than 10 % |
| 4 | Bio-fertilizers and bio-control agents | 3.9 | 1.1 | 196.7 | 440 | 419 | 95.4 | Less than 10 % |
| 5 | Area based incentives | 3.4 | 1.7 | 18.4 | 1931 | 1728 | 89.5 | Less than 10 % |
| 6 | Others | 3.9 | 1.4 | 117.9 | 4256 | 3410 | 80.1 | 10 % to 20 % |
| 7 | TOTAL | 55.6 | 1.4 | 53.4 | 1614 | 1458 | 90.3 | Less than 10 % |
| **North Region** | | | | | | | | |
| 1 | Seeds / planting materials | 10.4 | 1.5 | 24.3 | 965 | 559 | 57.9 | Less than 10 % |
| 2 | Fertilizers and plant protection | 3.4 | 2.9 | 34.9 | 930 | 576 | 61.9 | Less than 10 % |
| 3 | Micro nutrients | 2.6 | 3.1 | 49.1 | 1428 | 858 | 60.1 | Less than 10 % |
| 4 | Bio-fertilizers and bio-control agents | 0.2 | 1.2 | 33.0 | 2673 | 2050 | 76.7 | Less than 10 % |
| 5 | Area based incentives | 0.4 | 6.8 | 0.0 | 11767 | 7806 | 66.3 | Less than 10 % |
| 6 | Others | 0.8 | 1.5 | 4.3 | 677 | 640 | 94.5 | Less than 10 % |
| 7 | TOTAL | 17.8 | 2.1 | 28.5 | 1298 | 804 | 61.9 | Less than 10 % |

Table 3.2.2A: Impact of crop development on crop productivity in different regions

| Sl. No. | Benefits | No change | Less than 10% | 10% to 20% | 20% to 30% | Above 30 % |
|---|---|---|---|---|---|---|
| **South Region** | | | | | | |
| 1 | Seeds / planting materials | 5.9 | 20.0 | 32.9 | 14.1 | 25.3 |
| 2 | Fertilizers and plant protection | 4.1 | 28.6 | 33.7 | 20.4 | 10.2 |
| 3 | Micro nutrients | 4.8 | 16.1 | 32.3 | 29.0 | 17.7 |
| 4 | Bio-fertilizers and bio-control agents | 4.8 | 9.5 | 33.3 | 23.8 | 23.8 |
| 5 | Others | 33.3 | 0.0 | 0.0 | 0.0 | 0 |
| | TOTAL | 5.4 | 20.9 | 32.8 | 18.9 | 19.5 |
| **West and Central Region** | | | | | | |
| 1 | Seeds / planting materials | 15.0 | 40.7 | 26.0 | 8.5 | 7.8 |
| 2 | Fertilizers and plant protection | 3.2 | 15.9 | 11.1 | 4.0 | 4 |
| 3 | Micro nutrients | 2.4 | 14.3 | 22.6 | 6.0 | 2.4 |
| 4 | Bio-fertilizers and bio-control agents | 0.0 | 7.3 | 3.6 | 1.8 | 0 |
| 5 | Area based incentives | 10.0 | 70.0 | 16.7 | 0.0 | 0 |
| 6 | Others | 0.0 | 23.1 | 0.0 | 0.0 | 0 |
| | TOTAL | 8.1 | 28.8 | 18.3 | 5.6 | 4.6 |
| **East and North East Region** | | | | | | |
| 1 | Seeds / planting materials | 4.3 | 48.0 | 25.0 | 8.1 | 6.1 |
| 2 | Fertilizers and plant protection | 6.1 | 47.0 | 19.7 | 1.3 | 4.5 |
| 3 | Micro nutrients | 1.6 | 50.8 | 30.5 | 1.1 | 1 |
| 4 | Bio-fertilizers and bio-control agents | 4.6 | 50.0 | 20.4 | 0.9 | 2.8 |
| 5 | Area based incentives | 15.8 | 49.5 | 20.0 | 4.2 | 4.2 |
| 6 | Others | 0.0 | 13.0 | 25.0 | 8.3 | 12 |
| | TOTAL | 4.9 | 45.9 | 23.7 | 4.8 | 5.2 |
| **North Region** | | | | | | |
| 1 | Seeds / planting materials | 16.4 | 47.0 | 31.5 | 3.3 | 0.5 |
| 2 | Fertilizers and plant protection | 0.0 | 28.6 | 5.7 | 0.0 | 0 |
| 3 | Micro nutrients | 1.9 | 41.5 | 28.3 | 1.9 | 0 |
| 4 | Bio-fertilizers and bio-control agents | 0.0 | 75.0 | 25.0 | 0.0 | 0 |
| 5 | Area based incentives | 0.0 | 44.4 | 44.4 | 11.1 | 0 |
| 6 | Others | 6.3 | 37.5 | 0.0 | 0.0 | 0 |
| | TOTAL | 10.1 | 42.5 | 24.9 | 2.5 | 0.3 |

Table 3.3.1A: Intervention made under horticultural infrastructure in different regions

| Sl. No | Infrastructure created by the household through intervention | % of beneficiaries | Dimension of infrastructure created | | Actual Cost in Rs. | Subsidy as a % of cost | Impact of intervention (%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Acres | No of unit | | | Increase in productivity | Decrease in cost | Increase in income | Decrease in post harvest losses |
| **South Region** | | | | | | | | | | |
| 1 | Field Nursery | 4.3 | 2.2 | 0.0 | 19911 | 65.2 | <10% | No change | 10 % to 20 % | No change |
| 2 | Poly House | 0.3 | 1.4 | 25.3 | 7750 | 66.1 | <10% | No change | No change | >10% |
| 3 | Shade Net | 0.5 | 1.2 | 1.1 | 41143 | 55.2 | <10% | No change | <10% | No change |
| 4 | Green House | 0.5 | 1.6 | 0.0 | 1454286 | 39.4 | 10 % to 20 % | <10% | 10 % to 20 % | > 10 % |
| 5 | Plastic crates | 0.1 | 0.0 | 0.0 | 40000 | 50.0 | 10 % to 20 % | No change | 10 % to 20 % | No change |
| 9 | Grading/packing Equipments | 0.1 | 7.0 | 0.0 | 52500 | 50.0 | 10 % to 20 % | <10% | 10 % to 20 % | 10 % to 20 % |
| 11 | Refrigerated Van | 0.1 | 0.0 | 1.0 | 564000 | 100.0 | 10 % to 20 % | <10% | <10% | No change |
| 12 | Any other 1 | 3.8 | 1.8 | 0.0 | 61825 | 37.1 | <10% | <10% | <10% | <10% |
| **Total** | | 9.5 | 2.0 | 0.8 | 113743 | 43.5 | <10% | <10% | <10% | <10% |
| **West and Central Region** | | | | | | | | | | |
| 1 | Shade Net | 0.3 | 0.6 | 0.0 | 26400 | 66.1 | <10% | <10% | <10% | 10 % to 20 % |
| 2 | Green House | 1.2 | 1.3 | 0.0 | 44291 | 59.9 | <10% | <10% | 10 % to 20 % | <10% |
| 3 | Plastic crates | 0.9 | 45.3 | 0.0 | 11394 | 47.9 | No change | <10% | 10 % to 20 % | <10% |
| 4 | Storage bins | 0.7 | 4.1 | 0.6 | 2569 | 83.8 | No change | No change | <10% | No change |
| 5 | Ripening chamber | 0.1 | 1.0 | 0.0 | 0 | 0.0 | No response | No response | No response | No response |
| 6 | Any other | 4.2 | 19.6 | 0.2 | 239255 | 53.3 | No change | <10% | 10 % to 20 % | <10% |
| Total | | 7.3 | 17.4 | 0.2 | 146275 | 53.7 | No change | <10% | 10 % to 20 % | <10% |
| **East and North Eastern Region** | | | | | | | | | | |
| 1 | Field Nursery | 3.1 | 0.8 | 506.2 | 16055 | 87.3 | 20% to 30% | 30% to 50% | 20 % to 30 % | No change |
| 2 | Poly House | 1.4 | 11.8 | 0.0 | 28289 | 95.7 | No change | No change | 20 % to 30 % | No change |
| 3 | Shade Net | 0.6 | 37.2 | 0.0 | 107637 | 97.8 | No change | < 10 % | 10 % to 20 % | No change |
| 4 | Green House | 0.6 | 0.9 | 55.9 | 82118 | 97.4 | 20 % to 30 % | No change | 30 % to 50 % | < 10 % |
| 5 | Plastic crates | 0.8 | 75.1 | 5.5 | 120241 | 88.1 | 20 % to 30 % | < 10 % | 10 % to 20 % | < 10 % |
| 6 | Storage bins | 0.5 | 4.1 | 0.0 | 2226 | 74.3 | No change | < 10 % | < 10 % | < 10 % |
| 7 | Grading/packing Equipments | 0.1 | 1.0 | 0.0 | 1500 | 100.0 | Above 50 % | Above 50 % | Above 50 % | Above 50 % |
| 8 | Processing Equipments | 0.0 | 0.3 | 0.0 | 2850 | 100.0 | Above 50% | Above 50 % | Above 50 % | Above 50 % |
| 9 | Refrigerated Van | 0.1 | 0.3 | 0.0 | 3375 | 91.1 | Above 50 % | Above 50 % | Above 50 % | Above 50 % |
| 10 | Any other 1 | 4.0 | 7.3 | 10.8 | 16463 | 77.6 | 20 % to 30% | 20 % to 30 % | 10 % to 20 % | < 10 % |
| | Total | 11.1 | 11.9 | 146.1 | 32982 | 89.9 | 20 % to 30 % | No change | 10 % to 20 % | < 10 % |
| **North Region** | | | | | | | | | | |
| 1 | Field Nursery | 0.5 | 84.3 | 0 | 14175 | 53.0 | <10% | <10% | 10 % to 20 % | No change |
| 2 | Poly House | 0.5 | 112.5 | 0 | 220502 | 54.4 | <10% | <10% | 10 % to 20 % | <10% |
| 3 | Shade Net | 1.2 | 26.8 | 0 | 32014 | 61.3 | <10% | <10% | <10% | <10% |
| 4 | Green House | 0.2 | 100.1 | 0 | 491143 | 45.2 | <10% | No change | <10% | No change |
| 5 | Plastic crates | 2.7 | 47.3 | 0 | 12656 | 49.8 | No change | <10% | <10% | <10% |
| 6 | Storage bins | 0.9 | 0.6 | 0 | 6000 | 100.0 | <10% | <10% | <10% | No change |
| 7 | Any other 1 | 0.1 | 10.5 | 0 | 86000 | 30.2 | <10% | No change | <10% | <10% |
| | Total | 6.2 | 45.7 | 0 | 48476 | 52.0 | No change | <10% | <10% | <10% |

Table 3.3.2A: Impact of horticulture infrastructure development on crop productivity and farmers' income in different regions

| Sl. No. | Impact of intervention | % beneficiaries reported | | | | | |
|---|---|---|---|---|---|---|---|
| | | No change | < 10 per cent | 10 to 20 per cent | 20 to 30 per cent | Above 30 per cent | Not answered |
| **South Region** | | | | | | | |
| 1 | Increase in productivity | 4.3 | 28.8 | 20.1 | 7.9 | 12.2 | 25.9 |
| 2 | Decrease in cost | 24.5 | 27.3 | 18.7 | 2.2 | 3.6 | 23.0 |
| 3 | Increase in income | 6.5 | 26.6 | 20.1 | 12.2 | 8.6 | 25.9 |
| 4 | Decrease in post harvest losses | 22.3 | 30.9 | 12.2 | 3.6 | 5.8 | 25.2 |
| **West and Central Region** | | | | | | | |
| 1 | Increase in productivity | 51.8 | 21.9 | 11.7 | 1.5 | 2.9 | 10.2 |
| 2 | Decrease in cost | 24.8 | 46.0 | 15.3 | 3.7 | 0.0 | 10.2 |
| 3 | Increase in income | 18.3 | 25.6 | 34.3 | 8.8 | 3.0 | 10.2 |
| 4 | Decrease in post harvest losses | 16.1 | 40.2 | 21.9 | 8.0 | 3.6 | 10.2 |
| **East and North East Region** | | | | | | | |
| 1 | Increase in productivity | 12.9 | 15.8 | 17.1 | 23.9 | 20.6 | 0.0 |
| 2 | Decrease in cost | 22.3 | 21.6 | 13.2 | 16.8 | 17.7 | 0.0 |
| 3 | Increase in income | 9.0 | 15.5 | 26.1 | 20.3 | 20.0 | 0.0 |
| 4 | Decrease in post harvest losses | 21.6 | 30.3 | 9.4 | 12.6 | 15.8 | 0.0 |
| **North Region** | | | | | | | |
| 1 | Increase in productivity | 47.6 | 57.1 | 15.1 | 4.0 | 0.0 | 0.0 |
| 2 | Decrease in cost | 27.8 | 91.3 | 7.1 | 3.2 | 0.0 | 0.0 |
| 3 | Increase in income | 20.6 | 74.6 | 31.0 | 2.4 | 0.8 | 0.0 |
| 4 | Decrease in post harvest losses | 43.7 | 61.9 | 19.8 | 3.2 | 0.8 | 0.0 |

Table 3.3.3A: Intervention made under horticulture crop development in different regions

| Sl. No. | Benefit code | % of Beneficiaries | Area in Acres (per hh) | Qty Supplied in kg per hh | Actual Cost Rs (per hh) | Subsidy as a % of cost | % increase in productivity | % decrease in cost |
|---|---|---|---|---|---|---|---|---|
| **South Region** | | | | | | | | |
| 1 | Seeds /Planting Materials | 9.2 | 1.5 | 116.6 | 11634.9 | 61.1 | >10 % | >10 % |
| 2 | Fertilizers and plant protection | 10.8 | 2.0 | 490.2 | 8435.8 | 55.8 | >10 % | No change |
| 3 | Micro Nutrients | 0.3 | 3.4 | 340.4 | 7040.0 | 55.1 | No change | No change |
| 4 | Others | 0.1 | 2.5 | 0.0 | 47000.0 | 19.2 | >10 % | 10 % to 20 % |
| | Total | 20.5 | 1.8 | 317.4 | 9985.8 | 58.0 | >10 % | >10 % |
| **West and Central Region** | | | | | | | | |
| 1 | Seeds /Planting Materials | 6.3 | 1.9 | 92.4 | 13144 | 91.9 | > 10 % | > 10 % |
| 2 | Fertilizers and plant protection | 1.7 | 0.7 | 2.8 | 5560 | 52.3 | > 10 % | > 10 % |
| 3 | Micro Nutrients | 0.4 | 0.7 | 1.4 | 2439 | 78.6 | No change | > 10 % |
| 4 | Bio-fertilizers and bio control agents | 0.3 | 1.2 | 11.6 | 979 | 100.0 | 10 % to 20 % | > 10 % |
| 5 | Area based incentives | 0.3 | 1.5 | 0.0 | 10350 | 95.2 | > 10 % | > 10 % |
| 6 | Others | 0.1 | 0.5 | 1.0 | 0 | 0.0 | No Response | No Response |
| | Total | 9.0 | 1.6 | 66.0 | 10726 | 88.1 | > 10 % | > 10 % |
| **East and North Eastern Region** | | | | | | | | |
| 1 | Seeds /Planting Materials | 9.7 | 1.3 | 2722.6 | 7880 | 59.2 | 10 % to 20 % | > 10 % |
| 2 | Fertilizers and plant protection | 2.1 | 1.6 | 43.4 | 1729 | 71.6 | > 10 % | > 10 % |
| 3 | Micro Nutrients | 0.3 | 1.1 | 27.4 | 1131 | 100.0 | > 10 % | No change |
| 4 | Bio-fertilizers and bio control agents | 0.7 | 1.2 | 91.8 | 4699 | 98.4 | > 10 % | No change |
| 5 | Area based incentives | 0.3 | 1.4 | 0.1 | 23125 | 100.0 | 20 % to 30 % | No change |
| 6 | Others | 1.1 | 1.7 | 193.1 | 41670 | 87.7 | 20 % to 30 % | > 10 % |
| | Total | 14.1 | 1.4 | 1899.7 | 9699 | 72.2 | > 10 % | > 10 % |
| **North Region** | | | | | | | | |
| 1 | Seeds /Planting Materials | 15.4 | 0.5 | 70.0 | 1058 | 68.3 | > 10 % | No change |
| 2 | Fertilizers and plant protection | 2.7 | 4.4 | 24.4 | 5447 | 50.9 | > 10 % | > 10 % |
| 3 | Micro Nutrients | 0.7 | 1.1 | 6.5 | 723 | 86.2 | > 10 % | > 10 % |
| 4 | Bio-fertilizers and bio control agents | 0.9 | 3.4 | 6.3 | 541 | 66.7 | > 10 % | > 10 % |
| 5 | Area based incentives | 0.1 | 2.0 | 2.6 | 928 | 60.8 | > 10 % | > 10 % |
| 6 | Others | 1.2 | 1.2 | 210.1 | 5591 | 49.8 | > 10 % | > 10 % |
| | Total | 21.0 | 1.2 | 67.1 | 1847 | 58.7 | > 10 % | > 10 % |

Table 3.3.4A: Impact of horticulture crop development on crop productivity in different regions

| Sl. No. | Benefit code | % beneficiary reported increase in productivity | | | | | |
|---|---|---|---|---|---|---|---|
| | | No change | Less than 10 per cent | 10 to 20 Per cent | 20 to 30 Per cent | Above 30 Per cent | Not responded |
| **South Region** | | | | | | | |
| 1 | Seeds /Planting Materials | 14.1 | 31.9 | 22.2 | 7.4 | 0.7 | 23.7 |
| 2 | Fertilizers and plant protection | 8.2 | 29.8 | 12.7 | 3.8 | 2.5 | 43.0 |
| 3 | Micro Nutrients | 20.0 | 0.0 | 20.0 | 20.0 | 0 | 40.0 |
| 4 | Others | 0.0 | 100.0 | 0.0 | 0.0 | 0 | 0.0 |
| | Total | 11.0 | 30.4 | 17.1 | 5.7 | 1.7 | 34.1 |
| **West and Central Region** | | | | | | | |
| 1 | Seeds /Planting Materials | 26.1 | 46.2 | 16.0 | 4.2 | 2.5 | 5.0 |
| 2 | Fertilizers and plant protection | 12.9 | 61.3 | 16.1 | 0.0 | 0 | 9.7 |
| 3 | Micro Nutrients | 25.0 | 25.0 | 25.0 | 0.0 | 12.5 | 12.5 |
| 4 | Bio-fertilizers and bio control agents | 20.0 | 20.0 | 40.0 | 0.0 | 20 | 0.0 |
| 5 | Area based incentives | 0.0 | 80.0 | 20.0 | 0.0 | 0 | 0.0 |
| 6 | Others | 0.0 | 0.0 | 0.0 | 0.0 | 0 | 100.0 |
| | Total | 22.5 | 47.9 | 17.2 | 3.0 | 3 | 6.5 |
| **East and North East** | | | | | | | |
| 1 | Seeds /Planting Materials | 10.0 | 19.7 | 22.3 | 22.3 | 13.4 | 12.3 |
| 2 | Fertilizers and plant protection | 12.3 | 26.3 | 12.3 | 5.3 | 7 | 36.8 |
| 3 | Micro Nutrients | 14.3 | 42.9 | 14.3 | 0.0 | 0 | 28.6 |
| 4 | Bio-fertilizers and bil control agents | 5.3 | 15.8 | 15.8 | 15.8 | 5.3 | 42.1 |
| 5 | Area based incentives | 0.0 | 12.5 | 12.5 | 37.5 | 0 | 37.5 |
| 6 | Others | 3.2 | 22.6 | 16.1 | 29.0 | 6.4 | 22.6 |
| | Total | 9.5 | 21.0 | 19.7 | 20.0 | 11.1 | 18.9 |
| **North Region** | | | | | | | |
| 1 | Seeds /Planting Materials | 27.9 | 39.6 | 18.0 | 1.6 | 0.3 | 12.7 |
| 2 | Fertilizers and plant protection | 3.6 | 41.8 | 20.0 | 3.6 | 0 | 30.9 |
| 3 | Micro Nutrients | 13.3 | 20.0 | 13.3 | 6.7 | 0 | 46.7 |
| 4 | Bio-fertilizers and bio control agents | 0.0 | 27.8 | 11.1 | 0.0 | 0 | 61.1 |
| 5 | Area based incentives | 0.0 | 50.0 | 0.0 | 0.0 | 0 | 50.0 |
| 6 | Others | 4.0 | 40.0 | 20.0 | 0.0 | 0 | 36.0 |
| | Total | 21.6 | 38.8 | 17.9 | 1.9 | 0.2 | 19.7 |

Table 3.4.1A: Intervention made under micro/minor irrigation in different regions

| S. N. | Details of intervention | % of beneficiaries | Irrigated area | | Avg Cost in Rs. | Subsidy as a % of cost | Impact of intervention (%) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Acres | % increase | | | Increase in productivity | Decrease in cost | Increase in income |
| **South Region** | | | | | | | | | |
| 1 | Drilling bore well | 0.3 | 1.1 | 4.3 | 33750 | 45.2 | 10 % to 20 % | < 10 % | < 10 % |
| 2 | Pump set | 2.3 | 2.2 | 8.7 | 17012 | 38.8 | < 10 % | < 10 % | < 10 % |
| 3 | Farm pond construction | 1.2 | 6.2 | 2.6 | 31747 | 53.5 | < 10 % | < 10 % | 10 % to 20 % |
| 4 | Sprinkler | 0.6 | 3.1 | 27.5 | 20937 | 56.4 | < 10 % | < 10 % | < 10 % |
| 5 | Drip Irrigation | 3.8 | 2.7 | 30.0 | 87030 | 73.4 | Above 50 % | < 10 % | 10 % to 20 % |
| 6 | Others | 0.1 | 4.0 | 20.0 | 47308 | 100.0 | Above 50 % | Above 50 % | Above 50 % |
| | Total | 8.2 | 3.0 | 19.0 | 52847 | 67.7 | < 10 % | < 10 % | < 10 % |
| **West and Central Region** | | | | | | | | | |
| 1 | Drilling bore well | 0 | 0 | 0 | 0 | 0 | NA | NA | NA |
| 2 | Pump set | 5.6 | 6.3 | 2.8 | 79553 | 28.3 | < 10 % | < 10 % | 10 % to 20 % |
| 3 | Farm pond construction | 9.3 | 5.5 | 8.6 | 61873 | 52.9 | < 10 % | < 10 % | < 10 % |
| 4 | Sprinkler | 2.8 | 5.5 | 3.0 | 60677 | 43.6 | 10 % to 20 % | < 10 % | 10 % to 20 % |
| 5 | Drip Irrigation | 7.4 | 4.2 | 4.1 | 32921 | 47.5 | < 10 % | < 10 % | 10 % to 20 % |
| 6 | Others | 5.7 | 5.7 | 45.3 | 263193 | 50.7 | 10 % to 20 % | < 10 % | < 10 % |
| | Total | 30.8 | 5.4 | 12.8 | 95573 | 47.1 | < 10 % | < 10 % | 10 % to 20 % |
| **East and North East Region** | | | | | | | | | |
| 1 | Drilling bore well | 0 | 0 | 0 | 0 | 0 | NA | NA | NA |
| 2 | Pump set | 1.1 | 5.7 | 2.3 | 25607 | 54.9 | < 10 % | < 10 % | 20 % to 30 % |
| 3 | Farm pond construction | 4.2 | 4.7 | 2.7 | 22738 | 54.6 | < 10 % | < 10 % | 10 % to 20 % |
| 4 | Sprinkler | 0.1 | 5.7 | 4.0 | 253500 | 96.1 | < 10 % | No change | < 10 % |
| 5 | Drip Irrigation | 1.0 | 13.0 | 8.9 | 42666 | 93.3 | < 10 % | < 10 % | < 10 % |
| 6 | Others | 0.8 | 2.3 | 3.7 | 47476 | 86.7 | < 10 % | < 10 % | 30 % to 50 % |
| | Total | 7.3 | 5.7 | 3.6 | 33082 | 72.6 | < 10 % | < 10 % | < 10 % |
| **North Region** | | | | | | | | | |
| 1 | Drilling bore well | 5.2 | 5.5 | 9.6 | 148457 | 75.7 | 10 % to 20 % | < 10 % | 10 % to 20 % |
| 2 | Pump set | 5.2 | 4.9 | 5.7 | 109654 | 45.4 | < 10 % | < 10 % | 10 % to 20 % |
| 3 | Farm pond construction | 1.8 | 2.7 | 7.1 | 41384 | 20.8 | < 10 % | < 10 % | < 10 % |
| 4 | Sprinkler | 0.0 | 0.0 | 0.0 | 0 | 0.0 | NA | NA | NA |
| 5 | Drip Irrigation | 0.0 | 0.0 | 0.0 | 0 | 0.0 | NA | NA | NA |
| 6 | Others | 0.7 | 6.7 | 3.0 | 231332 | 55.8 | < 10 % | < 10 % | 10 % to 20 % |
| | Total | 12.9 | 4.9 | 7.3 | 122579 | 60.1 | < 10 % | < 10 % | 10 % to 20 % |

Table 3.4.2A: Impact of micro/minor irrigation interventions on crop productivity

| Sl. No | Impact of intervention | % beneficiaries reported | | | | | |
|---|---|---|---|---|---|---|---|
| | | No change | Less than 10 per cent | 10 to 20 Per cent | 20 to 30 Per cent | Above 30 per cent | No response |
| **South Region** | | | | | | | |
| 1 | Increase in Productivity | 4.2 | 35.8 | 21.7 | 10.8 | 25.8 | 1.7 |
| 2 | Decrease in cost | 14.2 | 51.7 | 15.0 | 5.8 | 11.7 | 1.7 |
| 3 | Increase in income | 6.7 | 31.7 | 27.5 | 10.0 | 22.5 | 1.7 |
| 4 | Increase in irrigated area | 0.8 | 46.7 | 23.3 | 9.2 | 20.0 | 0.0 |
| **West and Central Region** | | | | | | | |
| 1 | Increase in Productivity | 3.1 | 44.9 | 32.1 | 9.8 | 5.9 | 4.2 |
| 2 | Decrease in cost | 17.6 | 58.2 | 12.8 | 4.5 | 2.6 | 4.3 |
| 3 | Increase in income | 4.5 | 31.8 | 40.8 | 11.4 | 5.4 | 6.2 |
| 4 | Increase in irrigated area | 2.3 | 77.9 | 0.0 | 4.3 | 15.5 | 0.0 |
| **East and North East Region** | | | | | | | |
| 1 | Increase in Productivity | 2.0 | 59.4 | 20.8 | 7.4 | 8.9 | 1.5 |
| 2 | Decrease in cost | 16.3 | 63.9 | 5.9 | 3.0 | 7.9 | 3.0 |
| 3 | Increase in income | 1.0 | 41.6 | 32.2 | 14.4 | 7.4 | 3.5 |
| 4 | Increase in irrigated area | 5.0 | 92.6 | 0.0 | 0.5 | 2.0 | 0.0 |
| **North Region** | | | | | | | |
| 1 | Increase in Productivity | 3.0 | 43.6 | 33.0 | 3.8 | 4.9 | 11.7 |
| 2 | Decrease in cost | 15.2 | 62.5 | 9.9 | 0.8 | 0.0 | 11.7 |
| 3 | Increase in income | 1.9 | 21.6 | 50.8 | 8.7 | 3.8 | 13.3 |
| 4 | Increase in irrigated area | 9.9 | 80.7 | 0.0 | 5.3 | 4.2 | 0.0 |

Table 3.5.1A: Intervention made under animal husbandry and dairy in different regions

| S. N. | Animal / Item | % of beneficiaries | Average No. per HH | Average cost per HH (Rs.) | Average subsidy per HH (Rs.) | Subsidy as a percent of cost | Increase in productivity (Modal Value) | Fall in labour cost (Modal value) | Better cattle health (modal value) |
|---|---|---|---|---|---|---|---|---|---|
| **South Region** | | | | | | | | | |
| 1 | Cows | 6.4 | 1.7 | 47590 | 15728 | 33.1 | 10 % to 20 % | NR | NR |
| 2 | Bufaloes | 5.2 | 1.2 | 41552 | 16150 | 38.9 | 10 % to 20 % | NR | NR |
| 3 | Sheep / Goat | 0.8 | 11.3 | 28447 | 14619 | 51.4 | < 10 % | NR | NR |
| 4 | Pig | 1.1 | 2.6 | 2750 | 1275 | 46.4 | 10 % to 20 % | NR | NR |
| 5 | Poultry | 0.3 | 75.0 | 7744 | 7434 | 96.0 | 20 % to 30 % | NR | NR |
| 6 | Insurance of Cattle | 5.3 | 1.3 | 1874 | 1853 | 98.9 | NA | NR | NR |
| 7 | Cattle shed | 1.4 | - | 31190 | 25000 | 80.2 | 10 % to 20 % | No change | Above 50 % |
| 8 | Fodder Chopper | 0.0 | - | 0 | 0 | 0.0 | NA | NA | NA |
| 9 | Milking instruments | 0.1 | - | 15400 | 15400 | 100.0 | 10 % to 20 % | No change | < 10 % |
| 10 | Foggers | 0.0 | - | 0 | 0 | 0.0 | NA | NA | NA |
| 11 | Others | 4.8 | - | 16686 | 7956 | 47.7 | < 10 % | < 10 % | < 10 % |
| | TOTAL | 25.5 | - | 26969 | 11219 | 41.6 | 10 % to 20 % | No change | Above 50 % |
| **West and Central Region** | | | | | | | | | |
| 1 | Cows | 1.1 | 5.2 | 67410 | 34965 | 51.9 | 10 % to 20 % | NR | NR |
| 2 | Bufaloes | 0.7 | 1.6 | 57492 | 28234 | 49.1 | 10 % to 20 % | NR | NR |
| 3 | Sheep / Goat | 3.8 | 10.7 | 27819 | 15225 | 54.7 | 10 % to 20 % | < 10 % | NA |
| 4 | Pig | 0.0 | 0.0 | 0 | 0 | 0.0 | NA | NA | NA |
| 5 | Poultry | 0.3 | 35.0 | 7200 | 4267 | 59.3 | 10 % to 20 % | NR | NR |
| 6 | Insurance of Cattle | 1.3 | 4.8 | 888 | 436 | 49.1 | NA | NR | NR |
| 7 | Cattle shed | 0.5 | - | 90858 | 56358 | 62.0 | No change | No change | No change |
| 8 | Fodder Chopper | 1.7 | - | 14895 | 11314 | 76.0 | < 10 % | < 10 % | < 10 % |
| 9 | Milking instruments | 0.1 | - | 103000 | 46350 | 45.0 | < 10 % | No change | < 10 % |
| 10 | Foggers | 0.0 | - | 0 | 0 | 0.0 | NA | NA | NA |
| 11 | Others | 0.6 | - | 663 | 663 | 100.0 | No change | No change | No change |
| | TOTAL | 10.0 | - | 29875 | 16766 | 56.1 | 10 % to 20 % | < 10 % | < 10 % |
| **East and North-east Region** | | | | | | | | | |
| 1 | Cows | 2.3 | 4.2 | 128595 | 60517 | 47.1 | 10 % to 20 % | 10 % to 20 % | NA |
| 2 | Bufaloes | 1.2 | 1.0 | 29015 | 19224 | 66.3 | No change | No change | No change |
| 3 | Sheep / Goat | 1.0 | 8.8 | 17341 | 14517 | 83.7 | < 10 % | < 10 % | NA |
| 4 | Pig | 1.2 | 8.4 | 34844 | 26997 | 77.5 | < 10 % | < 10 % | NA |
| 5 | Poultry | 2.1 | 191.5 | 9019 | 6535 | 72.5 | < 10 % | 20 % to 30 % | NA |
| 6 | Insurance of Cattle | 0.9 | 2.0 | 5324 | 5199 | 97.7 | NA | NA | NA |
| 7 | Cattle shed | 1.5 | - | 24624 | 23201 | 94.2 | 20 % to 30 % | 10 % to 20 % | 30 % to 50 % |
| 8 | Fodder Chopper | 0.0 | - | 8000 | 4000 | 50.0 | < 10 % | < 10 % | < 10 % |
| 9 | Milking instruments | 0.1 | - | 9000 | 7667 | 85.2 | 20 % to 30 % | 10 % to 20 % | 30 % to 50 % |
| 10 | Foggers | 0.2 | - | 113200 | 101200 | 89.4 | No change | Above 50 % | 30 % to 50 % |
| 11 | Others | 4.2 | - | 45405 | 38127 | 84.0 | 20 % to 30 % | 20 % to 30 % | No change |
| | TOTAL | 14.5 | - | 45591 | 30268 | 66.4 | < 10 % | < 10 % | 30 % to 50 % |
| **North Region** | | | | | | | | | |
| 1 | Cows | 3.0 | 3.8 | 163495 | 48284 | 29.5 | 10 % to 20 % | No change | No change |
| 2 | Bufaloes | 6.0 | 2.0 | 54246 | 14181 | 26.1 | 10 % to 20 % | NR | NR |
| 3 | Sheep / Goat | 1.4 | 12.8 | 52310 | 20310 | 38.8 | 20 % to 30 % | No change | NA |
| 4 | Pig | 0.6 | 5.0 | 24098 | 11967 | 49.7 | < 10 % | NR | NR |
| 5 | Poultry | 0.6 | 252.5 | 12538 | 6829 | 54.5 | No change | NR | NR |
| 6 | Insurance of Cattle | 0.9 | 20.3 | 79572 | 31820 | 40.0 | NR | NR | NR |
| 7 | Cattle shed | 3.4 | - | 448116 | 112076 | 25.0 | No change | < 10 % | < 10 % |
| 8 | Fodder Chopper | 0.5 | - | 27227 | 13409 | 49.3 | No change | < 10 % | < 10 % |
| 9 | Milking instruments | 0.4 | - | 95429 | 51801 | 54.3 | 10 % to 20 % | < 10 % | < 10 % |
| 10 | Foggers | 0.8 | - | 6951 | 6929 | 99.7 | No change | No change | No change |
| 11 | Others | 2.9 | - | 42767 | 25977 | 60.7 | No change | No change | < 10 % |
| | TOTAL | 20.6 | - | 130279 | 38279 | 29.4 | < 10 % | < 10 % | < 10 % |

Table 3.5.2A: Impact of animal husbandry on household income

| Sl. No. | Particulars of items | % of beneficiaries | % beneficiary reported increase in income | | | | |
|---|---|---|---|---|---|---|---|
| | | | No change | Less than 10 per cent | 10 to 20 Per cent | 20 to 30 Per cent | Above 30 per cent |
| **South Region** | | | | | | | |
| 1 | Milk | 19 | 10.4 | 25.5 | 38.4 | 15.4 | 10.4 |
| 2 | Milk Products | 0 | 0.0 | 0.0 | 100.0 | 0.0 | 0.0 |
| 3 | Meat | 0 | 0.0 | 50.0 | 0.0 | 50.0 | 0.0 |
| 4 | Egg | 0 | 0.0 | 100.0 | 0.0 | 0.0 | 0.0 |
| 5 | Manure | 19 | 7.6 | 63.9 | 23.5 | 4.7 | 0.4 |
| 6 | Animal sale | 2 | 0.0 | 37.5 | 50.0 | 4.2 | 8.3 |
| 7 | Others | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | TOTAL | 25.5 | 8.6 | 44.4 | 31.7 | 9.9 | 5.5 |
| **Central and West Region** | | | | | | | |
| 1 | Milk | 5.4 | 13.9 | 39.6 | 28.7 | 3.0 | 2.0 |
| 2 | Milk Products | 0.9 | 18.8 | 6.3 | 12.5 | 0.0 | 0.0 |
| 3 | Meat | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 4 | Egg | 0.2 | 75.0 | 25.0 | 0.0 | 0.0 | 0.0 |
| 5 | Skin /Hide Etc. | 0.1 | 0.0 | 0.0 | 100.0 | 0.0 | 0.0 |
| 6 | Manure | 5.0 | 12.8 | 62.8 | 19.2 | 1.1 | 0.0 |
| 7 | Animal sale | 3.1 | 1.7 | 35.6 | 42.4 | 8.5 | 8.5 |
| 8 | Others | 0.2 | 50.0 | 50.0 | 0.0 | 0.0 | 0.0 |
| | TOTAL | 10.0 | 12.5 | 44.4 | 26.9 | 3.2 | 2.5 |
| **East and North East Region** | | | | | | | |
| 1 | Milk | 4.1 | 0.9 | 14.2 | 32.7 | 16.8 | 29.2 |
| 2 | Milk Products | 0.5 | 0.0 | 57.1 | 21.4 | 7.1 | 14.3 |
| 3 | Meat | 1.7 | 6.4 | 23.4 | 14.9 | 23.4 | 17.0 |
| 4 | Egg | 0.8 | 22.7 | 31.8 | 22.7 | 22.7 | 0.0 |
| 5 | Manure | 3.1 | 49.4 | 41.2 | 1.2 | 1.2 | 7.1 |
| 6 | Animal sale | 1.3 | 18.9 | 21.6 | 27.0 | 24.3 | 5.4 |
| 7 | Others | 0.7 | 11.1 | 11.1 | 22.2 | 5.6 | 44.5 |
| | TOTAL | 14.5 | 17.9 | 25.9 | 19.9 | 14.0 | 17.6 |
| **North Region** | | | | | | | |
| 1 | Milk | 12.6 | 10.5 | 34.1 | 36.8 | 10.5 | 7.4 |
| 2 | Milk Products | 1.0 | 45.0 | 35.0 | 20.0 | 0.0 | 0.0 |
| 3 | Meat | 1.0 | 20.0 | 55.0 | 10.0 | 5.0 | 5.0 |
| 4 | Egg | 0.3 | 28.6 | 14.3 | 42.9 | 0.0 | 14.3 |
| 5 | Manure | 12.2 | 36.3 | 59.4 | 2.8 | 1.2 | 0.0 |
| 6 | Animal sale | 3.2 | 10.6 | 34.9 | 31.8 | 10.6 | 10.6 |
| 7 | Others | 0.3 | 0.0 | 66.7 | 33.3 | 0.0 | 0.0 |
| | TOTAL | 20.6 | 22.2 | 45.0 | 21.3 | 6.0 | 4.5 |

Table 3.5.3A Details of feed supplement availed by the beneficiaries under animal husbandry

| Sl. No. | Name of Item | Percentage of beneficiaries | Qty per HH in kg | Total cost per HH in Rs | Subsidy per HH in Rs | Per cent subsidy to total cost |
|---|---|---|---|---|---|---|
| **South Region** | | | | | | |
| 1 | Calcium | 1.8 | 385.6 | 1272 | 1168 | 91.8 |
| 2 | Protein | 6.6 | 245.8 | 3416 | 2429 | 71.1 |
| 3 | Jaggery | 0.0 | 0.0 | 0 | 0 | 0.0 |
| 4 | Azolla | 0.2 | 210.0 | 5933 | 5933 | 100.0 |
| 5 | Fodder seed | 1.9 | 81.8 | 10011 | 5080 | 50.7 |
| 6 | Fodder root cuttings | 0.1 | 35.0 | 13500 | 7000 | 51.9 |
| 7 | Vaccine | 7.5 | 0.4 | 68 | 68 | 100.0 |
| 8 | De-worming tablets | 3.7 | 23.5 | 148 | 148 | 100.0 |
| 9 | Others | 0.5 | 172.4 | 1774 | 1774 | 100.0 |
| | TOTAL | 22.3 | 120.2 | 2166 | 1417 | 65.4 |
| **Central and West Region** | | | | | | |
| 1 | Calcium | 0.5 | 202.2 | 2556 | 1570 | 61.4 |
| 2 | Protein | 0.2 | 70.0 | 1333 | 1141 | 85.6 |
| 3 | Jaggery | 0.0 | 0.0 | 0 | 0 | 0.0 |
| 4 | Azolla | 0.1 | 20.5 | 1595 | 1595 | 100.0 |
| 5 | Fodder seed | 0.0 | 0.0 | 0 | 0 | 0.0 |
| 6 | Fodder root cuttings | 0.0 | 0.0 | 0 | 0 | 0.0 |
| 7 | Vaccine | 0.3 | 1.6 | 890 | 890 | 100.0 |
| 8 | De-worming tablets | 0.2 | 16.7 | 74 | 74 | 100.0 |
| 9 | Others | 0.2 | 0.3 | 17025 | 17025 | 100.0 |
| | TOTAL | 1.4 | 81.9 | 3960 | 3597 | 90.8 |
| **East and North East Region** | | | | | | |
| 1 | Calcium | 1.2 | 24.0 | 1036 | 999 | 96.4 |
| 2 | Protein | 1.2 | 102.0 | 1818 | 1591 | 87.5 |
| 3 | Jaggery | 0.0 | 0.0 | 0 | 0 | 0.0 |
| 4 | Azolla | 0.3 | 67.3 | 14257 | 8632 | 60.5 |
| 5 | Fodder seed | 0.8 | 10.7 | 1603 | 1603 | 100.0 |
| 6 | Fodder root cuttings | 0.0 | 0.0 | 0 | 0 | 0.0 |
| 7 | Vaccine | 0.3 | 1.4 | 1387 | 1237 | 89.2 |
| 8 | De-worming tablets | 0.4 | 1.0 | 459 | 459 | 100.0 |
| 9 | Others | 2.4 | 60.7 | 5808 | 5584 | 96.1 |
| | TOTAL | 6.5 | 50.0 | 3596 | 3207 | 89.2 |
| **North Region** | | | | | | |
| 1 | Calcium | 1.0 | 8.7 | 345 | 310 | 89.7 |
| 2 | Protein | 1.0 | 69.2 | 1278 | 709 | 55.5 |
| 3 | Jaggery | 0.1 | 50.5 | 818 | 818 | 100.0 |
| 4 | Azolla | 0.2 | 38.0 | 946 | 821 | 86.8 |
| 5 | Fodder seed | 0.2 | 19.0 | 343 | 263 | 76.7 |
| 6 | Fodder root cuttings | 0.0 | 0.0 | 0 | 0 | 0.0 |
| 7 | Vaccine | 0.1 | 12.0 | 750 | 750 | 100.0 |
| 8 | De-worming tablets | 0.2 | 63.0 | 2775 | 2775 | 100.0 |
| 9 | Others | 1.1 | 4.6 | 5986 | 5881 | 98.3 |
| | TOTAL | 3.8 | 29.6 | 2360 | 2158 | 91.5 |

Table 4.1A: Benefits received under watershed development and their impacts

| Benefit | % of beneficiary | Avg. cost in Rs | % subsidy | % increase in area | % increase in crop productivity | % decrease in cost | % increase in income |
|---|---|---|---|---|---|---|---|
| **South Region** | | | | | | | |
| Farm ponds / Dug wells | 1.85 | 12913 | 100.0 | < 10 % | < 10 % | 10 to 20 % | < 10 % |
| Diggies | 0.07 | 9800 | 100.0 | < 10 % | < 10 % | < 10 % | 10 to 20 % |
| Total | 1.92 | 12802 | 100.0 | < 10 % | < 10 % | < 10 % | 10 to 20 % |
| **West and Central Region** | | | | | | | |
| Farm ponds / Dug wells | 4.20 | 82530 | 72.8 | < 10 % | 10 to 20 % | < 10 % | 10 to 20 % |
| Diggies | 4.36 | 386171 | 49.5 | > 50 % | 10 to 20 % | > 10 % | 10 to 20 % |
| Check dams | 0.64 | 295222 | 100.0 | 10 to 20 % | 10 to 20 % | 10 to 20 % | 20 to 30 % |
| Community tanks | 0.21 | 108750 | 74.7 | 20 to 30 % | 20 to 30 % | NC | < 10 % |
| Renovation of small tanks | 0.21 | 182500 | 27.4 | 30 to 50 % | NC | < 10 % | NC |
| Pipe / precasted system | 0.85 | 56393 | 33.4 | No change | 10 to 20 % | 10 to 20 % | 10 to 20 % |
| De-silting of ponds / tanks | 0.05 | 100000 | 75.0 | 20 to 30 % | 20 to 30 % | 20 to 30 % | 30 to 50 % |
| Nala bunds | 0.27 | 16759 | 100.0 | 20 to 30 % | 20 to 30 % | 10 to 20 % | 30 to 50 % |
| Land leveling | 0.96 | 25348 | 100.0 | 20 to 30 % | 10 to 20 % | < 10 % | 30 to 50 % |
| Bunding | 0.80 | 75378 | 100.0 | < 10 % | 10 to 20 % | NC | < 10 % |
| Others | 0.05 | 17721 | 100.0 | < 10 % | < 10 % | < 10 % | 10 to 20 % |
| Total | 12.61 | 192339 | 58.2 | < 10 % | 10 to 20 % | < 10 % | 10 to 20 % |
| **East and North East Region** | | | | | | | |
| Farm ponds / Dug wells | 0.36 | 44500 | 45.0 | NC | <10 % | <10 % | <10 % |
| Diggies | 0.07 | 65000 | 69.2 | <10 % | <10 % | <10 % | 10 to 20 % |
| Check dams | 0.29 | 75625 | 90.7 | No change | <10 % | <10 % | 20 to 30 % |
| Lining of tanks | 0.65 | 120389 | 70.7 | <10 % | <10 % | <10 % | 10 to 20 % |
| Community tanks | 0.18 | 381600 | 99.6 | NC | <10 % | <10 % | 10 to 20 % |
| Renovation of small tanks | 0.40 | 49364 | 77.4 | 10 to 20 % | <10 % | NC | 10 to 20 % |
| Total | 2.08 | 100310 | 82.1 | <10 % | <10 % | <10 % | 10 to 20 % |
| **North Region** | | | | | | | |
| Farm ponds / Dug wells | 0.10 | 87500 | 64.3 | <10 % | <10 % | No change | <10 % |
| Diggies | 0.05 | 70000 | 51.4 | <10 % | 10 to 20 % | <10 % | 10 to 20 % |
| Lining of tanks / ponds | 1.41 | 105823 | 38.4 | <10 % | <10 % | <10 % | 10 to 20 % |
| Renovation of tanks | 0.24 | 48812 | 47.3 | 10 to 20 % | <10 % | <10 % | <10 % |
| Pipe / precasted system | 0.34 | 80414 | 45.2 | 20 to 30 % | 20 to 30 % | <10 % | 10 to 20 % |
| Desilting of ponds / tanks | 0.54 | 148171 | 37.4 | <10 % | <10 % | <10 % | <10 % |
| Percolation tanks | 0.10 | 100000 | 40.7 | <10 % | 10 to 20 % | NC | <10 % |
| Nala Bunds | 0.05 | 174210 | 9.9 | 10 to 20 % | 10 to 20 % | NC | 10 to 20 % |
| Others | 0.05 | 150000 | 25.5 | NC | <10 % | <10 % | 10 to 20 % |
| Total | 2.88 | 106355 | 39.0 | <10 % | <10 % | <10 % | 10 to 20 % |

Table 4.2A: Benefits received under soil testing and related programmes of NRM sector

| Benefit | % of beneficiaries | Avg. cost in Rs. | % subsidy | % increase in productivity | % decrease in cost | % increase in income | % of HH having improvement in soil health |
|---|---|---|---|---|---|---|---|
| **South Region** | | | | | | | |
| Drainage | 0.07 | 400000 | 100.0 | 10 to 20 % | 10 to 20 % | 20 to 30 % | 100.0 |
| Micronutrients applied | 0.07 | 5000 | 100.0 | 20 to 30 % | 10 to 20 % | No change | 100.0 |
| Total | 0.14 | 202500 | 100.0 | 10 to 20 % | 10 to 20 % | No change | 100.0 |
| **West and Central Region** | | | | | | | |
| Lime / Gypsum applied | 0.2 | 9025 | 100.0 | <10 % | <10 % | <10 % | 100.0 |
| Others | 0.1 | 10000 | 19.0 | <10 % | No change | 10 to 20 % | 100.0 |
| Total | 0.3 | 9350 | 71.1 | <10 % | <10 % | <10 % | 100.0 |
| **East and North East Region** | | | | | | | |
| Lime / Gypsum applied | 0.8 | 7380 | 99.1 | 10 to 20 % | 20 to 30 % | 30 to 50 % | 76.2 |
| Leaching with good water | 0.1 | 7667 | 85.7 | No change | No change | 30 to 50 % | 66.7 |
| Drainage | 0.0 | 5000 | 100.0 | > 50 % | No change | 30 to 50 % | 100.0 |
| Use of tolerant varieties | 0.1 | 3250 | 100.0 | 20 to 30 % | <10 % | 10 to 20 % | 0.0 |
| Micronutrients applied | 0.1 | 10500 | 84.6 | 30 to 50 % | 30 to 50 % | 30 to 50 % | 100.0 |
| Others | 1.2 | 39478 | 55.0 | No change | No change | <10 % | 18.8 |
| Total | 2.2 | 23940 | 61.0 | > 50 % | No change | 30 to 50 % | 45.2 |
| **North Region** | | | | | | | |
| Lime / Gypsum applied | 0.4 | 218 | 100.0 | <10 % | <10 % | <10 % | 100.0 |
| Drainage | 0.1 | 360 | 100.0 | <10 % | <10 % | <10 % | 100.0 |
| Use of tolerant varieties | 0.1 | 360 | 100.0 | No change | <10 % | No change | 100.0 |
| Micronutrients applied | 0.3 | 221 | 100.0 | <10 % | No change | <10 % | 100.0 |
| Others | 0.1 | 300 | 100.0 | 10 to 20 % | <10 % | 10 to 20 % | 100.0 |
| Total | 0.9 | 239 | 100.0 | <10 % | <10 % | <10 % | 100.0 |

Table 4.3A: Organic farming details for major crops

| Benefit | % of beneficiaries whose land was treated | Area (acres) | Quantity applied (Qtls.) | Avg cost Rs. | % Subsidy | % increase in crop productivity | % decrease in cost | % increase in income |
|---|---|---|---|---|---|---|---|---|
| **South Region** | | | | | | | | |
| FYM | 0.8 | 4 | 649 | 0 | 0.0 | <10 % | <10 % | <10 % |
| Vermi-compost | 2.9 | 3 | 799 | 11360 | 0.0 | 10 to 20 % | No change | 10 to 20 % |
| Others | 0.1 | 1 | 4000 | 0 | 0.0 | 20 to 30 % | 10 to 20 % | 20 to 30 % |
| Bio-fertilizers | 0.1 | 1 | 2000 | 0 | 0.0 | 20 to 30 % | <10 % | 20 to 30 % |
| Green Manures | 0.6 | 2 | 281 | 1995 | 0.0 | 10 to 20 % | No change | <10 % |
| Others | 0.1 | 6 | 7 | 1500 | 0.0 | 20 to 30 % | No change | 10 to 20 % |
| Total | 4.5 | 3 | 713 | 7784 | 0.0 | <10 % | No change | <10 % |
| **Central and Western Region** | | | | | | | | |
| FYM | 0.2 | 4 | 300 | 3750 | 50 | <10 % | <10 % | <10 % |
| Vermi-compost | 2.3 | 4 | 312 | 1432 | 56.4 | <10 % | <10 % | 10 to 20 % |
| Others | 0.2 | 6 | 255 | 4750 | 0 | <10 % | <10 % | 10 to 20 % |
| Total | 2.8 | 4 | 305 | 1865 | 44.3 | <10 % | <10 % | 10 to 20 % |
| **East and North Eastern Region** | | | | | | | | |
| FYM | 0.1 | 1 | 3333 | 0 | 0 | No change | No change | No change |
| Vermi-compost | 1.9 | 1 | 673 | 3305 | 41.6 | <10 % | <10 % | <10 % |
| Others | 0.0 | 0 | 3200 | 0 | 0 | 10 to 20 % | No change | 10 to 20 % |
| Others | 0.1 | 1 | 1190 | 5000 | 40 | <10 % | <10 % | <10 % |
| Total | 2.2 | 1 | 768 | 3141 | 41.5 | <10 % | <10 % | <10 % |
| **North Region** | | | | | | | | |
| FYM | 1.7 | 1 | 717 | 882 | 50 | <10 % | <10 % | <10 % |
| Vermi-compost | 7.6 | 2 | 569 | 3045 | 69.4 | <10 % | <10 % | <10 % |
| Bio-fertilizers | 0.2 | 1 | 200 | 395 | 100 | <10 % | <10 % | 10 % to 20 % |
| Green Manures | 0.8 | 4 | 386 | 1370 | 61.7 | <10 % | <10 % | <10 % |
| Others | 0.2 | 3 | 672 | 560 | 42.1 | <10 % | No change | <10 % |
| Total | 10.5 | 2 | 556 | 2471 | 67.9 | <10 % | <10 % | <10 % |

Table 4.4A: Overall Impact of Organic Farming

| Total Impact of intervention | % beneficiaries reported | | | | |
|---|---|---|---|---|---|
| | No change | <10% | 10 to 20 % | 20 to 30 % | Above 30 % |
| **South Region** | | | | | |
| Increase in crop productivity | 1.5 | 41.5 | 41.5 | 13.9 | 1.5 |
| Increase in income | 40.0 | 29.2 | 23.1 | 3.1 | 4.6 |
| Decrease in cost of production | 1.5 | 46.2 | 32.3 | 9.2 | 10.8 |
| **Central and Western Region** | | | | | |
| Increase in crop productivity | 5.8 | 59.6 | 34.6 | 0.0 | 0.0 |
| Increase in income | 32.7 | 61.5 | 3.9 | 0.0 | 0.0 |
| Decrease in cost of production | 9.6 | 30.8 | 55.8 | 3.9 | 0.0 |
| **East and North East Region** | | | | | |
| Increase in crop productivity | 3.3 | 63.3 | 20.0 | 1.7 | 1.7 |
| Increase in income | 15.0 | 68.3 | 3.3 | 1.7 | 1.7 |
| Decrease in cost of production | 5.0 | 53.3 | 26.7 | 5.0 | 0.0 |
| **North Region** | | | | | |
| Increase in crop productivity | 5.1 | 62.8 | 27.4 | 2.8 | 1.9 |
| Increase in income | 26.5 | 67.4 | 4.7 | 1.4 | 0.0 |
| Decrease in cost of production | 4.2 | 51.6 | 36.7 | 5.6 | 1.9 |

Table 5.1A: Training to beneficiaries - All India

| Sl. No. | Region | Percentage of beneficiaries undergone training | Avg. no of days of training | Type of training (%) | | | | Percentage of farmers who found training helped adoption |
|---|---|---|---|---|---|---|---|---|
| | | | | Demonstration | Field visit | Krishi mela | Others | |
| **South Region** | | | | | | | | |
| 1 | Andhra Pradesh | 48.0 | 2 | 46.7 | 50.8 | 0.0 | 2.5 | 93.3 |
| 2 | Goa | 31.0 | 3 | 58.1 | 25.8 | 6.5 | 9.7 | 100.0 |
| 3 | Karnataka | 9.7 | 2 | 20.0 | 36.7 | 36.7 | 6.7 | 100.0 |
| 4 | Kerala | 16.4 | 3 | 73.2 | 24.4 | 0.0 | 2.4 | 95.1 |
| 5 | Tamil Nadu | 26.7 | 2 | 27.5 | 65.0 | 0.0 | 7.5 | 95.0 |
| 6 | Puduchery | 78.0 | 2 | 46.2 | 41.0 | 0.0 | 12.8 | 100.0 |
| 7 | A & N Islands | 26.0 | 3 | 51.3 | 33.3 | 2.6 | 12.8 | 97.4 |
| **West and Central Region** | | | | | | | | |
| 8 | Chhattisgarh | 9.2 | 4 | 26.1 | 56.5 | 13.0 | 4.4 | 82.6 |
| 9 | Gujarat | 28.9 | 2 | 9.8 | 13.9 | 36.9 | 39.4 | 75.4 |
| 10 | Madhya Pradesh | 7.4 | 3 | 21.6 | 16.2 | 40.5 | 21.6 | 86.5 |
| 11 | Maharashtra | 14.9 | 4 | 13.5 | 25.0 | 34.6 | 26.9 | 0.0 |
| 12 | Rajasthan | 42.2 | 3 | 20.5 | 2.7 | 3.3 | 73.5 | 80.8 |
| **East and North Eastern Region** | | | | | | | | |
| 13 | Arunachal Pradesh | 16.0 | 1 | 66.7 | 0.0 | 0.0 | 33.3 | 66.7 |
| 14 | Assam | 13.4 | 4 | 82.1 | 14.3 | 3.6 | 0.0 | 100.0 |
| 15 | Bihar | 11.8 | 3 | 31.9 | 53.2 | 8.5 | 6.4 | 76.6 |
| 16 | Jharkhand | 23.2 | 6 | 50.0 | 36.2 | 6.9 | 6.9 | 67.2 |
| 17 | Manipur | 30.0 | 3 | 88.6 | 4.3 | 0.0 | 7.2 | 97.1 |
| 18 | Mizoram | 8.2 | 2 | 60.0 | 35.0 | 0.0 | 5.0 | 85.0 |
| 19 | Nagaland | 40.8 | 1 | 98.6 | 1.5 | 0.0 | 0.0 | 66.7 |
| 20 | Orissa | 24.7 | 3 | 50.0 | 43.2 | 6.8 | 0.0 | 98.7 |
| 21 | Sikkim | 46.0 | 3 | 56.5 | 25.0 | 0.0 | 18.5 | 95.7 |
| 22 | Tripura | 23.3 | 4 | 59.5 | 31.0 | 0.0 | 9.5 | 76.2 |
| 23 | West Bengal | 26.4 | 6 | 86.4 | 6.1 | 0.0 | 7.6 | 97.0 |
| **North Region** | | | | | | | | |
| 24 | Haryana | 8.8 | 4 | 4.6 | 72.7 | 9.1 | 13.6 | 81.8 |
| 25 | Himachal Pradesh | 27.2 | 5 | 30.9 | 50.0 | 8.8 | 10.3 | 89.7 |
| 26 | Jammu and Kashmir | 31.2 | 3 | 44.9 | 30.8 | 12.8 | 11.5 | 87.2 |
| 27 | Punjab | 41.6 | 11 | 51.9 | 10.6 | 24.0 | 13.5 | 92.3 |
| 28 | Uttar Pradesh | 15.4 | 4 | 34.2 | 38.2 | 8.9 | 18.7 | 70.7 |
| 29 | Uttarkhand | 13.2 | 3 | 18.2 | 54.6 | 15.2 | 12.1 | 72.7 |

Table 5.2A: Annual employment generations under RKVY program

| States/UTs | Employment generated (days/annum) | | | Modal Response | |
|---|---|---|---|---|---|
| | Own | Hired | Total | % increase in employment_ own | % increase in employment_ hired |
| Andhra Pradesh | 6 | 5 | 11 | < 10% | - |
| A & N Islands | 9 | 8 | 17 | < 10% | - |
| Goa | 11 | 11 | 22 | No Change | - |
| Karnataka | 11 | 16 | 27 | < 10% | < 10% |
| Kerala | 9 | 14 | 23 | No Change | < 10% |
| Puducherry | 7 | 12 | 19 | No Change | - |
| Tamil Nadu | 8 | 7 | 15 | < 10% | - |
| **South Region** | **9** | **10** | **19** | **< 10%** | **-** |
| Chattishgarh | 5 | 3 | 8 | No Change | - |
| Gujarat | 8 | 5 | 12 | No Change | < 10% |
| Madhya Pradesh | 5 | 7 | 12 | < 10% | < 10% |
| Maharashtra | 6 | 7 | 12 | < 10% | < 10% |
| Rajasthan | 1 | 2 | 3 | 0 | - |
| **West & Central Region** | **5** | **5** | **10** | **< 10%** | **-** |
| Arunachal Pradesh | 6 | 6 | 11 | No Change | No Change |
| Assam | 2 | 8 | 11 | 10-20% | 10-20% |
| Bihar | 5 | 7 | 12 | No Change | No Change |
| Jharkhand | 5 | 4 | 9 | No Change | - |
| Manipur | 3 | 8 | 11 | No Change | - |
| Meghalaya | 3 | 5 | 8 | No Change | No Change |
| Mizoram | 7 | 6 | 14 | No Change | No Change |
| Nagaland | 3 | 3 | 6 | No Change | No Change |
| Orissa | 5 | 4 | 9 | No Change | - |
| Sikkim | 5 | 7 | 12 | No Change | < 10% |
| Tripura | 7 | 7 | 14 | 10-20% | 10-20% |
| West Bengal | 5 | 7 | 12 | No Change | No Change |
| **East & North-East Region** | | **6** | **6** | **No Change** | **No Change** |
| Haryana | 5 | 7 | 12 | No Change | < 10% |
| Himachal Pradesh | 5 | 4 | 8 | No Change | - |
| Jammu and Kashmir | 5 | 4 | 9 | No Change | - |
| Punjab | 5 | 5 | 10 | No Change | No Change |
| Uttar Pradesh | 0 | 0 | 1 | 0 | - |
| Uttarakhand | 4 | 1 | 5 | < 10% | - |
| **North Region** | **6** | **6** | **12** | **No Change** | **-** |
| **All India** | **6** | **5** | **11** | **No Change** | **-** |

Table 5.3A: Marketing details of RKVY beneficiaries

| Sl. No. | States | Avg. amount of sale (Rs per hh) | % of beneficiaries marketing channels | | | % of beneficiaries selling through different agents | | | Average distance covered for the sale |
|---|---|---|---|---|---|---|---|---|---|
| | | | Village market | APMC Mandi | Private and others | Commission agent | Govt. Agency | Private traders and other | |
| 1 | Andhra Pradesh | 88883 | 52.03 | 4.06 | 43.54 | 25.09 | 5.17 | 69.37 | 9.92 |
| 2 | Goa | 115007 | 52.76 | 4.91 | 9.82 | 1.23 | 42.33 | 55.83 | 6.53 |
| 3 | Karnataka | 123577 | 18.96 | 53.00 | 21.76 | 48.20 | 3.07 | 48.73 | 19.50 |
| 4 | Kerala | 64634 | 74.48 | 3.79 | 19.31 | 23.79 | 16.90 | 58.62 | 5.05 |
| 5 | Tamil Nadu | 110690 | 25.90 | 9.09 | 61.98 | 12.67 | 7.71 | 77.69 | 12.70 |
| 6 | Puducherry | 63170 | 1.87 | 36.45 | 61.68 | 0.00 | 42.99 | 57.01 | 7.78 |
| 7 | A & N Islands | 60313 | 56.99 | 9.68 | 32.26 | 26.34 | 1.61 | 69.89 | 5.99 |
| 8 | Chhattisgarh | 62054 | 21.31 | 16.39 | 62.30 | 9.84 | 6.56 | 82.79 | 9.11 |
| 9 | Gujarat | 22699 | 45.77 | 36.68 | 14.37 | 31.83 | 13.14 | 51.06 | 11.61 |
| 10 | Madhya Pradesh | 110296 | 15.40 | 48.67 | 35.93 | 6.55 | 33.98 | 59.47 | 13.09 |
| 11 | Maharashtra | 78368 | 15.92 | 16.52 | 67.57 | 13.81 | 11.71 | 74.47 | 12.69 |
| 12 | Rajasthan | 112843 | 28.18 | 51.79 | 15.31 | 46.42 | 6.03 | 43.32 | 14.77 |
| 13 | Arunachal Pradesh | 38014 | 79.53 | 2.36 | 17.32 | 0.00 | 0.00 | 100.00 | 3.78 |
| 14 | Assam | 59434 | 69.44 | 2.78 | 25.00 | 0.00 | 1.39 | 98.61 | 8.37 |
| 15 | Bihar | 23986 | 32.92 | 10.97 | 55.11 | 13.47 | 8.98 | 76.31 | 5.95 |
| 16 | Jharkhand | 99277 | 47.85 | 7.98 | 44.17 | 0.61 | 6.13 | 93.25 | 5.31 |
| 17 | Manipur | 19663 | 54.29 | 0.00 | 42.86 | 0.00 | 0.00 | 82.86 | 2.24 |
| 18 | Meghalaya | 25708 | 63.64 | 0.00 | 27.27 | 0.00 | 0.00 | 85.71 | 4.74 |
| 19 | Mizoram | 11053 | 25.00 | 12.50 | 43.75 | 0.00 | 12.50 | 87.50 | 4.31 |
| 20 | Nagaland | 9489 | 76.83 | 0.61 | 22.56 | 0.61 | 98.78 | 99.39 | 21.14 |
| 21 | Orissa | 63888 | 21.72 | 3.00 | 22.85 | 14.61 | 77.15 | 100.00 | 4.71 |
| 22 | Sikkim | 97895 | 30.23 | 20.47 | 49.30 | 1.40 | 9.30 | 89.30 | 8.53 |
| 23 | Tripura | 325290 | 77.78 | 0.00 | 14.44 | 0.00 | 1.11 | 93.33 | 5.46 |
| 24 | West Bengal | 54538 | 55.35 | 8.81 | 35.22 | 1.89 | 3.14 | 93.08 | 5.50 |
| 25 | Haryana | 139746 | 16.51 | 44.81 | 38.68 | 6.13 | 37.74 | 55.66 | 10.13 |
| 26 | Himachal Pradesh | 232860 | 32.70 | 7.11 | 60.19 | 8.06 | 5.69 | 86.26 | 23.30 |
| 27 | Jammu and Kashmir | 38521 | 41.07 | 11.60 | 47.02 | 2.19 | 6.90 | 90.60 | 9.12 |
| 28 | Punjab | 471421 | 25.71 | 22.38 | 51.43 | 2.38 | 30.00 | 67.14 | 10.25 |
| 29 | Uttar Pradesh | 186079 | 43.60 | 13.26 | 42.47 | 2.47 | 15.06 | 82.02 | 5.34 |
| 30 | Uttarakhand | 42021 | 43.75 | 6.25 | 50.00 | 0.57 | 13.64 | 85.80 | 5.52 |
| | ALL INDIA | 95367 | 36.83 | 23.86 | 35.06 | 17.58 | 12.40 | 68.55 | 10.79 |

Table 6.1A: Institutional/Infrastructure projects details

**NORTH REGION**

**Output & outcome (Haryana)**

| Activity | Expected output | Actual output | Expected outcome | Actual outcome |
|---|---|---|---|---|
| **Research (Agri/Horti/Animal Husbandry)** | | | | |
| Strengthening of labs | Development of laboratory facilities for feed and mineral mixture quality evaluation | Laboratories strengthened | Benefits to the livestock owners | To be assessed |
| Providing of diagnostic services | Diagnosis, prevalence, etiology and control of mastitis in Haryana | Diagnosis, and control of mastitis in Haryana being carried out | Treatment for livestock | As expected |
| Any other | Nanobody drug produced with biotechnological tools for treatment of endotoxemia in animals | Nanobody clones produced & partially characterized | A life-saving drug for an economically important animal disease | Important parameters for nanobody drug develop-ment collected |
| Strengthening of labs | Strengthening of immune-technology lab. | Sophisticated instruments added to the lab. | Immuno-technology Lab. is established | Well-equipped Immuno-technology Lab for production of immuno-biologicals |
| Infrastructure facilities in universities | Infrastructure/teaching facilities in universities | Infrastructure/teaching facilities in university | Boosting of PG research & teaching | Modern methods being demonstrated in the lab. |
| Infrastructure facilities in universities | Development of mechanical detorsion device for correction of uterine torsion in buffaloes | Mechanical detorsion device for correction of uterine torsion in buffaloes is under development | Treatment for livestock | To be assessed |
| Diagnostic aids | Veterinary early assessment of pregnancy and understanding the causes of infertility | Veterinary early assessment of pregnancy and understanding the causes of infertility | Treatment for livestock | To be assessed |
| Strengthening of labs | Strengthening of Disease Diagnostic Services and Surveillance | Disease Diagnostic Services and Surveillance strengthened | Diagnosis and treatment for livestock | Diagnosis and treatment for livestock |

| | | | | |
|---|---|---|---|---|
| Strengthening of labs | Development of Molecular tools for the control of Peste des petits ruminants, Bluetongue and Capripox viruses in Haryana, India | Laboratories strengthened | Benefits to the livestock owners | To be assessed |
| **Micro/ Minor irrigation** | | | | |
| Water management | Increase in cropping intensity From 165% to 185 % | increase in productivity | increase in productivity achieved in wheat Paddy oilseed & pulses | NA |
| Water management | To bring additional area under cultivation | Increase of 3% area per acre observed | An area of 90604 ha & 65555 ha brought under UGPL & sprinkler System respectively | |
| **Horticulture** | | | | |
| Organic farming | Promotion of organic way of farming. | Promotion of organic way of farming. | Reduction in pesticide residue effect in fruit, vegetable, soil and water | Reduction in pesticide residue effect in fruit, vegetable, soil and water |
| NA | Increase in Vegetable Production and Productivity. To provide Vigorous and Diseases free seedlings. | Increased Vegetable Production & Productivity | Increase in Production and Productivity of Vegetable crops. | Increased Production and Productivity of Vegetable crops. |
| Post harvest management | Preventing Post Harvest Losses, Transportation of vegetable to avoid brushing and to increase self life of vegetable. Marketing in distant market | Less loses after post harvest of fruits & vegetables | Minimize the Post Harvest losses | Increased production, productivity of Mushroom |

| | | | | |
|---|---|---|---|---|
| Training & capacity buiding | To demonstrate the new technologies for Papaya and Banana cultivation especially for frost protection. To meet the demand of planting material for Papaya and Banana crops. Increase in production and productivity of Fruits. | Project is under process | The increase in area and production of Papaya and Banana. | Project is under process |
| Hybrid seed development | Increased Production, productivity of vegetable | Increase in production, productivity of vegetable | Increased production leads to upliftment of farming community | increase in production leads to upliftment of farming community |
| **Natural resource management** | | | | |
| Laying of sub-surface drainage system to reclaim saline/ water logged soils | Reclaimation of saline water logged soils, Increase in crop productivity, Enchancement if land value | NA | Decrease in water logging & soil salinity, More land comes under cultivation | As expected outcome |

## Output & outcomes (Himachal Pradesh)

| | Expected output | Actual output | Expected outcome | Actual outcome |
|---|---|---|---|---|
| **Agricultural Mechanization** | | | | |
| Development of low cost machinery | To promote new gender friendly implements for farming women. | 13,521 new implements / tools distributed to farm women. | Reduction in labour cost of farmers. Increase in production and productivity. | Increased production & productivity by reducing the labour cost & improving the working efficiency of farm women. |
| **Animal Husbandry** | | | | |
| Breed development & conservation | Immunogenetic chracterization of desi cow | Several parameters pertaining to immunogenetics of cattle were determined | Scientific understanding about the basis of better disease resistance in hill cattle vis-à-vis exotic crosses | Scientific understanding about the basis of better disease resistance in hill cattle vis-à-vis exotic crosses |
| Stray cattle programme | The stray cattle population in Himachal Pradesh has risen significantly. Farmers are abandoning their cows and suffering heavy economic losses. The work was proposed to investigate possible causes of the problem and to treat them to reduce the stray animal population. | The reasons compelling the owner to abandon their cattle were identified. | The farmers of the entire state shall benefit from the outcome of the study. The findings shall provide guidelines for improving production potential of the cows and prevent heavy economic loses borne by the farmers. The conclusions drawn shall be applicable to overcome the growing menace of stray cattle. | Reduction in stray cattle population in the state can be achieved by adopting proper managemental practices providing adequate nutrition and improving AI skills of personals involved in AI programme. |

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| | Estimation of causes of post-partum anestrus. The package of practices shall be suggested to be implementing agency. | Reduced postpartum anestrus interval by adopting scientific managemental practices. | Findings shall provide guidelines for improving reproductive efficiency of cows of H.P. The farmers of entire state shall benefit from the outcome of the study. | Findings shall provide guidelines for improving reproductive efficiency of cows of H.P. The farmers of entire state shall benefit from the outcome of the study. |
| | One of the major reasons for poor reproductive performance is faulty AI/Semen handling. The refresher training to field staff shall help in improving AI skills of inseminators and help improving reproductive performance of the cattle and buffaloes. | 319 pharmacists were trained in fifteen trainings from ten districts of H.P. | The technical upgradation of skill of AI personnel will help significantly reduce the incidence of infertility and thus stray animal population. | Improvement in the AI skill of Pharmacist's of H.P. Reduction in the infertility and stray animal population. |
| Fodder development | To provide assistance (50%) for the purchase seeds of Rabi fodder crops. | Improved seeds of Rabi fodder crops i.e. berseem 1528 qtl. & oats 820 qtl distributed @50% cost | To ensure the availability of green fodder. To increase area under fodder cultivation. | Availability of green fodder ensured. Increased area under fodder cultivation |
| Seed development | To provide assistance (50%) for the purchase seeds of fodder crops. | Improved seeds of fodder crops like berseem 1818 qtl., oats 1114 qtl., Sorghum 4202 qtls. & Bajra 516 qtls. distributed @50% cost | To ensure the availability of green fodder throughout the year. To increase area under fodder cultivation. | Ensured the availability of green fodder throughout the year. Increased area under fodder cultivation |
| **Crop Development** | | | | |
| Seed development | To distribute 15000 qtl. hybrid maize seed to increase the production. | 16572 qtl. hybrid maize seed distributed | To increase the production / productivity of maize crop. | Increased production / productivity of Maize crop. |

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| Seed development | To distribute hybrid maize seed amongst the farmers of the state. To train the farmers on maize production technology. | Distributed 17463 qtls. hybrid maize seed to the farmers. Trained farmers on Maize production technology through demonstrations on farmers field. | To enhance the productivity of maize. | Assistance given for enhancement of productivity in maize by distributing 17463 qtls. hybrid seed. |
| System of Rice Intensification | To promote the adoption of SRI wheat technique amongst the farmers of the State. | 3966 farmers adopted SRI wheat technique covering an area of 200 ha. | To increase the production & productivity of wheat. | Increased production & productivity of wheat. |
| Seed development | To provide assistance (50%) for the purchase seeds of fodder crops. | Improved seeds of fodder crops like berseem 1850 qtl., oats 1372 qtl., Sorghum 4891 qtls. & Bajra 88 qtls. distributed at 50% cost | To ensure the availability of green fodder throughout the year. To increase area under fodder cultivation. | Ensured the availability of green fodder throughout the year. Increased area under fodder cultivation |
| System of Rice Intensification | To promote the adoption of SRI in Paddy technique amongst the farmers of the State. | 9317 farmers adopted SRI technique in Paddy crop covering an area of 616.22 ha. with productivity 7.4 t/ha. | To increase the production & productivity of Paddy. | Increased production & productivity of Paddy. |

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| Vegetable cultivation | To enhance seed production. To promote vegetable cultivation in open & protected cover. Promotion of INM, IPM & Organic Farming. Training & capacity building of farmers. Formation of farmers association / groups. | Vegetable seed production on 5.5 ha area. Vegetable cultivation promoted on 1510 ha. area in open conditions & 10 ha. under polyhouse. INM / IPM promoted on 990 ha. area and organic farming promoted on 1000 ha. area. 7,200 farmers trained regarding vegetable cultivation. 72 Nos. farmers groups formed | Strengthening of farmer groups. Increase in production / productivity of vegetable. Capacity building of vegetable growers. | Vegetable growers organized into groups. Production / Productivity of vegetable increased thus maintaining the supply chain. Capacity building of vegetable growers ensured. |
| **Extension** | | | | |
| Training and capacity building | Formation of 65 women groups, assistance & training to link workers, capacity building of women groups, 11 exposure visits & 8 Mahila Gosthies to be organized. | 65 women groups formed. Seed money given to 99 groups. 91 link workers trained. Capacity building of 51 groups, assistance for result demonstrations (325 no.). 11 exposure visits. 8 mahila gosthis organized. | Improvement in productivity thereby increase in farm production & income. Reduce gender bias. mprovement in decision making capacity. | Improved productivity., Reduced gender bias, Improved decision making capacity |
| Training & capacity buiding | Formation of 680 women groups & their capacity building etc. | 680 women groups formed & training on different aspects for their capacity building and other related activities taken up. | Reduce gender bias. Improvement in decision making capacity. | Gender bias reduced. Decision making capacity improved. Self employment at farm. |
| Training & capacity buiding | To strengthen infrastructural facilities. | Strengthened infrastructural facilities at SAMETI, Mashobra. | To modernize & strengthen training / capacity building facilities. | Improved training / capacity building facilities. |

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| Strengthening of labs | To establish mobile agri-clinical laboratories for strengthening of extension services. To strengthen farmers hostel facilities at HPKV, Palampur. | Established 3 Nos. mobile agri-clinical laboratories. Strengthened farmers hostel of State Agriculture University. | To improve extension services. | Extension services strengthened. |
| Organic farming | Setting up of 4,000 Vermi Compost units. | 4,053Vermi Compost units set up. | To reduce the use of chemical fertilizers. To improve the physical & biological properties of Soils. To promote eco friendly farming | Saving of chemical fertilizers. Improved soil fertility, porosity, water infiltration, water holding capacity. Ecofriendly farming promoted. |
| Strengthening of labs | To establish mobile agri-clinical laboratories for strengthening of extension services. | Established 2 Nos. mobile agri-clinical laboratories. | To improve extension services. | Extension services improved. |
| Infrastructure /teaching facilities in universities | To strengthen farmers hostel facilities at HPKV, Palampur. | Strengthened farmers hostel of HPKV, Palampur. | To improve extension services. | Extension services improved. |
| Vegetable cultivation | To strengthen Farmers Training Centre, Sundernagar. | Strengthened FTC, Sundernagar. | To increase the infrastructural facilities for training of farmers and extension functionaries. | Improved infrastructural facilities for capacity building of farmers and extension functionaries. |
| **Fertilizers & INM** | | | | |
| Soil fertility Maps | Soil analysis of 26,000 soil samples | Data entry for GIS based map preparation is going on | Soil analysis of 26,000 soil samples | Soil fertility maps of all the blocks of HP |
| Strengthening of labs | Strengthening of 11 Soil Testing Labs. | 11 Soil Testing Labs strengthened. | To enhance the capacity / efficiency of soil testing laboratories. | Sample analyzing capacity / efficiency of soil testing laboratories enhanced. |

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| Organic farming | To setup vermibeds & distribution of soil health cards. | 3,000 vermi beds setup & 50,000 soil health cards distributed. | Reduction in the use of synthetic / inorganic fertilisers. Improvement in the physical & biological properties of soil. | Reduced use of inorganic fertilisers. Improved soil fertility, porosity, water infiltration & water holding capacity. |
| **Fisheries** | | | | |
| Seed development | To strengthen 20 Nos. seed multiplication farms. | 20 Nos. seed multiplication farms strengthened. | By strengthening the seed farms, the production of foundation & certified seed would increase. Availability of quality certified seed of different crops to the farmers. Seed Replacement rate will increase. | Increased production of foundation and certified seeds. Quality certified seeds of different crops were made available to the farmers. Seed replacement rate increased. |
| **Horticulture** | | | | |
| Protected Cultivation | To provide assistance for low, medium & high tech green houses and cover 17,400 sq.m area. To bring 81 ha under area expansion of vegetables. To train farmers under protected cultivation technologies & organize exposure visits. | Assistance given for low, medium & high tech green houses in 17400sq.m. 81 ha area expanded under vegetables. 1500 farmers trained. Exposure visits of 534 farmers organized | To create a favourable environment for sustained growth of the crop so as to realize its maximum potential even in adverse climatic conditions. Self employment opportunities for rural youths, increased farm income. | Sustained growth of the crops achieved. Created self employment opportunity for rural youths. Training on protected cultivation alongwith exposure visits of the farmers to the state accomplished. |

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| Vegetable cultivation | To cover about 7 ha. area under protected cultivation for growing vegetables. | Covered 7.734 ha. area under protected cultivation for growing vegetables. | To provide assured employment to farming youths.To achieve higher productivity of vegetables. Higher income and change in socio-economic status of Small and marginal farmers. | Provided employment to farming youth & local artisans.Increased production of vegetable under protected cultivation leading to increase in income and change in socio economic status of small & marginal farmers. |
| **Innovative Program/Training/ capacity/ building/others** | | | | |
| Training & capacity buiding | NA | Formation of 350 women groups & their capacity building etc. | 352 women groups formed & training on different aspects for their capacity building and other related activities taken up. | Reduce gender bias. Improvement in decision making capacity. |
| Training & capacity buiding | Assistance & training to link workers, capacity building of women (220 Nos.), 50 exposure visits, 18 Mahila Gosthies & 60 exhibitions to be organized. | 1030 link workers trained. Capacity building of women on group management & support services (222 Nos.). 54 exposure visits. 18 Mahila Gosthies organized. 58 exhibitions organized. | Improvement in productivity thereby increase in farm production & income. Reduce gender bias. Improvement in decision making capacity | Improved productivity thus increased farm income. Reduced gender bias. Improved decision making capacity. |
| **Integrated Pest Management** | | | | |
| Strengthening of labs | 1 No. Pesticide Laboratory to be strengthened. | Strengthened one pesticide testing laboratory. | To enhance the efficiency of lab & to ensure supply of quality pesticides to the farmers. | Enhanced efficiency of lab & supply of quality pesticides to the farmers. |
| Strengthening of labs | Four labs to be strengthened. | Four departmental labs Strengthened. | To enhance the efficiency of labs | Efficiency of labs enhanced. |

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| Vegetable cultivation | To organize training & demonstrations on seed treatment of wheat to prevent yellow rust disease. Distribution of 15,000 mini kits, literature to create awareness about the disease amongst farming community. | Organized 191 Nos. trainings, 4,000 demonstrations laid & provided 999 ltr. fungicide on 50% cost to the wheat growers. 16,777 Nos. mini kit trials, 1 lakh cards / leaflets showing symptoms of yellow rust disease distributed. | Increase in production and productivity of Wheat. Reduction in build up of inoculum of Yellow rust. Replacement of yellow rust susceptible varieties with resistant varieties of Wheat. | Increased production & productivity of wheat by minimizing yellow rust disease incidence. |
| Strengthening of labs | To strengthen state pesticide testing lab & bio-pesticide lab. | Strengthened 2 Nos. labs. | Reduction in the use of insecticides. To reduce environmental pollution. | Reduced use of insecticides. Less environmental pollution. |
| **Natural resource management** | | | | |
| Water storage & water conservation tanks | To bring 365 ha. CCA under irrigation and creation of 6945 cu. mtr. storage capacity | Targeted CCA under irrigation brought & storage capacity created in full. | To increase production & productivity of crops | Productivity of crops /cropping intensity increased. |
| Water storage & water conservation tanks | To bring 409.97 ha. CCA under irrigation. | Targeted CCA under irrigation brought. | To increase production & productivity of crops. | Productivity of crops /cropping intensity increased. |
| Water storage & water conservation tanks | To construct 7 community irrigation projects. | Targeted number of community irrigation projects constructed. | To increase production & productivity of crops. | Productivity of crops /cropping intensity increased. |
| Water storage & water conservation tanks | To construct 22 community irrigation projects. | Targeted number of community irrigation projects constructed. | To increase production & productivity of crops. | Productivity of crops /cropping intensity increased. |

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| Water storage & water conservation tanks | To construct 5 community irrigation projects. Covering 87 ha CCA | 5 community irrigation projects constructed covering targeted CCA | To increase production & productivity of crops. | Productivity of crops /cropping intensity increased. |
| Water storage & water conservation tanks | To construct 8 community irrigation projects. Covering 178.28 ha CCA | 8 community irrigation projects constructed covering targeted CCA | To increase production & productivity of crops. | Productivity of crops /cropping intensity increased. |
| Water storage & water conservation tanks | To construct 22 water harvesting scheme &7 community irrigation scheme. Covering 178.28 ha CCA | Targeted number of water harvesting & community irrigation projects constructed. | To increase production & productivity of crops. | Productivity of crops /cropping intensity increased. |
| Water storage & water conservation tanks | To construct 17 Nos. FIS/LIS/WHS, 10 Nos. Shallow Tube Wells, 200 Nos. shallow bore wells, 100 Nos. community Poly & Brick lined ponds and 250 Nos. Tank irrigation schemes. | Targeted number of soil and water conservation structures constructed/created. | To increase production & productivity of crops. | Productivity of crops /cropping intensity increased. Diversification to high value crops, Production of Fish Culture, Reduction in soil loss |
| Water storage & water conservation tanks | To execute 3 Nos. sub schemes viz., Shallow Wells, Shallow Bore Wells & Tank Irrigation schemes. | Targeted number of irrigation sub schemes constructed/ executed. | To increase production & productivity of crops. | Productivity of crops /cropping intensity increased. |
| Water storage & water conservation tanks | To construct 33 Nos. Flow Irrigation & 7 Nos. Water Harvesting Schemes.. | Constructed targeted number of FIS & WHS. | To increase production & productivity of crops. | Productivity of crops /cropping intensity increased. |

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| Water storage & water conservation tanks | To construct 3 sub schemes viz., water storage tanks, shallow wells & shallow bore wells. | Construction of Shallow wells, bore wells & WST was completed to irrigate 58 Ha. CCA. | To increase production & productivity of crops. | Productivity of crops /cropping intensity increased. Diversification to high value crops about 10ha. Area. |
| Water storage & water conservation tanks | To construct WHS, Minor Irrigation schemes, Shallow bore wells/ wells & water storage tanks. | Executed WHS, Minor Irrigation schemes, Shallow Bore wells/ wells &WST covering 466.38 Ha. CCA | To increase production & productivity of crops. | Productivity of crops /cropping intensity increased. Diversification to high value crops (25% area ) |
| **Organic farming/ Bio fertilizers** | | | | |
| Organic farming | To supply vermi culture to 50,000 farming families | 78,911 farming families benefited. | Production of vermi compost. Reduction in the use of synthetic / inorganic fertilisers, Improvement in the physical & biological properties of soil. | 20,000 MT vermi compost (in 4 lots) produced. Improved soil fertility, porosity, water infiltration & water holding capacity. Eco-friendly farming. |
| Training & capacity buiding | To strengthen infrastructural facilities. | Strengthened infrastructural facilities primarily at SAMETI, Mashobra. | To modernize & strengthen training / capacity building facilities. | Improved training / capacity building facilities. |
| Organic farming | To assist 90,000 farmers for vermi compost production. To bring 5,000 ha. area under organic certification. To promote bio-pesticides & bio agents. | 90,000 farmers assisted for vermi compost production through supply of vermi culture @ Rs.200/- per family. 5,000 ha area organically certified. Certified bio-pesticides / bio-agents in 4,000 ha. Promoted | Production of vermi compost. To improve biological & physical properties of soils. To increase farm income. | Produced 90,000 to 1,35,000 MT vermi compost annually (in 4 lots). Improved soil fertility, porosity, water infiltration, water holding capacity. Enhanced farm income due to reduced cost of production. |

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| Strengthening of labs | Strengthening of 2 Bio-Control Labs, 2 Soil Testing Labs and 1 SPTL. | 2 Bio-Control Labs, 2 Soil Testing Labs and 1 SPTL strengthened. | To enhance the capacity / efficiency of soil testing laboratories. To reduce the environmental pollution by promoting IPM modules. | Sample analysing capacity / efficiency of soil testing laboratories enhanced. Reduction in the environmental pollution by minimizing the use of insecticides and promoting indigenous bio control agents. |
| Organic farming | To bring 1200 ha under Certified Organic Farming. | 1200 ha under Certified Organic Farming brought. | Adoption of Sustainable organic farming practices by the farmers. Capacity building of selected farmers on different aspect of organic farming. Higher farm income. | Increased adoption of organic farming practices by the farmers. Own organic inputs prepared by the farmers at their farms. Higher farm income obtained. Eco-friendly farming. |
| Organic farming | To assist 20,000 farmers in setting up of vermi compost units. To bring 2,000 ha. area under organic certification. To promote bio-pesticides & bio agents. | 20,239 farmers set up own vermi compost production units. 1,880 ha area organically certified. Certified bio-pesticides / bio-agents in 3,397 ha. promoted. | Production of vermi compost. To improve biological & physical properties of soils. To increase farm income. | Produced 20,000 to 30,000 MT vermi compost annually (in 4 lots). Improved soil fertility, porosity, water infiltration, water holding capacity. Higher return per unit area due to reduced cost of production. |
| Organic farming | To assist 22,000 farmers in setting up of vermi compost units. To bring 2,500 ha. area under organic certification. To promote bio-pesticides & bio agents in 6,000 ha. area. | 23,167 farmers assisted to set up vermi compost units. 2467 ha area organically certified. Certified bio-pesticides / bio-agents in 4252 ha promoted | Production of vermi compost. To improve biological & physical properties of soils. To increase farm income. | Vermi compost production promoted. Improved soil fertility, porosity, water infiltration, water holding capacity. Higher return per unit area due to reduced cost of production |

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| Organic farming | Setting up of 3,000 vermi beds. | 3,029 Vermi beds setup. | To reduce the use of chemical fertilizers. To improve the physical & bio logical properties of Soils. To increase production per unit area. | Saving of chemical fertilizers. Improved soil fertility, porosity, water infiltration, water holding capacity. Higher returns per unit area due to reduced cost of production per unit area |
| **Research (Agri/Horti/Animal Husbandry etc)** | | | | |
| Strengthening of labs | Nine fertiliser/soil testing/soil survey labs to be strengthened. | Strengthened nine fertiliser/soil testing/soil survey labs | To increase the efficiency of different labs. To supply the quality fertilisers. To promote balanced fertiliser use. | Increased efficiency of different labs. Supply of quality fertilisers ensured. Balanced fertiliser use promoted. |
| Strengthening of labs | To strengthen bio-control & bio-pesticide testing lab. | Strengthened 1 No. bio-control & 1 No. bio-pesticide testing lab. | Reduction in the use of pesticides. To reduce environmental pollution. | Use of chemical pesticides reduced. Less environmental pollution. |
| **Seed** | | | | |
| Seed production of root slips | Good quality parental inbreds seed and maize hybrid seed production at university farms, seed multiplication farms of department of agriculture and farmers field. | 6546 kg and 4400kg seed of single cross of maize hybrid (F1) HQPM 1 was produced | Production of good quality single cross maize hybrid seed. | Good quality seed of single cross maize hybrid seed produced |

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| Training and capacity building | Training on single cross hybrid seed production technology to the officials of the Department of Agriculture, unemployed youth and progressive farmers | 400 kg breeder seed of parental lines of HQPM -1 was produced at CSK HPKV Research centres. | Progressive farmers of different district of the state to be trained to adopt the single cross maize hybrid seed production. | Eight one day training programme on 'single cross maize hybrid seed production technology' were organized by different cooperating centers of this project |
| Seed development | 18.5 ha seed production area to be reclaimed. Additional 1000 qtls. Foundation seed & 20,000 qtls. Certified seed to be produced. | 18.5 ha seed production area reclaimed. Additional 1000 qtls. Foundation seed & 20,000 qtls. Certified seed produced. Seed stores at 2 farms (1000 MT) constructed. New farm machinery at 2 farms installed. Irrigation system at 2 farms (37 ha) upgraded. 5 vermi compost units constructed. | By strengthening the seed farms the production of foundation & certified seed would increase by 1000 qtls. and 20000qtls. respectively. Seed Replacement rate will increase. Availability of quality certified seed of different crops to the farmers of the state at cheaper price. | Seed farm(s) strengthened and production of foundation and certified seeds increased by 1000 qtls. and 20000 qtls respectively. Quality certified seeds of different crops were made available to the farmers of the State at cheaper price. Seed replacement rate increased. |
| Training and capacity building | Training to be imparted to 1530 seed growers. | 1530 seed growers trained. | Increase in number of seed growers and more seed/area & seed production shall be achieved. Increase in area & production of wheat quality certified seed | No. of seed growers increased thereby increasing area & production of wheat quality certified seed. |

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| Seed development | Reclamation of seed prod. area 25 ha., fencing 2200 RMT, Upgradation of seed treatment facility 1 No., Upgradation of irrigation system in 1 Farm, Setting up seed processing unit 1 No., Upgradation of seed processing unit1 No. | 25 ha. seed prod. Area reclaimed. fencing 2200 RMT, Upgradation of seed treatment facility 1 No., Upgradation of irrigation system in 1 Farm. One seed processing unit setup & one upgraded. | By strengthening the seed farms, the production of foundation seed and certified seed would increase. Availability of quality certified seed of different crops to the farmers of the state at lower prices. | Increased production of foundation seed & certified seed. Quality certified seed of different crops made available to the farmers. |
| Seed development | Distribution of hybrid maize seed to the growers for enhancing the productivity. | Assistance given for enhancement of productivity in maize by distributing 10000 qtls. maize hybrid seed to the farmers. | To enhance production & productivity of maize. | Enhanced production & productivity of maize. |
| Seed development | 30,000 qtl. seed to be treated. To organize 300 demonstrations and trainings on seed treatment. To organize 24 seed treatment / publicity campaigns. | 31,634 qtl. departmental seed & 30,000 qtl. farmers own seed treated. 300 demonstrations & trainings on seed treatment. 24 seed treatment / publicity campaigns organized | To increase seed germination. To improve plant population & productivity. | Increased seed germination. Uniform seedling emergence. Improved plant population thus higher productivity |
| Seed development | 40,000 qtls. certified seed of Rabi crops to be distributed @ 50% assistance. | Distributed 40,000 qtls. certified seed of Rabi crops @ 50% assistance to the farmers of the State. | To increase production & productivity of Rabi crops. | Increased production & productivity of Rabi crops |
| Farm strengthen | 8 Nos. farms to be strengthened. | 8 Nos. seed multiplication farms strengthened. | To improve seed replacement rate. To distribute quality certified seed of different crops to the farmers. | Seed replacement rate improved. Distributed quality certified seed of different crops to the farmers. |

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| Seed development | 80,000 qtl. seed to be treated. 340 demonstration and trainings on seed treatment to be organized. 24 seed treatment campaigns to be organized. | 91790 qtl. departmental seed & farmers own seed treated. 340demonstrations & trainings on seed treatment. 24 seed treatment campaign organized | To increase seed germination. To improve plant population & productivity. | Increased seed germination. Uniform seedling emergence. Improved plant population thus higher productivity. |
| Seed development | 40,000 qtls. certified seed of Kharif crops to be distributed @ 50% assistance. | Distributed 40,000 qtls. certified seed of Kharif crops @ 50% assistance to the farmers of the State. | To increase production / productivity of Kharif crops. | Increased production / productivity of Kharif crops |
| Seed development | 95,000 qtl. seed to be treated. 380 demonstration and trainings on seed treatment to be organized. 24 seed treatment campaigns to be organized. | 91,364 qtl. departmental seed & farmers own seed treated. 380 demonstrations & trainings on seed treatment. 24 seed treatment campaign organized | To increase seed germination. To improve plant population & productivity. | Increased seed germination. Uniform seedling emergence. Improved plant population thus higher productivity. |
| Seed development | To strengthen 15 seed multiplication farms and 1 seed processing unit. | 15 seed multiplication farms and 1 seed processing unit strengthened. | By strengthening the seed farms / seed infrastructure, the production of foundation & certified seed would increase. Availability of quality certified seed of different crops to the farmers. Seed Replacement rate will increase. | The production of foundation and certified seeds increased. Quality certified seeds of different crops were made available to the farmers. Seed replacement rate increased. |

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| Seed development | To strengthen 22 Nos. seed multiplication farms | 22 Nos. seed multiplication farms strengthened | The production of foundation & certified seed would increase. Availability of quality certified seed of different crops to the farmers. Seed Replacement rate will increase. | The production of foundation and certified seeds increased. Quality certified seeds of different crops were made available to the farmers. Seed replacement rate increased. |

**Output & outcomes (Jammu & Kashmir)**

| | **Expected output** | **Actual output** | **Expected outcome** | **Actual outcome** |
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| **Animal Husbandry** | | | | |
| Genetic improvement | To purchase 1590 elite rams from progressive breeders | 1797 elite rams were purchased | To enhance the wool and mutton production and thereby enhancing the economic benefits to breeders by producing improved progeny. | Enhanced mutton and wool production. However actual benefits will accumulate in coming years. |
| Genetic improvement | To establish 98 sheep and goat units on participatory mode | 98 sheep and goat units established | To improve their socio economic status. | Improved socio economic status of sheep and goat breeders |
| Genetic improvement | To purchase 20 shearing machines | 67 shearing machines purchased | To purchase 20 shearing machines | Employment provided to 98 youths. |
| Genetic improvement | To establish 10 Mobile Polyclinics at district headquarters. | 10 Mobile Polyclinics established. | To establish 10 Mobile Polyclinics at district headquarters. | 10 Mobile Polyclinics established. |
| Genetic improvement | To enhance the fodder production in the farm by land development and fencing | Enhanced fodder production and safety of departmental lands at FDF Lam and Kalsian | To enhance the fodder production in the farm by land development and fencing | Enhanced fodder production and safety of departmental lands at FDF Lam and Kalsian. |
| Genetic improvement | To purchase 250 tents for the departmental staff going to highland pastures. | 324 tents were purchased. | To purchase 250 tents for the departmental staff going to highland pastures. | 324 tents were purchased. |

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| Taurplin sheets | To purchase 1495 tarpaulins/ poly propylene sheets for the departmental staff and migratory breeders going to highland pastures. | 1151 tarpaulins/ poly propylene sheets were purchased during the period under review. Another 1255 polypropylene sheets for migratory breeders were purchased during 2012-13 by revalidated funds. | To purchase 1495 tarpaulins/ poly propylene sheets for the departmental staff and migratory breeders going to highland pastures. | 1151 tarpaulins/ poly propylene sheets were purchased during the period under review. Another 1255 polypropylene sheets for migratory breeders were purchased during 2012-13 by revalidated funds |
| Seed minikits | To distribute 8905 improved fodder seed mini kits to sheep and goat breeders. | 10435 improved fodder seed mini kits were distributed. | To distribute 8905 improved fodder seed mini kits to sheep and goat breeders. | 10435 improved fodder seed mini kits were distributed. |
| Training & capacity buiding | To organize 50 farm darshan tours. | To acquaint the sheep and goat breeders about the latest managemental practices. | To organize 50 farm darshan tours. | Sheep and goat breeder visited the departmental farms and learnt about various scientific practices. |
| First aid kit | To purchase 12450 first aid kits. | 17155 veterinary first aid kits were purchased and distributed. | To purchase 12450 first aid kits. | 17155 veterinary first aid kits were purchased and distributed. |
| Genetic improvement | Maintainance of 100 breeding bulls | Maintainance of 100 breeding bulls | Extending breeding coverage to inaccessible areas | Cross bred conversion of bovines |
| Genetic improvement | Regular Supply to 523 AI centres | Supply maintained to 523 AI centres | Strengthening Artificial insemination facilities | 23 new centres added |
| Genetic improvement | 23 | 23 | Extending these facilities to additional areas | 23 new centres added |
| Genetic improvement | At 523 centres | Proper storage at 523 centres | Proper storage of germ plasm | Objective achieved |
| Others | Procurement of 300 casting ropes | 300 casting ropes procured | Ensuring better restrainment of animals during treatment | Ensuring better restrainment of animals during treatment |
| Others | Procurement of 500 trevis | 500 trevis procured | Ensuring better restrainment of animals during treatment | Objectives achieved |
| Others | Procurement of 150 kits | Procurement of 150 kits | Enhancing efficiency of field institutions | Enhancing efficiency of field institutions |

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| Others | Procurement of 150 kits | Procurement of 150 kits | Ensuring better healthcare to animals | Ensuring better healthcare to animals |
| Genetic improvement | 0.92 lacs castrations | 0.90 lac castrations performed | Genetic upgradation of bovines | 98% objectives achieved |
| Genetic improvement | 0.92 lacs castrations | 0.90 lac castrations performed | Avoiding introduction of undesired germ plasm | 98% objectives achieved |
| Genetic improvement | 0.92 lacs castrations | 0.90 lac castrations performed | Enhancing better output from progeny | 98% objectives achieved |
| Genetic improvement | 50% c/b conversion by 12th five year plan | 34% c/b conversion achieved | Genetic upgradation of bovines | Genetic upgradation of bovines |
| Genetic improvement | 50% c/b conversion by 12th five year plan | 34% c/b conversion achieved | Enhancing better output from progeny | Enhancing better output from progeny |
| Genetic improvement | Regular Supply to 523 AI centres | Supply maintained to 523 AI centres | Strengthening Artificial insemination facilities | 23 new centres added |
| Genetic improvement | 23 | 23 | Extending these facilities to additional areas | 23 new centres added |
| Genetic improvement | At 523 centres | Proper storage at 523 centres | Proper storage of germ plasm | Objective achieved |
| Poultry development | 1.20 lakh low input technology bird distribution | 1.20 lakh low input technology bird distribution | Enhancement in egg & poultry meat production | 100% objectives achieved |
| Tractor | 1 tractor | 1 tractor | Improving farm mechanization of departmental farms | Improving farm mechanization of departmental farms |
| Others | 300 units | 300 units | Increasing palatability and nutrition of fodder | Increasing palatability and nutrition of fodder |
| Others | 4 | 4 | Better health care facilities | Better health care facilities creaed in 4 new distt. |
| Others | 4 | 4 | Creating referral facilities for field institutions | Creating referral facilities for field institutions |
| Others | 4 | 4 | Upgrading infrastructure of diagnostic labs | Upgrading infr. of diagnostic labs in 4 new distts. |
| Others | 4 | 4 | Providing efficient diagnostic facilities | Providing efficient diagnostic facilities |
| Others | 24 | 24 | Creating mini diagnostic | Diagnostic facilities |

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| | | | facilities at blocks | created at 24 blocks |
| Others | Nil outbreak | No major outbreak in the blocks | Reduction in disease outbreaks | No. of diusease outbreaks reduced |
| Others | 64 refrigerators | 64 refrigerators procured | Maintaining quality of essential vaccines and drugs | The cold chain in the field was maintained |
| Others | Nil outbreak | No major outbreak in the blocks | Reduction in disease outbreaks | No. of diusease outbreaks reduced |
| Others | Nil disease outbreak | Nil disease outbreak | Reduction in losses due to diaseases | Reduction in losses due to diaseases |
| Others | Nil outbreak | No major outbreak in the blocks | Reduction in disease outbreaks | No. of diusease outbreaks reduced |
| Training and capacity building | Training of 500 farmers | Training of 500 farmers - | Skill upgradation and awareness of farmers | 100% objectives achieved |
| Training and capacity building | 100 cattle shows | 100 cattle shows organized 10 in each distt. | Skill upgradation and awareness of farmers | 100% objectives achieved |
| Training and capacity building | Organizing of 50 awareness camps | Organizing of 50 awareness camps | Skill upgradation and awareness of farmers | 100% objectives achieved |
| Training and capacity building | 10 cattle shows | 10 cattle shows organized | Skill upgradation and awareness of farmers | 100% objectives achieved |
| Poultry development | 1.20 lakh low input technology bird distribution | 1.20 lakh low input technology bird distribution | Enhancement in egg & poultry meat production | 100% objectives achieved |
| Poultry development | 1.20 lakh low input technology bird distribution | 1.20 lakh low input technology bird reared | Enhancement in egg & poultry meat production | 100% objectives achieved |
| Others | 0.90 lacs c/b births | 0.90 lacs c/b births | Ensuring in time diagnosis of pregnancy | Objectives achieved |
| Others | 0.90 lacs c/b births | 0.90 lacs c/b births | Ensuring detection of false pregnancies | Objectives achieved |
| Others | 0.90 lacs c/b births | 0.90 lacs c/b births | Avoiding long inter-calving periods | Objectives achieved |
| Genetic improvement | Regular Supply to 523 AI centres | Supply maintained to 523 AI centres | Strengthening Artificial insemination facilities | 23 new centres added |
| Genetic improvement | 23 | 23 | Extending these facilities to additional areas | 23 new centres added |

| | | | | |
|---|---|---|---|---|
| Genetic improvement | At 523 centres | Proper storage at 523 centres | Proper storage of germ plasm | Objective achieved |
| Genetic improvement | Procurement of 124 sperm warmers | Procurement of 124 sperm warmers | Strengthening Artificial insemination facilities, Ensuring quality of germ plasm at the time of insemination | Objectives achieved |
| Others | 248 kits procurement | 248 kits procured | Enhancing efficiency of field institutions and Ensuring better healthcare to animals | Objectives achieved |
| Poultry development | 1.20 lakh low input technology bird distribution | 1.20 lakh low input technology bird distribution | Enhancement in egg & poultry meat production | 100% objectives achieved |
| Poultry development | 1.20 lakh low input technology bird distribution | 1.20 lakh low input technology bird distribution | Enhancement in egg & poultry meat production | 100% objectives achieved |
| Poultry development | 1.20 lakh low input technology bird distribution | 1.20 lakh low input technology bird distribution | Enhancement in egg & poultry meat production | 100% objectives achieved |
| Poultry development | 1.20 lakh low input technology bird distribution | 1.20 lakh low input technology bird distribution | Enhancement in egg & poultry meat production | 100% objectives achieved |
| Poultry development | 1.20 lakh low input technology bird distribution | 1.20 lakh low input technology bird distribution | Enhancement in egg & poultry meat production | 100% objectives achieved |
| Training and capacity building | Training of 138 private paravets | Training of 138 private paravets | Upgrading technical know how of field stockman | Upgrading technical know how of field stockman |
| Genetic improvement | 3.0 lakh artificial inseminations | 3.05 lakh A.Is. | Healthy cross bred livestock | 100% objectives achieved |
| Genetic improvement | 1166 rams purcahsed | 122050 ewes tupped | 97640 superior cross bred lambs born | 97640 cuperior cross bred lambs born |
| Horizont al growth by establishment of sheep/goat units in private sector | 102 sheep & 11 Goat units established | 102 sheep and 11 goat units established | 113 employments generated 4232 lambs kids borne 2116 superior rams/bucks produced | 113 employments generated 4232 lambs kids borne 2116 superior rams/bucks produced |

| | | | | |
|---|---|---|---|---|
| Logistic support to sheep/ goat rearing community | 90 Portable shearing machines with 30 gensets | 1.21 lacs sheep sham by these shearing machines | 1.21 lacs sheep sham by these shearing machines | 1.21 lacs sheep sham by these shearing machines |
| Logistic support to sheep/ goat rearing community | 13915 seed kits distributed among farmers | 1400 kanals fresh orchid brought under horti-pastural system | 1400 kanals fresh orchid brought under horti-pastural system | 1400 kanals fresh orchid brought under horti-pastural system |
| Provision for optimal veternary healthcare | 12 moblie vans purchased | 12 moblie vans purchased | 12 mobile poly clinic established | 12 mobile poly clinic established |
| Logistic support to sheep/ goat rearing community | 459 kits distributed | 459 farmers benefited and 22900 sheep of the breede provided with enriched fodder | 459 farmers benefited and 22900 sheep of the breede provided with enriched fodder | 459 farmers benefited and 22900 sheep of the breede provided with enriched fodder |
| Provision for optimal veternary healthcare | upgradation of laboratries in 4 newly created districts and upgradation of 6 old districts | 13500 fecal samples and 4700 blood samples tested | 13500 fecal samples and 4700 blood samples tested | 13500 fecal samples and 4700 blood samples tested |
| Breed development and conservation | 4 sheep breeding farms augmented by fixing of chain link fencing | 4 sheep breeding farms augmented by fixing of chain link fencing | 4 sheep breeding farms augmented by fixing of chain link fencing | 4 sheep breeding farms augmented by fixing of chain link fencing |
| Provision for optimal veternary healthcare | 450 hoof pairing scissors 200 digital balances and 26 branding machines purchased | 450 hoof pairing scissors 200 digital balances and 26 branding machines purchased | 450 hoof pairing scissors 200 digital balances and 26 branding machines purchased | 450 hoof pairing scissors 200 digital balances and 26 branding machines purchased |
| **Extension** | | | | |
| Training and capacity building | Interaction of 120 farmers with farmers and institutions outside the state | 120 farmers taken on exposure visit to outside the state | Skill upgradation and awareness of farmers | 100% objectives achieved |
| Logistic support to sheep/ goat rearing community | 905 tarpaulins 570 solar lanterns 182 woolen blankets | 905 tarpaulins 570 solar lanterns 182 woolen blankets | 905 tarpaulins 570 solar lanterns 182 woolen blankets | 905 tarpaulins 570 solar lanterns 182 woolen blankets |
| Training and capacity building | 3 interstate exposure tours conducted | 3 interstate exposure tours conducted | 75 sheep/goat breeders taken for four | 75 sheep/goat breeders taken for four |
| **Fisheries** | | | | |
| Houses for fisher mans | 264 | 264 | 264 | 264 |
| **Horticulture** | | | | |

| | | | | |
|---|---|---|---|---|
| Genetic improvement | 1.Development of lines with Grade I quality | Lines identified with high coloring power (more than 300),high aroma (>60) and high bitterness (>120) | 1Availability of high yielding clones with high quality | NA |
| Officers/Saffron growers trained | More than 900 officers/farmers trained | Increase in productivity | Production increased from 9 .M.T to above 15 M.T with increase in Productivity from 2.5 kg/ha to 3.96 kg/ha | NA |
| Horticulture mechanization (power operated machine upto 20 BHP & above 20BHP) | 251 ha | 25 % increase in production | NA | NA |
| Mechanization (Canopy Management-Installation of Bower System) | 272 No. | 20 % increase in production | NA | NA |
| Gap filling of old orchard | 828 ha | 10 % increase in production | NA | NA |
| Establishment of Hi Tech Green Houses in departmental nurseries for production of quality planting material | 3 No | 10 % Increase in product quality budded/grafted planting material | NA | NA |
| Top working of inferior/wild fruit trees | 3702 ha | 3492 ha | 3702 ha | 3492 ha |
| Canopy management | 3718 No | 4122 No | 3718 No | 4122 No |
| Gap filling | 2818 ha | 3028 ha | 2818 ha | 3028 ha |
| Mechanization - power tiller, manual operated equipments | 1008 No | 1481 No | 1008 No | 1481 No |
| creation of water sources | 437 No | 646 No | 437 No | 646 No |
| Olive cultivation | 26.5 ha | 21.2 ha | 26.5 ha | 21.2 ha |
| Horticultural mechanization | 34 Nos | 16 Nos | 34 Nos | 16 Nos |
| Development of orchard | 35 Nos | 27 Nos | 35 Nos | 27 Nos |

| | | | | |
|---|---|---|---|---|
| /nursurie for quality productn of plant material | | | | |
| **Marketing and postharvest management** | | | | |
| On farm handling unit (better post harvest management) | 146 No | 10 % increased in production | NA | NA |
| **Micro/ Minor irrigation** | | | | |
| Water conservation technology for rainfed horticulture | 500 ha | 321.53 ha | 500 ha | 321.53 ha |
| **Organic farming/ Bio fertilizers** | | | | |
| Organic farming | 212 Nos | 109 Nos | 212 Nos | 109 Nos |
| Sericulture | | | | |
| Rearing kits | 527 Nos | 527 | 527 | 527 |
| rearing House | 267 | 260 | 267 | 260 |

**Output & outcomes (Punjab)**

| | **Expected output** | **Actual output** | **Expected outcome** | **Actual outcome** |
|---|---|---|---|---|
| **Dairy Development** | | | | |
| Training and capacity buidling (No's) | 1566(5 days training ) | 1566 | 1566 | 1566 |
| Risk Management | 38000 milch animals | 3770 beneficiary | 38000 milch animals | 3770 beneficiary |
| Shelter Management | 32140 Milch animals | 1607 beneficiary | 32140 Milch animals | 1607 beneficiary |
| Processing/storage facility | 1280 (milch animals) | 32beneficiary | 1280(milch animals) | 32 beneficiary |
| Clean & Quality Milk production | 7550(milch animals ) | 755 Beneficiary | 7550(milch animals ) | 755 Beneficiary |
| Preservation of fodder | 1750 (milch animals) | 35 Beneficiary | 1750 (milch animals) | 35 Beneficiary |
| Renewable energy resources | 7 unit | 7 Beneficiary | 7 unit | 7 |
| Human health improvement. | 9300 (milch animals ) | 532 beneficiary | 9300 (milch animals ) | 532 beneficiary |

## Output & outcomes (Uttar Pradesh)

| | Expected output | Actual output | Expected outcome | Actual outcome |
|---|---|---|---|---|
| **Animal Husbandry** | | | | |
| Breed development & strengthening of labs | 1 (semen preservation lab with filling, sealing and printing facilities) | Developed trained human resource in the field of semen preservation. Also, up gradation of the livestock of the mentioned species | One semen lab with filling sealing and printing facilities | NA |
| **Crop Development** | | | | |
| Seed drills | Purchase of 730 Seed drills | Purchased 801 ferti seed drills | Increased area 1.46 lakh ha | Enhanced the farmers knowledge and skill for sowing method and use of seed drill for line sowing |
| **Dairy Development** | | | | |
| Minidairy establishment | 11150 minidaires (2 animal units) | 10298 Mini dairies (2 animal units) | 178400 LPD Milk production | 142200 LPD Milk production |
| Minidairy establishment | 6220 minidaires ( 10 animal units) | 5266 minidaires ( 10 animal units) | 184160 LPD Milk production | 124904 LPD Milk production |
| Minidairy establishment | 3483 Mini Dairies ( 10 Animal Units) | 3115 Mini Dairies (10 Animal Units) | 104160 LPD Milk Production | 70176 LPD Milk Production |
| **Fertilizers & INM** | | | | |
| Strengthening of labs | Strengthening of 04 Pesticide Quality Control laboratory in U.P. | For improvement capacity of the Pesticide Quality Control Labs | 04 Pesticide Quality Control Lab strengthen | Improved the capacity of Pesticide Quality Control Lab |
| **Integrated Pest Management** | | | | |
| Strengthening of labs | Strengthening of 04 Pesticide Quality Control laboratory in U.P. | For improvement capacity of the Pesticide Quality Control Labs | 04 Pesticide Quality Control Lab strengthen | Improved the capacity of Pesticide Quality Control Lab |
| **Research (Agri/Horti/Animal Husbandry etc)** | | | | |
| Training & capacity buiding | Climate change awareness amongst farmers | Total 1189 farmers+ 61 Faculty, Media persons and civil society | 1189 farmers awared about Climate change issues | Total 1189 farmers+ 61 Faculty, Media persons and civil society members |

| | | | | |
|---|---|---|---|---|
| | | members | | |
| Any other | Geospatial data for DEM extraction | Digital elevation model | Digital elevation model for Students teaching material | Digital elevation model for Students teaching material |
| **Seed** | | | | |
| Strengthening of labs | Strengthening of 09 seed testing laboratory in U.P. | For improvement capacity of the seed testing labs | 09 Seed testing lab strengthened | Improved the capacity of seed testing |

## Output & outcomes (Uttarkhand)

| | | | | |
|---|---|---|---|---|
| **Animal Husbandry** | | | | |
| Dairy Development | 28 Nos | 28 Nos | 6 KL/day | 6 KL/day |
| **Horticulture** | | | | |
| Nursery | Development of planting material of rare and endangered medicinal plants like *Saussurea lappa, Aconitum heterophyllum, Allium stracheyi, Pleurospermum angelicoides, Bunium persicum* | QPM of selected species was raised in 3 new nurseries in high altitude of district Pithoragarh and in one already established nursery of HRDI at Munsyari, Distt. Pithoragarh | 4 nurseries were proposed but due to unavailability of land only 3 nurseries were established | The target of production of QPM was successfully achieved in established 3 nurseries |
| **Horticulture** | | | | |
| Market promotion | Providing facilities to growers for storage of raw produce | 01 collection center at Munsyari, Distt. Pithoraghar was established | 01 collection centers at Dharchula could not be established due to unavailability of land | NA |
| **Sericulture** | | | | |
| Cocoon Production / MT | 24-68 | 67, A & B Grade Cocoons | Rs 88.40 lac (Cocoon Cost) | Rs 87.10 lac (Cocoon Cost) |

**SOUTH REGION**

| **Output and Outcome (Tamil Nadu)** | | | | |
|---|---|---|---|---|
| **Agricultural Mechanization** | | | | |
| Machine and equipment assistance | Totally 43512 Nos.of Agricultural Machinery and Implements / Equipments were programmed to distribute to the farmers from 2007-08 to 2011-12 | Achieved | To increase the farm power availability from 1.23 kW/Ha to the required level of 2.5 kW/Ha. | Farm power availability of 1.23 kW/ha in the year 2007-08 has increased to 1.73 kW/Ha in the year 2011-12 |
| **Animal Husbandry** | | | | |
| Extension & training | Imparting Polytechnic / Skill development courses to 500-600 progressive farmers, self help group members, rural women in different farming and non-farming sectors in livestock and poultry and also to create Infrastructure facilities (house) to the livestock. 20 Dairy cattle unit , 44 sheep unit, 44 goat unit and 12 Pig unit. | 561 progressive farmers, self help group members, rural women were trained in different farming and non-farming sectors in livestock and poultry in addition to housing facilities to accommodate 20 Dairy cattle unit , 44 sheep unit, 44 goat unit and 12 Pig unit were created | 100% | 100% |
| Infrastructure | No. of Trainees | 40 Trainees | 40 Veterinarians from Dept of AH were trained | 40 Veterinarians from Dept of AH were trained |

| | | | | |
|---|---|---|---|---|
| | Strengthening of Frozen Semen Bank | Three equipment, namely Sperm Quality Analyzer, Trinocular phase contrast microscope and ICT facility were installed were created | The frozen Semen Bank could be strengthened by addition 3 equipment | Addition of 3 new equipment strengthened the Frozen Semen Bank |
| | 1. Actual yield of 521 litres /day is expected increase to 700 litres/day | 1. Gobar gas production: 160 kg LPG gas equivalent is produced per month, 2. Fodder production: 100 kg of fodder is produced per day, 3. Vermi compost production: 1 ton per two months 4. Milk Production: Milk production increased from 700 to 1000 litres per day, | . 2. At least 10% increase in total milk yield is expected to rise as input resources for milk production is readily available. 3. Milk producers tend to gain confidence in profitable dairy farming. 4. The profit / litre of milk produced will be increased as middle man involvement can be avoided through competitive procurement to be arranged at CCCC. 5. Production loss and mortality due to disease will be minimized by provision of health care. 6. Loss due to unsold surplus milk will be avoided by converting it into value added milk products. 7. Additional income generation is expected through sale of value added byproducts from cattle urine and dung. 8. Use of fertilizers and pesticides will be minimized. | NA |
| Animal Health | 1. Provision of 8 Mobile Disease diagnostic labs, 2. 19 walk in coolers, 3.To provide 22 Mobile veterinary units | 1. 8 Mobile Disease diagnostic labs, 2. 19 walk in coolers, 3. 22 Mobile veterinary units were provided | NA | NA |

| | | | | |
|---|---|---|---|---|
| Feed and fodder | 1. 54,600,00 slips will be distribute to in 10.5 acres, 2.To establish 440 units of Azolla plots | 43,680,00 slips distributed in 10.5 acres, established 573 azolla plots | Model I farmers produce 45 tonnes of Cumbu Napier grass and 7 tonnes of Desmanthus fodder, which would be harvested to feed their animals. The excess fodder in this model was sold to the nearby needy farmers. | Model I farmers produce 40 tonnes of Cumbu Napier grass and 6 tonnes of Desmanthus fodder, which was harvested to feed his animals. The excess fodder in this model was sold to the nearby needy farmers. The farmers were able to sell Co 4 for Rs.2/kg, 1000 Co 4 slips for Rs.300/- and Desmanthus seed for Rs.500/-. |
| **Crop Development** | | | | |
| Oilseeds and pulses | 36 demos, 30 trainings | 37 demos, 40 trainings | Improved productivity of 20-30% | 1. 30% increase in yield was recorded in the demonstration plots, 40 tons of seeds produced under this project were made available to the farmers for further multiplication, 2. 2165 farmers got trained |
| **Dairy Development** | | | | |
| Others (dairy development) | 1. Imparting Training to 720 women on Clean milk production and value addition of milk, 2.To establish of a dairy plant with a processing capacity of 300 lit/hr | 1. 720 dairy farmers have been trained on dairy farming, clean milk production, milk products preparation, marketing of the products 2. A dairy plant has been established with all the processing facilities | 100% | 100% |

| | | | | |
|---|---|---|---|---|
| **Fisheries** | | | | |
| Infrastructure/ponds of fisheries/dept/agency | 1000000 Nos. AFL | 997550 Nos. | 450.00 tonnes | 450 |
| **Information technology** | | | | |
| Development of IT Faciltites | To setup e-connectivity in all the 60 centres of TNAU (14 KVKs+ ATIC-2+ 34 Research Station+10 Colleges) will all the 385 blocks and 30 districts of Tamil Nadu | e-connectivity established in all the 60 centres of TNAU (14 KVKs+ ATIC-2+ 34 Research Station+10 Colleges) will all the 385 blocks and 30 districts of Tamil Nadu | To setup e-connectivity in all the 60 centres of TNAU (14 KVKs+ ATIC-2+ 34 Research Station+10 Colleges) will all the 385 blocks and 30 districts of Tamil Nadu | e-connectivity established in all the 60 centres of TNAU (14 KVKs+ ATIC-2+ 34 Research Station+10 Colleges) will all the 385 blocks and 30 districts of Tamil Nadu |
| **Integrated pest management** | | | | |
| Promotion of IPM | 56 locations No. of Parasitoids released in farmers field: 62,52,200. (No. of farmers: 52,201) | Nil. No. of Parasitoids released in farmers field: 62,52,200. (No. of farmers: 52,201) | Mealybug will be controlled effectively without affecting the environment. Indiscriminate use of insecticed will be avoided | NA |
| **Marketing and post harvest management** | | | | |
| Setting up/Strengthening of market infrastructure | 5000 MT Vegetables Transaction /Year, 15 shops | 5000 MT Vegetables Transaction /Year, 15 shops | 75000 consumers benefited/Year | 75000 consumers benefited/Year, 15 shops |

| | | | | |
|---|---|---|---|---|
| Setting up/Strengthening of market infrastructure | Improved Agricultural produce-80, 60 CGs/Year, 50MT/month, More weighing capacity, RBH 1 nos | Improved Agricultural produce, 50 CGs/Year, 37.5 MT/month, weigh more agriculture commodities, RBH 1 nos | Developing business model, 35MT Transaction/Year, 35MT Transaction/Year, The using the automatic weighing machine it is able to weigh more agriculture commodities, 400.00 MT | Farmers turning into Business people, 35MT Transaction/Year, 376.82 |
| **Micro/minor irrigation** | | | | |
| Percolation tanks/minor irrigation tanks | 101.40 MT | 101.40MT | Rs. 1064803 | Rs. 1064803 |
| Research (Agri/Horti/AH.etc) | | | | |
| Agri research project | NA | NA | NA | NA |
| Agri research project | resource inventory of 139 farms will be assesed | Achieved | nutrient sattus of Five agroclimatic zones will be assesed | Achieved |
| **Seed** | | | | |
| Seed distribution | 21 | 21 | 21 | 21 |
| Seed distribution | 19 | 19 | 19 | 19 |

| | | | | |
|---|---|---|---|---|
| seed testing lab | Establishment and Strengthening the existing Seed Testing Laboratories and the Grow Out Test Farm, where genetic purity tests for crop varieties are conducted. The total capacity of Seed testing facilities under the seed testing wing has improved to 1,20,000 numbers of seed samples from 60,000 seed samples capacity during the year 2007-08. | NA | NA | NA |
| **Agricultural Mechanization** | | | | |
| Machines & equipment assistance | 10 Nos New small scale equipments development, 1 work shop estabilished and 25 equipments were planing to procure. | 14 Nos New equipments developed and 20 work shop machinaries procured | Rs./hactare Decrease in labour cost | Rs./hactare Decrease in labour cost |
| Others (Agri mechanization) | 6 Nos. of implements were received for testing. | 6 Nos. of implements soil engaging parts are sent for hardness and chemical analysis. | From the basis for standard specification to be used by manufactures. | 6 Nos. of draft report sent to applicant for offering comments |
| **Animal husbandry** | | | | |

| | | | | |
|---|---|---|---|---|
| Poultry | 1.Training to 300 farmers on Modern profitable Poultry Farming 2. Produce and supply of 15000 giriraja day old birds to farmers 3. Establishment of 99 retail poultry dressing units 4. Establishment of 83 layer units 5. Establishment of 205 broiler units | 1.Trained 296 farmers on Modern profitable Poultry Farming 2. Produced and supplied of 29000 giriraja day old birds to farmers 3. Established of 99 retail poultry dressing units 4. Established of 83 layer units 5. Established of 205 broiler units | 1.Training to 300 farmers on Modern profitable Poultry Farming 2. Produce and supply of 15000 giriraja day old birds to farmers 3. Establishment of 99 retail poultry dressing units 4. Establishment of 83 layer units 5. Establishment of 205 broiler units | 1.Trained 296 farmers on Modern profitable Poultry Farming 2. Produced and supplied of 29000 giriraja day old birds to farmers 3. Established of 99 retail poultry dressing units 4. Established of 83 layer units 5. Established of 205 broiler units |
| Breed Improvement | AIS-3.5 million doses/year | 3.5 million doses/year | NA | NA |
| | 1724 Urea treat-ment plots | NA | NA | 1724 Urea treat-ment plots |
| Animal health | 1. Construction of 8 buildings of 30" x 50" size for pig rearing in all the 4 centers 2. lab should be strengthened for pig diseases investigation and also for research and development in bangalore center, 3.Training of 500 beneficiaries per center and a toal of 200 beneficiaries in all the centers, 4. 500 piglets of elite yorkshire breed to be produced per center per year and to be distributed at reduced price to the farmers | 1. A total of 664 beneficiaries were trained in scientific pig production in all the 4 centers because of delay in infrastructure development in Hassan, Shimoga and Konehalli the target could not be achieved within the time and training of beneficiaries ha been continued, 2.In bangalore center alone 750 piglets were produced and distributed to farmers at reduced price and also in other regional centers piglets were produced and distributed to the farmers | 1. Starting of pig production activities in all the 4 regional centers of KVAFSU 2. SC/ST and tribal people should be motivated to take pig production to improve their social status 3. training of pig producers in scientific pig production 4.Distribution of 500 piglets/per center/per year to the farmers at reduced price | Achieved |
| **Crop Development** | | | | |

| | | | | |
|---|---|---|---|---|
| Others | Totally around 20,000 ha area was to be brought under IFS demonstrations in seven districts. | Totally 127 villages are selected for IFS demonstrations in seven districts. The area covered is 18,333 ha and number of demonstrations are 19,221. | Overall growth in agriculture is expected to increase from 1.5-2.5 % | Mineral mixtures were provided for the cattle and it helped for milk yield increased by 1-2 l/cow/day on sustainable basis. |
| **Dairy Development** | | | | |
| Breed Improvement | Establishment to increase processing plant 202000 kg/day | Established the processinng plant to 205000 kg/day | NA | NA |
| **Fisheries** | | | | |
| Others | To conduct adequate number of surveys in Western Ghat streams and rivers | Survey conducted at 94 target places with 32 riverine stretches of the Western Ghats | Collection of 20-25 indigenous ornamental fish broodstock for seed development | Acclimatized 22 fishes from riverine to pond conditions for seed development |
| | Training to 100 farmers | 8-10 general trainings | Training to 100 farmers | 8-10 general trainings |
| | 12 fishes | 16 fishes | 12 fishes | 16 fishes |
| | 5 equipments | 5 equipments | 5 equipments | 5 equipments |
| | 3 fish feeds | 5 fish feeds | 3 fish feeds | 5 fish feeds |
| | 8 plants | 8 plants | 8 plants | 8 plants |
| | 1 | 1 | 1 | 1 |
| | 27 | 27 | 27 | 27 |

| | | | | |
|---|---|---|---|---|
| Infrastructure | Fish ponds, Hatchery, Packing shed, training hall, hostel, roads, water and power supply, generator, etc. | Fish ponds, Hatchery, Packing shed, training hall, hostel, roads, water and power supply, generator, etc. | Fish ponds, Hatchery, Packing shed, training hall, hostel, roads, water and power supply, generator, etc. | Fish ponds, Hatchery, Packing shed, training hall, hostel, roads, water and power supply, generator, etc. |
| **Horticulture** | | | | |
| Vegetable | NA | 2 kg breeder's seed and 29,250 papaya seedlings | NA | A total of 29 farmers have taken up high yielding gynodioecious papaya variety and the total production would be about 23,20,000 tons |
| Floriculture | Creation of infrastructure ( flower seed unit) for multiplication of flower crop varieties | Construction of grading, packging, quality testing unit and display and sales unit | Helps in multiplication of flower crop varieties. Increase in Breeder Seed Production of IIHR developed improved varieties of flower crops and distribution to farmers | A total of 3.25 lakh planting material of Carnation, crossandra, chrysanthemum, gladiolus, rose and tuberose and 9 kg of IIHR developed varieties of China aster were produced |
| Others | IQF Freezer-1, Dicer-1, Fruit washer-1, Freezer-1, Blancer-1, Elevator-1, Chiller-1, Etc. | IQF Freezer-1, Dicer-1, Fruit washer-1, Freezer-1, Blancer-1, Elevator-1, Chiller-1, Etc. | Exports of processed (IQF) fruit & vegetables during 2008-09-50 Mts valued at Rs 0.24 Crore, 2009-10-820 Mts valued at Rs. 4.15 Crore, 2010-11-415 Mts. Valued at Rs. 2.3 crore, 2011-12- 1560 Mts Valued at Rs. 8.50 crore | Exported processed (IQF) fruit and vegetables during 2008-09-23 Mts valued at Rs 0.11 cr, 2009-10-408 Mts valued at Rs. 2.06 cr, 2010-11-205.31 Mts valued at Rs. 1.14cr, 2011-12-937.68 MTs valued at Rs. 4.97 cr |
| Vegetable | 18278 hectare | 18278 hectare | 18278 hectare | 18278 hectare |

| | | | | |
|---|---|---|---|---|
| Fruits | procurement of equipments (21 nos), Quality testing laboratory (1 No.). Sorting & Grading unit (1 No.). Scientists room (1 No.). Conference Hall (1 No.) | Quality testing laboratory (1 No.) Sorting & Grading unit (1 No.). Scientists room (1 No.). Conference Hall (1 No.) | Procurement of equipment, Quality testing laboratory (1 No.). Sorting & Grading unit (1 No.). Scientists room (1 No.). Conference Hall (1 No.) | Quality testing laboratory (1 No.). Sorting & Grading unit (1 No.). Scientists room (1 No.). Conference Hall (1 No.) |
| **Information technology** | | | | |
| Development of IT facilities | Installation & commissioning of 634 TRG at Grampanchayath level and 140 TWS at Hobli level in Karnataka State | Installation & commissioning of TRG & TWS completed. the Rainfall and weather data are being received from all the stations. | The rainfall and weather data to be used for developing Hobli level weather forecast.The rainfall and weather data used for issuing weather related advisories to farmers through 24x7 Help-Desk. | The weather data is being used for generating meso-scale hobli level weather forecast twice a day for Karnataka state. The weather forecast and related advisories has been given to farmers / general public through 24x7 Help-Desk. The weather information and forecast has been given successfully for 8,435 callers in the first year and the number of callers are increased to 64,101 and 2,39,441 in the subsequent years. |
| **Innovative programmes** | | | | |

| | | | | |
|---|---|---|---|---|
| Others | Bhadra Command: In Davanagere district, 136 acres of problematic lands will be reclaimed to benefit 72 farmers. Crop yields are expected to increase by 10-15% over a year. Cauvery Command: In Mandya district, 100 acres of problematic lands will be reclaimed to benefit 60 farmers | Bhadra Command: Installation of subsurface drains was completed in 136 acres of Bhadra Command (Tyavangi village, Channagiri taluk, Davanagere district), 70 tons of gypsum was distributed to 16 farmers covering 50.29 acres of alkali soils. Cauvery Command: Installation of subsurface drains at 43.75 acres of 'D' and 'B' block at V. C. Farm, Mandya was completed. | Crop yields are expected to increase by 10-15% over a year | NA |
| **Marketing and post harvest management** | | | | |
| Others | Participation of Investors, Signing of MOUs | 72 MoUs worth of RS.110770 cr signed, 1900 delegates & 20 states participated including Netherland, Isreal, Australia, France. 300 organization, 110 online registration | 68 MoUs signed worth of Rs 61000 cr | 36 Projects worth Rs.11271 cr submitted to Karnataka Udyog Mitra. 29 Projects worth of Rs 10990 cr cleared by KUM & 3 projects have already been commissioned |
| Cold storage and cold chain | 6500 Mts of storage capacity | Project being implemented | To provide safe storage to agriculture/horticulture produces produced in and around to store their produce and in turn help farmers realize better rice to their produce in the market | Project being implemented |
| Godowns and warehouse | 36500 | 36500 | 36500 | 36500 |

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| Setting up/strengthening of market infrastructure | pack house-1, pre cooling units-2, cold storage for exports-4, cold storage for bulk storage-3 | pack house-1, pre cooling units-2, cold storage for exports-4, cold storage for bulk storage-3 | 2009-10-50 Mts. Horti produce exports | 2009-10-31.923 Mts. Pomegranates exported |
| **Natural Resource Management** | | | | |
| Land reclamation | Reclamation of water logged and salt- affected soils at a) B-Malla village, Taluk: Surpur, District Yadgir ( UKP command area), b) Mallapur Village, Taluk Sindhanur, District Raichur (TBP command area). | Laying of subsurface drainage Work completed in both sites and monitoring of indicators of improvement in land conditions is under progress | Increase in crop yield from 15-25q/acre to about 50-70q/acre | Monitoring is under progress and results awaited |
| **Non Farm Acitivities** | | | | |
| Other-NFA | 6 | 6 | Purchase of reference standards internal standards glasswares, chemicals, Civil works and renovation, purchase of GCMS/MS instruments | Purchase of reference standards internal standards glasswares, chemicals, Civil works and renovation, purchase of GCMS/MS instruments |
| **Research (Agri/Horti/AH.etc)** | | | | |

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| Agri research project | 1. Establishment of Labroatory (1 No),Training hall (1No), 2. 8 No's 20 ton capacity onion storage structure, 3. Three No's 5 ton capacity onion storage structure 4. Establishment of pilot scale onion dehydration unit, 5. Seven No's curing shed | 1. Establised Labroatory (1 No),Training hall (1No), 2. Established 8 No's 20 ton capacity onion storage structure, 3. Established three No's 5 ton capacity onion storage structure 4. Established of pilot scale onion dehydration unit, 5. Seven No's curing shed is established | 1. Establisment Labroatory (1 No),Training hall (1No), 2. Establishment 8 No's 20 ton capacity onion storage structure, 3. Establishment three No's 5 ton capacity onion storage structure 4. Establishment of pilot scale onion dehydration unit, 5. Establishment Seven No's curing shed is | 1. Establised Labroatory (1 No),Training hall (1No), 2. Established 8 No's 20 ton capacity onion storage structure, 3. Established three No's 5 ton capacity onion storage structure 4. Established of pilot scale onion dehydration unit, 5. Seven No's curing shed is established |
| | Planned to promote IFS to 21000 ha and targetted to produce 700 quintals of pigeopnpea | 1. Trained about 14170 farmers on ICM, 2. Covered IFS with an area of 17925.1 ha 3. Produced 728 qunitals of piogenpea | 1. Popularization of IFS demonstrations in 21000 ha 2. Pigeonpea rea expansion to 5600 ha | 1. Trained about 14170 farmers on ICM, 2. Covered IFS with an area of 17935.1 ha 3. Expanded pigeonpea area of 5824 ha |
| Agri research project | 1. Six training and capacity buiding 2. Strengthening of laboratories two no's 3. Precision farming area expansion to more than 120 ha | 1. Six training and capacity buiding conducted 2. Strengthening of laboratories one no's 3. Precision farming area has been expanded to 143.2 ha | 1. Six training and capacity buiding 2. Strengthening of laboratories two no's 3. Precision farming area expansion to more than 120 ha | 1. Six training and capacity buiding conducted 2. Strengthening of laboratories one no's 3. Precision farming area has been expanded to 143.2 ha |
| Agri research project | 900 trainings, 915 water management and nala bund cleanings | 630 trainings conducted, 886 water management and nala bund cleaned | 900 trainings, 915 water management and nala bund cleanings | 630 trainings conducted, 886 water management and nala bund cleaned |
| Agri research/teaching facility | 5 | 5 | 1 | 1 |

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| (infrastructure) | | | | |
| Agri research/teaching facility (infrastructure) | Analysis of liquid manures for their chemical composition | 3 | 3 | NA |
| Agri research/teaching facility (infrastructure) | Different crops, cropping systems of the region | Different crops, cropping systems of the region | Soil physical and chemical properties 12 crops | NA |
| Agri research/teaching facility (infrastructure) | Seven | Six | 7 | 6 |
| Agri research/teaching facility (infrastructure) | 5, 2, 50 | 5, 2, 50 | 5, 2, 20 | 5, 2, 50 |
| Agri research/teaching facility (infrastructure) | 20 No.s, 40 No.s, 10 No.s, 10 No.s, 10 No.s, 10 No.s, 5 No.s, 10 No.s, 5 No.s | 25 No.s, 50 No.s, 15 No.s, 12No.s, 8 No.s, 15 No.s, 12 No.s, 15 No.s, 15 No.s, 5 No.s | 25 No.s, 50 No.s, 15 No.s, 12No.s, 8 No.s, 15 No.s, 12 No.s, 15 No.s, 15 No.s, 5 No.s | 25 No.s, 50 No.s, 15 No.s, 12No.s, 8 No.s, 15 No.s, 12 No.s, 15 No.s, 15 No.s, 5 No.s |
| Agricultural research project | 1. To provide early warning and advisory services for management of important diseases, insect pests and weeds for 1000 ha in six districts. 2. Expected to give | 1. The survey work was undertaken in Kharif/Rabi seasons covering 825 ha from 352 villages. 2. Advisories were given totally to 1248 farmers in 528 villages for six districts | 1. Expected to increase in productivity/production of 3-4 per cent in 3 crops. 2. Expected to increase in productivity/production of 4-5 per cent in six crops. | 1. Increased crop production to the extent of 4-5 per cent as evidenced by sample plot information. Sugarcane before 80-90 t/ha after 100-110 t/ha increase in 23 per cent, Cotton before 8-10 q/ha after 12-15q/ha increase in 33 per cent, Chickpea before 9-10 t/ha after |

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| | advisories to around 500 farm families in each district | | | 11-13 t/ha increase in 21 per cent . |
| Agri research project | The technology should be reached to 8-10 thousand farmers By distributing about 500 quintals of Hebbal Avare-4 (HA-4) seeds to grow in the Southern Karnataka | About 49 quintals of seeds of HA-4 variety of field bean and plant protection chemicals are distributed to farmers | Farmers in a five years of implementation should implement the technology to the extend of 90-95%. Say about 6000-8000 farmers should be benefitted by the project and aim at higher profit | Farmers made good profit to the tune of Rs. 25000/- to 30000/- per acre (average of Rs. 27500/ farmer/acre) by cultivating Hebbal Avare-4 variety of Field bean under rain fed conditions. |

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| Agri research project | NA | NA | Demonstrations were to be conducted on 150 acres to convince the farmers on varieties and agronomic practices for higher yield and quality of jaggery.Food grade stainless steel (SS 304) for fabricating the jaggery processing equipments including the tank, pump, pans etc. Equipments for jaggery preparation were expected to yield 3 quintals of jaggery per batch of boiling.Bagasse conveyor belt was expected to convey bagasse to the drying yard.Hydraulic system was expected to perform the tipping and tilting mechanism to dispense the jaggery syrup to the cooling pit from the jaggery boiling pan.Awareness was to be created among the jaggery production farmers on the ill effects of chemicals used in jaggery preparation.jaggery production farmers were to be trained on preparation of chemical free jaggery preparation. | Demonstrations were conducted on an area of 120 acres in Mandya district on improved sugarcane varieties (Co 92005 and VCF 0517) identified to be suitable jaggery preparation. These farmers were enlightened on nutrient management, specifically nitrogen management and adverse effect of excess and late application on jaggery quality. They were convinced of the importance of integrated nutrient management. The jaggery processing equipment like crusher rollers, juice collection tank, pump, pipes, over head juice collection tank, pre heating and main boiling pans are all made of food grade stainless steel 304 grade. One motorized bagasse conveyor belt is provided to convey bagasse to the bagasse drying yard. |
| Agri research project, soil health cards and soil testing | 2954 | 2855 | 1. Finalization of nutrients recommendation for important crops (Revalidation of POP recommendation). 2. Revalidation of soil fertility ratings. Among other crops, the revalidation of NPK on soil test basis with ± 25% (based on nutrient status) was useful in increasing the grain yields of pigeonpea, sunflower and bengalgram respectively by 32.52, 29.29 and 43.70 %. Whereas yields of paddy and ragi were more by 11.78 and 25.32% respectively, due to addition of | 1) For paddy, maize, wheat, bengalgram, seed cotton and potato, the STCR approach/application of NPK based on soil test basis with NK ± 50% and P ± 25% is need to be recommended in place of POP. 2)The revalidation of NPK on soil test basis with ± 25% (based on nutrient status) was useful in groundnut, pigeonpea and sunflower. 3) Soil test based NPK recommendations + 75% RDP if soil test for P is medium or 50% |

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| | | | 25% more N, P & K when the soils were medium in NPK status. Groundnut yield was increased by 17.96% on correcting for P to the extent of ± 25% and NK by ± 50% indicating the utilization of soil P by the crop. The results that the existing LMH approach for recommending fertilizer was deficient in meeting the realistic demand of nutrient by the crop (Table 15). As a result of revalidation of existing fertilizer recommendation, it is possible to increase the productivity of paddy, maize and ragi respectively by 1885, 4110 and 1286 kg/ha. | RDP if soil test for P is high or RDP if soil test for P is Low+ Rec. PSB is recommended for chilli. 4) Soil test based NPK recommendation (LMH approach) was ideal for finger millet crop instead of POP. 5) For Soybean, POP is need to be replaced by soil test based NPK with P to the extent of ± 25% and NK by ± 50% indicating the utilization of soil P by the crop. |
| Agri Research project | 120 hectare | 64 hectares | Precision input use. Sharing of knowledge and technology on mutual benefit. Empowerment of rural youth through precision agriculture tools. | Reduction of excess usage of inputs by 15-20% and yield increase by 20-25% in Maize and Groundnut. In sugarcane saving of 50% water and 25% fertilizer was achieved with 49% higher cane yield due to precision water and nutrient management practices. Awareness was created among line departments and rural youth about the Precision farming technology. |

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| Agri Research / Teaching Facility (Infrastructure) | About 55000kg high quality cocoons will be produced by the cluster farmers every year. Amounts to 20 per cent increase in yield. About 150 ton of quality compost will be produced using sericultural wastes. About 7500kg higher quality raw silk will be produced and the same will be converted to quality fabrics | About 15000kg high quality Bivoltine cocoons have been produced by cluster farmers against their previous production of 11000kg which amounts to 25% increase in yields & more price. About 150tons of compost has been produced using sericulture farm wastes. The process of installing equipment has been completed and the production to be initiated | The cluster farmers will derive more returns per unit area from the sericulture enterprise | About Rs.90000 increased income / acre/ year has been realized by the cluster farmers |
| Agri Research Project | To develop technology for stabilization of mince from pelagic fishes | Mince from sardine fish was stabilized by use of 4% trehalose | 1. Better utilization of sardine resources 2. Heat processed fishery products with nisin can be distributed to long distance destinations. 3. Effective utilization of anchovies and other pelagic fishes for salting and drying. 4. Use of recovered proteins for animal feed. 5.Continuous production of products from the technology developed. | 1. Sardine mince was stabilized by use of trehalose in frozen form for 5-6 months 2. Fish sausages from fresh water fishes like mrigal were prepared with shelf life of 30 days at refrigerated temperature. 3. Salted, dried and spiced anchovies were prepared of acceptable quality. 4. The developed process for recovery was not adequate to get the substantial yield. 5. Fish sausages were marketed and freshwater fishes can be used for the same. |
| **Seed** | | | | |
| Seed | 7032 quintals of certified | 6761.7quintals of seed | Rs.103.78 lakhs was earned | Revenue of Rs.64.97 lakhs was |

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| Certification | seed to be sold | sold | | earned |
| **Sericulture** | | | | |
| Others | Assistance for area expansion to 400 acre | Expanded 152 acre of mulbery plantaion | Assistance to expansion of mulbery area of 8000 acres | Increased mulbery area to 3040 acres |
| **Output and Outcome (Kerala)** | | | | |
| **Animal Husbandry** | | | | |
| Breed Improvement | 1. Production of 1.5 lakh milk and 300 calves annually through modern bull farm, 2. Larger litter size (No.), and high market body weight (%) of goats | Litter size of 1.47 in control and 2.12 in AI. Weight gain of 51.2 % over control | 1. Establishment of modren bull mother farm and open nucleus breeding system at Kolahalamedu at Idukki district, 2. Higher income generation by farmers. | 1. Hi tech bull mother farm will be commissioned soon. Rkvy componets completed, 2.73.2% income for farmers because of increase in litter size and better weight gain. |
| **Crop Development** | | | | |
| Paddy | 1. Conservation and cataloguing of germplasm, 2. To popularize specialty rice in Onattukara, 3. Identification of suitable rice varieties for upland cultivation | 1. 32 acessions of germplasm, 2. 75 per cent achieved, 3.Identified rice varieties for upland in Onattukara | 1. Collection of germplasm, conservation and cataloguing, 2.Identification and popularization of speciality rice, 3.Evaluation and identification of rice varieties for upland situation | 1. Collected 32 germplasm, 2. Medicinal rice Njavara and scented rice Pusa B as ….. can be successfully cultivated in Onattukara, 3. Identified Bhagya rice variety for upland cultivation in Onattukara |
| **Horticulture** | | | | |
| Vegetable | Genetic purification of 56 vegetable varieties released by KAU | Completed genetic purification of 56 vegetable varieties released by KAU in the identified eight centers of | To bring down the variability and off types in vegetable varieties below 5% and ensure uniformity in yield, quality and disease resistance there by boosting | Produced, 234.509 kg breeder seed and 2461.397 kg of TLS seed in 55 varieties of vegetables. Reduced off types to below 5 % in all the varieties. |

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| | | KAU. | vegetable production . | |
| Vegetable | Laying out large scale demonstration for refinement and popularization of precision farming in vegetables for achieving high yield | Demonstration plots are being laid out in 3 locations in Palakkad Districts. | Boosting vegetable production through popularization of precision farming technique | Demonstration units are now laid out to popularize the implementation of precision farming technique in vegetable crops |
| Vegetable | Popularization of cultivation of cool season vegetable in Kerala through identification of varieties and laying out of demonstration plots | Demonstration plots with improved and adaptable varieties in cabbage, cauliflower, carrot, capsicum etc were laid out in the farmer's fields at different locations in the State. The newly bred varieties and hybrids by public sector organisation and private seed companies were tested in two KAU research station namely, ARS Mannuthy and Dept of Olericulture. | Boosting the production of coolseason vegetable in Kerala through varietal identification and establishing demonstration units | 32 varieties of Cabbage, 27 varieties of cauliflower, 7 varieties of carrot, 6 varieties of radish and 3 varieties of Broccoli and lettuce and 2 varieties each of Palak and Beetroot are being tested for suitability for cultivating in the plains of Kerala. Demonstration of cool season vegetables. Field demonstrations have been laid out in farmer's fields in Wynad, Calicut and Kottayam districts on 3 varieties each of cabbage and cauliflower |
| Coconut | Reduction in the incidence of pests and diseases in coconut. 2. Improvement in health of palms. 3.Enhancement in production,. | 76% increase in yield, Purchased equipments worth Rs.2.5 lakhs,10 lakhs | 1. Strengthening of the infrastructure facilities of the station, 2. Improvement in health of palms | 1. Strengthened the infrastructure facilities of ORARS, Kayamkulam. 2. Reduction in pests and diseases of coconut in the project area, 3. Improvement in the health of palms through INM |

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| Nurseries and green house | Augmenting the production and distribution of good quality seeds and planting materials at FSRS, Sadanandapuram | Construction of seed drying yard, Renovation of the existing green houses, Strengthening nursery, Assured supply of good quality seeds and planting materials to the farmers of the locality could be ensured through the implementation of the project. | Assured supply of good quality seeds and planting materials to the farmers of the locality could be ensured through the implementation of the project | With the construction of seed drying yard the drying of the seeds was carried out effectively and loss due to over drying and other ill effects are overridden. Besides by the purchase of planting materials for nursery , nursery and planting material production could be enhanced. |
| **Information Technology** | | | | |
| Development of IT facilities | NA | Contents were prepared for the website and courses. Several calculators were prepared to make farm calculations easy which is being effectively used by the experts in the Kissan Call Centre.Conducted trainings for various stakeholders | NA | Designed and developed bi-lingual (English and Malayalam) Agri- Infotech web portal (www.celkau.in). There are about 12,500 pages in the site. This is the first of its kind (equally in English and local language) in the country. Within just 14 months of launching, 2,20,000 users all over the world have used it. All the 1000 Agril. Development Units of Kerala are using the portal. About 50,000 regular farmer users and 2200 Agri. Extension workers and |

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| **Integrated Pest Management** | | | | |
| IPM Labs | 1.Construction of a building for biocontrol lab 2. setting of a lab with different equipment and othe r facilities production | Constructed a building for biocontrol lab having an area of 2000 sq.ft. 2. set up a lab with equipment and othe r f acilities for production of fungi based biopesticides, created facilities for research on entomopathogens and also for imparting training on bopesticides | The constructio of building and to create facilities for mass production and adoption of biopesticides and to reduce the use of synnthetic pesticides. | NA |
| **Agricultural Mechanization** | | | | |
| Machines and equipment assistance | 1 well, 4 pump set, 9 sprayers, 2 climbing device, 1 poly house, 1 wheel cutter | 1 well, 4 pump set, 9 sprayers, 2 climbing device, 1 poly house, 1 wheel cutter | 1 well, 4 pump set, 9 sprayers, 2 climbing device, 1 poly house, 1 wheel cutter | 1 well, 4 pump set, 9 sprayers, 2 climbing device, 1 poly house, 1 wheel cutter |
| **organic farming/bio fertilizer** | | | | |
| Promotion of organic farming | 1. Establishment of one organic centre<br>2. Large scale production of vermicompost<br>3. Organic production of seeds of paddy, sesame, vegetables and pulses<br>4. Training ` | 1. Constructed a soil analysis lab worth Rs.8.5 lakhs 2. Constructed 6 vermicompost units for the large scale production of vermicompost 3. Produced seeds of paddy, sesme, vegetables and pulses 4. Training was imparted to 10 unemployed women for 3 days 4.Formed one SHG. 5. Established two certified model organic farms in the campus for training and demonstration purposes in the field of organic farming and | 1. Large scale production of vermicompost 2. Organic production of seeds of paddy, sesame, vegetables 3. Development of organic package for rice, sesame, and vegetables 4.Training and formation of SHG | 1.Constructed a soil analysis laboratory 2.Large scale production of vermicompost 3.Produced seeds of paddy, sesame, pulses and vegetables organically 4.Training to 10 unemployed women and formed one SHG. 5.The centre acts as knowledge and learning centre for all aspects of organic Agriculture and Agri business with a mission to build competence for organizations and individuals in organic agriculture and agri business and thereby contribute to |

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| | | established and maintained various organic manure production units like vermicompost unit, azolla unit, coir pith compost unit, enriched manure production unit, biogas plant etc. | | ecologically, economically and socially sustainable agriculture & livelihood system. |
| **Research (Agri/Horti/AH.etc)** | | | | |
| Agri research project | Enhancement of facilities of jaggery unit | The unit is a model for hygienic jaggery production | Can be used for imparting training to farmers & labourers | It is being used as a demonstration unit and for imparting training for quality jaggery production, |
| | 1.Increased production, 2.Reduction in the incidence of pests and diseases, 3.Purchase of weighing machine, farm implements and tractor tyres | 1.Yield increase to the tune of 74 and 75% respectively atThazhakkara and Kandalloor, 2. Purchase of implements worth Rs.1.13963 | 1.Improvement in health status of palms, 2.Reduction of pests and diseases, 3. Increases yield through integrated nutrient management and integrated pest and diseases management, 4. Strengthening of Infrastructural Facilities of ORARS, Kayamkulam | 1.Strengthened infrastructural facilities of ORARS, Kayamkulam 2.Created awareness among farmers 3. Conducted pretreatment survey 4.Reduction in the Incidence of pests and diseases 5. Improvement in health of the palms 6.Increased yield |
| Agri research project | 1. 1200 farmers of Thazhakkara panchayath were expected to be benefited by becoming aware of IPM technology, 2.The farmers of Onattukara | 1. 1200 farmers of Thazhakkara panchayath were benefited by adopting IPM strateriges in paddy and could get a pesticide five economic crop with marginal B:C ratio | 1. Maximisation of production of paddy through IPM in Puncha fields of Onattukaraand made aware to farmers of the need for following IPM | 1. Conducted IPM demonstrations in selected puncha fields of Thazhakkara Panchayath in 200 ha . The pests and diseases in IPM plot was very low grain yield increased to |

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| | were expected to get benefitted from the biocontrol agents produced in biocontrol lab | of 5.8 to 5.9, 2. By producing and distributed 468CC T.japonicum and 788 CC of T. chilonis and 63 kg. of B.bassiana , 375 farmers were benefitted. Identified a native isolate of B. bassiana ITCC 6063 from leaf roller larvae of paddy and standardized the dose as 20 g/l+1ml teepol. Documented the most predominant egg parasitoid of Onattukara paddy fields Tetrastichus sp. | technologies in rice to get an economic pesticide residue free crop, 2. Establishment of a biocontrol lab at ORARS, Kayamkulam for isolation identification and mass multiplication of native strains or isolates of the identified potential natural enemies of the pests and diseases and make available to the farmers | 23.5% over non IPM plots and marginal B:C ratio of 5.9 could, be attained. An IPM demonstration plot was maintained in the station for creative awareness to farmers who visit the station, 2. Mass produced trichocards of the egg parasitoids Trichogramma chilonis against leaf roller and T.japonicum against stemborer in paddy . Isolated a native strain of B.bassiana ITCC 6063 from leaf roller larvae of paddy and standardized a dose of 20 g/l+1 ml teepol against leaf roller of rice. Mass produced B.bassiana talc based formulation. Collected and documented the most predominant egg parasitoid of stem borer in rice Tetrastichus sp. |
| Agri research project | 1.Livestock shed repair 2 no.s 2.Laying road of 100m length 3. Construction Vermicomposting cum work shed. 1 no.4. Fish pond development 1 no. 5. Solar street lighting 1 no. 6. Bio gas plants 3 m3 with biogas lanterns, drier and stoves. 7.Slurry recycling unit 1 no. 8. Reapers 2 nos. weed cutter 1 no. and garden tiller 1 no. | 1.Livestock shed repair 2 no.s 2.Laying road of 100m length 3. Construction Vermicomposting cum work shed. 1 no.4. Fish pond development 1 no. 5. Solar street lighting 1 no. 6. Bio gas plants 3 m3 with biogas lanterns, drier and stoves. 7.Slurry recycling unit 1 no. 8. Reapers 2 nos. weed cutter 1 no. and garden tiller 1 no. | NA | NA |

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| Agri research project | 11.5 acres of Bhagya seed will be production | Bhagya seed production covered 12.5 acres in Chirayilkulam padasekharam of Nooranad | 7 tonnes of TLS paddy seed will be produce | Produced 5960 kg. Bhagya TLS, 827 kg. Uma TLS. Farmers gained technical knowledge in quality paddy seed production |
| | 54,00,000 fodder cuttings will be planned to produce | 13,05,950 fodder cuttings were produced | Area under Fresh fodder production is expected to cover 210 ha | Fresh fodder production in 52.23 ha |
| Agri Research Project | 200 MT quantity of rice seed will be produced | 270 MT quantity of rice seed was produced | 2000 ha area of rice cultivation under this scheme | 2700 ha |
| | 4 | 4 | NA | NA |
| | 20000 ha | 30000 ha | NA | NA |
| | one genotypes were identified, 12 trainings will be conducted. | 15 trainings were given | 1. 10000 ha area will be brought under rice cultivation | 36000 ha area were brough under rice cultivation |
| **Output and Outcome (Andhrapradesh)** | | | | |
| **Research (Agri/Horti/AH.etc)** | | | | |
| Agri research project | Establishment of molecular marker laboratory, and development of 10 improved genotypes | Established molecular marker laboratory at RARS, Jagtial, More than 10 improved genotypes were identified | Identification of Quantative trait locus (QTL) for cold tolerance, By adapting aerobic rice cultivation irrigation water can be saved up to 40 % | Identification of QTLs and mapping population is being generated, Farmers are not adapting aerobic rice cultivation due to low yields, however during water shortage aerobic rice cultivation will be useful |

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| Agri research project | Deveopment of drought resistant groundnut varieties and genotypes resistant to PSND | Dharani , drought tolerant groundnut variety developed,released and notified. Two promising lines are in minikit RILs are available for above ground as well as root traits stage. About 100 lines are in various stages of testing in station trials, Cultures with field tolerance to PSND i.e. TCGS 1157, TCGS 1273 & TCGS 1278 were developed | Developed drought tolerant variety and PSND tolerant variety | Dharani , drought tolerant groundnut variety developed, released and notified, Field tolerant groundnut cultures were developed. TCGS 1157, promosing culture with high yield potential and fileld tolerance to PSND is in on-farm trials |
| | 5 Improved genotypes are in station trials and 5 Promising cultures were identified in station trials | 5 Improved genotypes were identified | By adapting aerobic rice cultivation irrigation water can be saved upto 40% and Approximately 5 improved genotypes | Farmers are not adapting aerobic rice cultivation due to low yields. However, during the water shortage situation aerobic rice cultivation will be useful and More than 600 progenies belonging to different segregation generation (Breeding material) is under study |
| | Analysis of advanced 500 rice cultures for quality traits, Reduction of losses through par boiling in two poular varieties, Evaluation of varieties for their suitability to vermicelli, flaking and popping. Development of 59 rice lines | Analysed more than 500 samples for 17 quality traits, Analysed parboiled samples of MTU 1010 and NLR 3444for milling and physical quality traits, Procured instruments / machinery for value addition and deveoped 59 rice lines | Quality analysis for 500 advanced, pre release and released cultures and identified 15 prominent culrures, Analysis of two parboiled popular rice varieties and found 5-10% increase in head rice, Testing the suitability of varieties for flaking, popping, vermicelli preparation, | Analysed quality properties for 500 advanced, pre release and released cultures and identified 15 prominent culrures, Analysis of two parboiled popular rice varieties and found 5-10% increase in head rice, Testing the suitability of varieties for flaking, popping, vermicelli preparation, |

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| **Output and Outcome (Goa)** | | | | |
| **Animal husbandry** | | | | |
| Breed improvement | 600KG FODDER/DAY | 630KG FODDER/DAY | 600KG | 600KG |
| | 500*8 CALVES | 900 CALVES | Net Gain @ 200gm/Day | 8-10 LTS MILK / DAY |
| Infrastructure | 150 Mt capacity of processing/ storage facility will be created | 100Mt capacity of processing/ storage facility were created | 75Mt | 65Mt |
| **Dairy Development** | | | | |
| Others | 600 kg/unit | As per expectation | 600 kg/unit | As per expectation |
| **Fertilizer and INM** | | | | |
| Soiltesting lab | Four numbers of laboratory Equipment's will be purchased, 12500 soil samples to be analyzed | Three Nos. of laboratory Equipment's were purchased and 7834 soil samples were analyzed | Four numbers of laboratory Equipment's will be purchased, 12500 soil samples to be analyzed | Three Nos. of laboratory Equipment's were purchased and 7834 soil samples were analyzed |
| **Horticulture** | | | | |

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| Others | Shade net structures established at 2 X 100 $m^2$ area, Mother blocks established for Pineapple (818 nos.), Mother blocks established Papaya (150 nos.), 10000 Papaya seedlings produced, 2000 Arecanut seedlings produced, 6000 Chilli seedlings produced, 1900 Marigold seedlings produced, 4000 Crossandra /cuttings seedlings produced, 5000 Cuttings of ornamental seedlings produced and 800 Coconut seedlings produced | Shade net structures established at 2 X 100 $m^2$ area, Mother blocks established for Pineapple (818 nos.), Mother blocks established Papaya (150 nos.), 10000 Papaya seedlings produced, 2000 Areca seedlings produced, 6000 Chilli seedlings produced, 1900 Marigold seedlings produced, 4000 Crossandra /cuttings seedlings produced, 5000 Cuttings of ornamental seedlings produced and 50 Coconut seedlings produced | NA | NA |

**Output and Outcome (Puducherry)**

| **Agricultural mechanization** | | | | |
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| Machine and equipment assistance | transpalntation at a minimum of 4 acre/day for 25 days per season for two seasons with 11 machines (4X25X2X11)=2200 Acres @ rs.2000/acre | transplanted at 1760 acres | Expected income of Rs.44 lakhs (for 2 seasons) | Earned income of Rs.35.2 lakhs (for 2 seasons) |
| | harvesting sugarcane @ 100 tonnes/ day for 100 days per season (100 x 100) 10000 tonnes at Rs. 350/ M.T | Harvestd 7050 MT of sugracane from two seasons | Expected income of Rs. 35 lakhs per seasons | Earned income of Rs. 24.68 lakhs from 2 seasons |

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| **Crop Development** | | | | |
| Others (crop development) | expected yield of 8-9 t/ha | Rice yield increased to 6-7 t/ha | Expected to increase in the yield of 50 per cent | Yield increased to 35 per cent |
| **Horticulture** | | | | |
| Others | 50 per cent increase in the area under horticultural crops | 75 per cent increase in the area under horticultural crops | 50 per cent increase in outcome is expcted | 75per cent income is increased |

**WEST AND CENTRAL REGION**

**Output and outcome (Madhya Pradesh)**

| Project Name | EXPECTED OUTPUT | ACTUAL OUTPUT | EXPECTED OUTCOME | ACTUAL OUTCOME |
|---|---|---|---|---|
| **FISHERIES** | | | | |
| Farmers fish ponds / assistance including training | Construction of 9 Ha seed rearing area | 9 Ha seed rearing area constructed | NA | NA |
| Farmers fish ponds / assistance including training | Increasing fish production | Fish Production increased | NA | NA |
| Innovative programmes | Better quality education to the students | Quality of education improved | NA | NA |
| **RESEARCH** | | | | |
| Agri Research Project | Well equipped seed testing lab is established, | Able to work extensively on seed technology, we are able to interact more efficiently with the trainee farmers, | New and pure varieties may be brought out for use, The training programmes are now more effective tools for inducing the production and productivity of these crops by convincing the farmers. | Better productivity may be achieved, Farmers are now inclined to grow these crops and are enthusiatic.Due to elevated chances of economic returns due to its demand. |
| **SEED** | | | | |
| Seed farm | To mechanize the Breeder Seed Production on Farm the VV | All the Breeder Seed Production Farm of Farm filly Mechanized | NA | NA |

**Output and outcome (Rajasthan)**

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|---|---|---|---|---|
| **AGRICULTURAL MECHANIZATION** | | | | |
| Agri. Mechanization | Establishing of lab facilities to test residues in cumin, testing of sample from farmers | Lab established, protocol for sample testing finalized | Quality of cumin meant for exports to be tested | No samples tested |
| **ANIMAL HUSBANDRY** | | | | |
| Infrastructure | 200 | 194 | 200 | 194 |
| Extension and training | 1 | 1 | 1 | 1 |
| Breed improvement | 350 in third year, Production of elite calves (50% male & 50% female) | 189, Production of elite calves (60% male & 40% female) | Establishment of the centre | Centre established |
| Infrastructure | 15, Facility for education5 years B.V.Sc. & AH Degree Programme | Infrastructure in process of completion B.V. Sc. & A.H. Programme started with existing facilities. | University | project running in third year |
| Extension and training | 200 trainees in one year, increased awareness about balanced animal feed | 200 trainees in one year, increased awareness about balanced animal feed technology | improvement in training imparted to students | |

| | | | | |
|---|---|---|---|---|
| | technology | | | |
| Breed improvement | 350 Up to third year, Production of elite calves (50% male & 50% female) | 101, Production of elite calves (50% male & 50% female) | 200 trainees per year, Increased awareness about balanced animal feed technology for use in the field | The use of knowledge of balanced animal feeding in field by trainees will improve health status of animals. |
| Breed improvement | 350 in 3 years, Production of elite calves (50% male & 50% female) | 231, Production of elite calves (50% male & 50% female) | For the university | project running in third year |
| Breed improvement | 350 in 3 years, Production of elite calves (50% male & 50% female) | 231, Production of elite calves (50% male & 50% female) | For the university | project running in third year |
| Animal health | 60, Training of B.V. Sc. & A.H. students | Facilities for Surgery, Gynecology, Medicine Clinics, outdoor, Indoor, Separation theatre and all diagnostic facilities created for Veterinary care. | Reduction in the mortality in animals in the area due to diseases. | Reduction in the mortality in animals in the area due to diseases. |
| **COOPERATION AND COPERATIVES** | | | | |
| Other facilities | Collection of the germplasm of Kasuri Methi (16), High yielding genotypes | 16 elite genotypes collected, 14 genotypes identified for high yeilding | Genotypes identified will be high yeilding, High yielding with good aroma | 14 genotypes were identified so far, Work in progress for further selection for good aroma genotypes |

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| **CROP DEVELOPMENT** | | | | |
| Others | Fodder Research & demonstrations in 3distt viz., SGNR Bikaner, & SIkar of Western Rajasthan. Seed production of fooder crops in Farmers Participatory Mode for regional requirement, Enhancement of green fodder & Seed production under limited water conditions | Fodder Research & demonstrations in 3distt viz., SGNR Bikaner, & SIkar.In 2011-12 Rabi & Bikaner, Sikar in kharif 2012. Seed production of fooder crops in FP Mode for own requirement, Enhancement in green fodder by 20-30% over local & limited Seed production under limited water condition | Fodder Research & demonstrations in 3distt viz., SGNR Bikaner, & SIkar of Western Rajasthan. Seed production of fooder crops in FP Mode for regional requirement, Enhancement of green fodder & Seed production under limited water | 15 trials &156 demonstrations were laid out in 2011 (Rabi )& 2012(kharif) in 3 districts. And about 30% GFY increase was noted over local, Farmers satisfied & harvested good quality green fooder for their livestock. Also quality seed to meet own requirement |
| Water conservation structures and watershed dev | Finding out optimum plant geometry and irrigation scheduling through drip, Good quality food grain production | Optimum plant geometry and irrigation scheduling, Good quality food crops | Optimum plant geometry and irrigation scheduling have been worked out, Good quality food crops have been produced | Optimum plant geometry and irrigation scheduling have been worked out, Good quality food crops have been produced |
| **ORGANIC FARMING** | | | | |
| Organic farming, bio fertilizer development | Development of organic farming, To refine POP for organic farming | Refinement of POP in Organic farming for seed spices and vegetables, Demonstration of the effect of organic farming on soil health and crop | Refinement of POP in Organic farming, POP for organic cultivation of seed spices and vegetables in farmers' fields | PoP finalized for organic farming in farmers field, PoP finalized for organic farming in farmers field |

| | | | | |
|---|---|---|---|---|
| **RESEARCH** | | | | |
| Agri research/ teaching facility (infrastructure) | farm development lab facilities, boundary wall constructionirrigation facilities farm implements lab implements | Construction of boundary wall Development of irrigation facilities Laboratory strengthens, Farm fencing water conservation Tube well Soil and water testing laboratory | Development of farm and lab facility, Construction or fencing Irrigation facility & testing facility for soil and water | Labfacilities and development of instructional farm, Farm fencing completed Tube well constructed laboratory equipments purchased |
| Agri research project | validation & refinement of pop at farmers field, verification of pop based on crop production | Validation of technologies at different agro ecological situations, Based on micro climate condition the technology was verified and modified accordingly | Development of POP as per agro ecological situation, POP was refined based on agro ecological situation | POP was modified in 7 agro climate zones of the state, The new POP is more site specific & farmers friendly |
| Others (reserch-agri, horti & animal husbandry) | production of vegetable seed, disease free production of vegetable seed & planting material through protected cultivation | Seed planting material of vegetables and flowers, Disease free Vegetable seed production of Okra, tomato, brinjal, onion, bottle guard, spinach , marigold etc | Vegetable seed production and planting material (500 kg), Quality seed production of high yielding vegetables | Seed of major vegetables and and their material was produced and distributed among farmers (650kg of vegetable seed produced), Seed of Okra, tomato, brinjal, onion, bottle guard, spinach, and marigold was produced using protected cultivation |
| Agri research project | compare water use efficiency in both the methods of irrigation, drip irrigation scheduling | Suitable irrigation level, Plant geometry of groundnut | Saving of water for groundnut cultivation, Compare the economics of both method of irrigation | Drip irrigation schedule finalized, Economical study shows that drip irrigation is more beneficial for groundnut cultivation also for soil health |

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| Agri research project | wheat varieties to be evaluated for heat tolerance, heat tolerant varieties be identified based on fild as well as lab studies | 16 varieties were evaluated, 3 promising varieties have been identified for further evaluation | Some (3-4) heat tolerant varieties have been identified, Based on physiological and Bio chemical parameters for heat tolerance were studied | 3 varieties have been identified, Lab studies and field trials data supports the heat tolerant varieties identified |
| Agri research project | validation & refinement of chickpea genotypes through marker assisted breeding, evaluation of qtls for drought tolerance | Selected high yielding QTLs having disease & pest resistance, Selected high yielding QTLs having better seed size and colour | Development of high yield potential QTLs which will be converted into variety, Development of QTLS having good quality grain with high protein | Development of high yielding drought tolerant ,resistant to biotic stresses, Development of high yielding drought tolerant, good quality seed /grain |
| Agri facility | sewan seed production programme in 200 ha. area to meet estimated seed requirement of about 2500-2800 quintals for sewan pasture development in arid region by ifferent organizations. experimentation at ars bikaner to fulfill the objectives, collection of good quality seed of sewan grass for pasture development | About 250 ha. Area under Sewan grass was sown in collaboration with NGO at Shre nathania Gochar land. Also, field trials at ARS Bikaner was sown to fulfill objectives, Limited quality seed was harvested from field trials and ARS Sewan pasture block for further use. | Sewan seed production programme in 200 Ha. Area to meet estimated seed requirement of about 2500-2800 quintals for Sewan pasture development in arid region by different organizations, Collection of good quality seed of Sewan grass for pasture development | About 250 ha. Area under Sewan grass was sown in collaboration with NGO at Shre nathania Gochar land. Also, field trials at ARS Bikaner was sown to fulfill objectives, Limited quality seed was harvested from field trials and ARS Sewan pasture block for further use. |
| Agri research project | 20 | 5 | 20 | 5 |

| | | | | |
|---|---|---|---|---|
| Agri research project | 1 | | To develop Lab with facilities for biotechnological study | Work in progress |
| Agri facility | Establishment of FIMTTC, Testing of farm implements | Testing is done of all the implements ts reached to SKRAU, Bikaner | The implements are not up to the mark, CTR not provided | Testing is an continuous process, however, in the year 2011-12, 49 implements were tested, Only based on quality the implements were given CTR |
| Seed production | Development of infrastructure facilities at seed producing units, To facilitate better facilities for quality seed production | Farm development work & farm implements, Construction of seed storage godowns & establishment of processing units, Farm facilities helped in increasing the production & processing units helped in quality control | To increase seed production and maintain quality also, To improve seed supply chain | Breeder seed production was increased to fullfill increasing demand of the state, Increased seed production helped in improving SRR & ultimately crop production of the state |
| Others (seed) | Construction of Four screen house s and two net houses, Mother progeny developed | Construction of Four screen house and two shade houses completed, Raising of protected nursery of kinnow and sweet orange plants | Multiplication of virus free plants of kinnow and sweet orange, Establishment of disease free kinnow Rootstock raising and budding is being carried out inside the net house | Disease free plants have been transplanted inside the screen house house, Plants multiplied using protocol hardened and transplanted in screen |

**Output and outcome (Chattishgarh)**

| Project Name | Expected Output | Actual Output | Expected Outcome | Actual Outcome |
|---|---|---|---|---|
| **ORGANIC FARMING / BIO FERTILISER** | | | | |
| Establishment of Bio-fertilizer Unit | 1 | 1 | 150 MT | 276 MT |
| Establishment of Automatic Bottle Filling machine & Autoclave for Biofertilizer Plant | 1 | 1 | 150 MT | 630 MT |
| Establishment of Automatic Bottle Filling machine & Autoclave for Biofertilizer Plant | 45000 MT | 45000 MT | 31500 MT | 3150 MT |
| Establishment of Automatic Bottle Filling machine & Autoclave for Biofertilizer Plant | 58 TPH | 58 TPH | 58 TPH | 58 TPH |
| **SEED** | | | | |
| Strengthening of State Seeds Corporation | 4 | 4 | 20000 Ha | 26456 Ha |
| Strengthening of Seed Processing Center | 21 | 21 | 30000 Ha | 33853 Ha |
| Incentive to Seed Growers | 300000 Q | 299000 Q | 30000 Ha | 33853 Ha |

| | | | | |
|---|---|---|---|---|
| Incentive to Farmers for Seed Production (Paddy and Wheat), | 372000 Q | 372000 Q | 35000 Ha | 40282 Ha |
| Strengthening of Seed Processing Center | 4 | 4 | 35000 Ha | 40282 Ha |
| Seed Production Subsidy | 407000Q | 407000 Q | 45000 Ha | 46005 Ha |
| Seed Distribution Subsidy (Cereals, Pulses & Minor millets), | 178000 Q | 178000 Q | 510000Q | 510000 Q |
| Assistance for Seed Procurement | 30000Q | 30000 Q | NA | NA |
| Construction of Seed Godown (1500 MT) | 7 | 7 | 45000 Ha | 46005 Ha |
| Strengthening of Seed Corporation | 4 | 4 | 45000 Ha | 46005 Ha |
| Production Subsidy (Paddy and Wheat) | 620000 Q | 620000 Q | 50000 Ha | 51032 Ha |
| Distribution Subsidy (Arhar, Moong, Urad) | 4960 Q | 4960 Q | NA | NA |
| Distribution Subsidy (Paddy and Wheat) | 241000 Q | 241000 Q | NA | NA |
| Distribution Subsidy (Kodo and Ragi) | 335 Q | 335 Q | NA | NA |

| | | | | |
|---|---|---|---|---|
| Godown Construction (1500 MT) | 3 | 3 | 4500 MT | 4500 MT |
| Seed Grading Machine | 3 | 3 | 9 T.P.H | 9 T.P.H |

**Output and outcome (Maharashtra)**

| **ANIMAL HUSBANDRY** | | | | |
|---|---|---|---|---|
| Building Infrastructure for cattle market at Palghar | 1 Cattle market | 1 Cattle market | 1 Cattle market | 1 Cattle market |
| Supply of Mini Hatchery Units to Self Help Groups | 300 mini hatchery units of 400 hatching egg capacity | 300 mini hatchery units of 400 hatching egg capacity | NA | NA |
| Strengthening And Modernization of Frozen Semen Laboratory, Mula Road, Pune-03 | To increase frozen semen doses production | Production of FSD Increased from 10 lakh to 10.64 lakh | To incraese frozen semen doses production | Additional reciept of 29.40 lakh by sale of FSD |
| Production of Improved Breeds of Sheep & Goat Through strengthening of sheep & goat breeding farms of Punyashloka Ahilyadevi Maharashtra Mendhi Va Sheli Vikas Maamandal | Increased carrying capacity of 3500 Rams & Bucks | Increased carrying capacity of 3000 Nos. | NA | NA |

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|---|---|---|---|---|
| Establishment of Small Ruminant Market Yards | Establishment of small ruminants market yards at premises of agricultural produce market committee in state(10 in number) | Established 10 small ruminants market yards at premises of APMC at Lonand, Jath, Daryapur, Lakhani, Chalisgaon, Khed, Sangola, Tuljapur, Kalamb & Kalamnuri | | |
| Grassland Development including grass reserves at agricultural farm, Sunegaon, Ahmedpur, COVAS, Udgir, Latur | NA | Development of buffer stock to meet the requirement of green fodder to the farmers who have adopted new technique | NA | NA |
| Establishment of "Turkey Farming Training Centre" at Krantisinh Nana Patil Veterinary College, Shirval, Satara | Training to 300 farmers | 300 Farmers were Trained | NA | NA |
| Establishment of Cytogenetic Investigation Laboratory | NA | NA | Analysis of 500 animals. Detected and prevented of about 5 defective cattle and buffalo depending on sample size communicated | Analysis of 500 animals. Detected and prevented of about 5 defective cattle and buffalo depending on sample size communicated |
| Establishment of Cytogenetic Investigation Laboratory | NA | NA | Prevention of about 4 defective cattle and buffalo Native breeds | Prevention of 13 defective cattle. Dangi breed of cattle with major genetic defects |

| | | | | |
|---|---|---|---|---|
| Establishment of Cytogenetic Investigation Laboratory | NA | NA | Infrastructure/ teaching facility for animal genetics department | Infrastructure/ teaching facility for animal genetics department |
| Breed Village Scheme for Sheep and Goat | Supply of improved 8493 Rams & Bucks for genetic upgradation of ND & Sheep & Goat | Distributed 8493 Rams & Bucks To the Farmers | NA | NA |
| Breed Village Scheme for Sheep and Goat | 50000 expected progeny produce per year | In the year of 2012 the total 58679 upgraded progeny has been produced by breeding of distributed males under the scheme. Collection of Data for the year 2013-14 is under process | NA | NA |
| Improving AI Delivery System | 1185 AI Delivering systems to be established for 2 years | 978 AI delivering system established | NA | NA |
| Improving AI Delivery System | 801 were to be appointed to establish AI delivering system | 801 were appointed | NA | NA |
| Grassland Development Scheme | Aimed to develop 10 acres of grassland of different fodder crops | Developed 8 Acres(Yeshwant, Jaywant, DHN-6, Marvel, Stylo, Hemata ) | | 256400 stumps of various green fodder crops sold to farmers |
| CROP DEVELOPMENT | | | | |

| | | | | |
|---|---|---|---|---|
| Strengthening of Bio Control laboratory | 30 Ton biopesticides to be produced | 28 Ton biopesticide was produced | NA | NA |
| **DAIRY** | | | | |
| IDFP | 100 cows | 100 cows | 1000 Lt. Milk | 260 Lt. |
| IDFP | 100 cows | 100 cows | 45 calves | Healthy Calf |
| Integrated Dairy Farm Park | 100 milking CB. Cows/graded buffaloes | 100 graded buffaloes | 1000 lits per day | 800 lits per day |
| Integrated Dairy Farm Park | 2/3 hactare | 30 acre | civil construction such as cattle shed, calf shed, store hall & cultivation of green fodder | Green fodder yielding for 1000 milk animals |
| Integrated Dairy Farm Park | 6000 sq. ft. area required for cattle shed as per type plan & basic requirements | Sufficient space & essential construction as per type plan & basic requirements is constructed | Plan area 27ft x 200ft=5400 sq. ft. | Built up area 27ft x 200ft=5400 sq. ft. |
| Integrated Dairy Farm Park | 1000 sq. ft. store room with office as per type plan & basic requirements | 1000 sq. ft. store room with office is constructed | Plan area 18.6 ft. x 28.6 ft.= 900 sq. ft. | Built up area 20 ft. x 50 ft. = 1000 sq. ft. |
| Integrated Dairy Farm Park | 600 sq. ft. calf shed as per type plan & basic requirements | 600 sq. ft calf shed as per type plan & basic requirements is constructed | Plan area 18.6 ft. x 28.6 ft.= 534 sq. ft. | Built up area 20 ft x 20 ft=400 ft |
| Integrated Dairy Farm Park | Rs. 1.30 lakh available towards milk animal | Rs. 2,34,047 lakh actual expenditure on insurance | To restore milk animals strength & protect the beneficiaries from | Yes it is to be beneficial as on death of animals and 3 beneficiaries gets their |

| | | | | |
|---|---|---|---|---|
| | insurance | | animal loss by disease or any natural calamities | benefits on the incidence |
| Strengthening/ Modernization of the college of Dairy Technology, Pusad and Training to the Dairy Professionals and farmers under RKVY | Purchase of equipments costing around Rs. 7700000 | Purchased of around 5142731 | NA | NA |
| Strengthening/ Modernization of the college of Dairy Technology, Pusad and Training to the Dairy Professionals and farmers under RKVY | Rs. 1000000 was decided to be spent for training on 250 farmers | Rs. 632740 was spent for training of 283 farmers | NA | NA |
| Strengthening/ Modernization of the college of Dairy Technology, Pusad and Training to the Dairy Professionals and farmers under RKVY | Rs. 1000000 to be spent for renovation of colleges and modernization of training hall | Rs 941577 was spent for the same | NA | NA |
| Strengthening/ Modernization of the college of Dairy Technology, Pusad and Training to the Dairy Professionals and farmers under RKVY | Rs. 300000 to be spent for purchase of new books and journals for the college library | Rs 299700 was spent for library books and journals | NA | NA |

**Output and outcome (Gujarath)**

| **ANIMAL HUSBANDRY** | | | | |
|---|---|---|---|---|
| Enrichment of Agricultural wastes for enhancement of nutritive value in Gir and Jaffrabadi animals and recycling of animal wastes for promoting organic wastes<br>Duration: Three years<br>Sector: Animal Husbandry | 255 cubic meter gas generation , 5 tons / week of slurry , 20-25 tonns/groundnut haulms and 20 tons of wheat straw processing , 500 kg / hour pellet making and 15 blocks each weighing 3 kg per hour | 5 tons/ week slurry 255 cmt. gas generation capacity installed, 40-45 tons of agri-byproduct processing capacity , Pellelts/ roughage blocks can be prepared | Power generation for water supply from well, 2-3 tons of slurry for manuring the fields, ,Processing of g.nut haulms and wheat straw up to 40-45tons, Pellets/blocks to be prepared | Reduction in power bill up to Rs 25,000/p.m.,Organic manure in the farm of slurry @ 2-3 tons /week applied to agriculture fields, Processing of g.nut haulms and wheat straw up to 40-45tons, So far, 10 tons of pellets and 1000 roughage blocks were prepared, |
| | 200 sq.mts laboratory space renovation and expansion | 200 sq.mt lab space expanded | 200 sq.mt lab space expanded | 500 milk, 100dung,300 feed and fodder samples were analyzed |
| | 4500 sq.mts animal shed area renovation for hygienic animals husbandry practices and dung collection. | 4100 sq.mts animal sheds renovated | 4100 sq.mts animal sheds renovated | 4100 sq.mts animal sheds renovated |

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|---|---|---|---|---|
| Use of recent molecular techniques to reduce economic losses incurred due to bovine mastitis by evolving diagnostic therapeutic and preventive measures | Documentation of microorganisms causing bovine mastitis, understanding its etiopathology, and developing diagnostic approach. | Identification microorganisms causing bovine mastitis. | 1. Prevalence of sub-clinical intramammary infections. | The overall prevalence of subclinical mastitis cows was recorded to be 66.67 per cent. |
| | | Results of Real time PCR indicated TLR 2, TLR 4 and TLR 9 gene expression in cows affected with SCM compared to non-mastitic cows. | 2. Compatibility of mastitis markers with bacteriological culture examination. | Compatibility of SCC, pH and EC with the results of bacteriological culture examination was observed to be 63.85, 58.82 and 58.06 per cent. |
| | | The findings of in the study may help in formulating strategies for prevention and treatment of mastitis in dairy animals and consequently in reducing economic losses incurred due to it. | 3. Microbiological cultural examination. | A total of 156 qms (collected from 103 sub-clinically affected (SCM) quarters and 53 from healthy quarters) were subjected to PathoProof mastitis PCR assay for comparing its results with bacterial culture. On bacteriological culture examination, 93 (90.29 %) out of 103 qms from SCM quarters. |

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| | | NA | 4. Antibiogram pattern of bacterial isolates from three breeds. | The expression levels of IL-6, IL-8, IL-12, GM-CSF, IFN-γ and TNF-α cytokine genes were observed. Minimum inhibitory concentration for 10 conventional antibiotics against 4 typed and 11 field isolates for evaluation of the antibacterial activity (quantitative) exhibited amikacin, ciprofloxacin, co-trimoxazole and gentamicin as most effective antibiotics and showed MIC < 1.0 g/ml against all 15 bacterial isolates whereas streptomycin was least effective with MIC 1.0 g/ml against 11 (73.33 %) isolates. |
| | | NA | 5. Evaluation of therapeutic potential of *prosopis juliflora* leaf extract in subclinical mastitis and cytokines expression profiles study in cows before and after treatment. | On intramammary infusion of *P. juliflora* alkaloids, 18 (75 %) treatment group quarters each showed bacteriological cure as well as significant ($p<0.05$) reduction in SCC on day 28 post-last treatment. |
| | | NA | 6. Evaluation of immnomodulatory activity of a herbal drug in the treatment of bovine sub-clinical mastitis. | Out of 24 treated quarters, 14 (58.33 %) quarters showed both bacteriological cure as well as significant ($p<0.05$) reduction in SCC on day 28 post-last treatment. |

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|---|---|---|---|---|
| | | NA | 7. Sensitivity, specificity and predictive ability of mastitis markers. | While investigating the immunomodulating potential of P. juliflora alkaloids, except IL-1β, the expression level of all the cytokines (IL-6, IL-8, IL-12, GM-CSF, IFN-γ and TNF-α) showed significant increase on day 7 and 14 and a decrease was observed on day 21 post-treatment in treatment group quarters. |
| "Biotechnological Approach for Containment of Animal Diseases" (B. H. 18366) | Base level survey of mastitis in field | Research methodology is finalized and pilot project work has been completed. | NA | NA |
| | Sample collection and confirmation of the disease by presently available tests | Standardization of macrophage culture is in progress. | NA | NA |
| | Whole genome sequencing of buffalo genome (Four breeds of Gujarat). | Sample collection, DNA extraction and sequencing of 64242 nuclotide has been completed. | NA | NA |
| | Establishing models for creation of surgical adhesion. | Literature survey has been completed. | NA | NA |
| | Calves 2500 Nos | 2792 Calves | NA | NA |

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|---|---|---|---|---|
| Calf rearing | Strengthening the laboratory facilities with building and instruments. | The laboratory facilities required for analysis of samples of degrade/waterlogged soils | Particular area identified for reclamation of degraded and waterlogged soil, | Large no. of soil samples collected from the degraded and waterlogged soils area and analysed |
| COOPERATIVES AND COOPERATION | The increased the productivity of seed which is gave better yield in degraded and waterlogged soils through increase fertility and infrastructure facilities | The produced more breeder seed and truthful seeds | The farmers of this area can harvest more yield with improved seeds | The large numbers of farmers have adopted the new technology with improved seed materials |
| CROP DEVELOPMENT | Strengthening the training facilities and capacity buildings. | Strengthen the seminar hall and training materials for capacity building and technology for soil reclamation | The nos. of farmers are ready to adopt the new technology after seeing the demonstration. | The increase the production of crop after adopting new technology after getting training |
| Maximization of crop productivity in saline and water logged area | 100 | 100 | | |
| | 100 | 100 | | |
| **DAIRY DEVELOPMENT** | | | | |
| Clean Milk Production in Kheda District | 1 | 1 | 1 | 1 |

| **EXTENSION** | | | | |
|---|---|---|---|---|
| Establishment of Advance Training Centre for Farmers at Amreli | Development of **1** high tech exhibition comprising static and dynamic demonstration models with special reference to seed and seed production technologies and training of **180** farmers/ students per year in this respect. | Developed **1** high tech exhibition comprising static and dynamic demonstration models with special reference to seed and seed production technologies and trained more than **180** farmers/ students per year. | Updation of knowledge and dissemination of knowledge with special reference to seed and seed production technologies of at least **180** farmers per year through high tech exhibition. | Updated and disseminated the knowledge with special reference to seed and seed production technologies through high tech exhibition of more than **180** farmers/ students per year |
| Expansion of Boys hostel facilities for UG/PG students | 1 | 1 | 1 | 1 |
| Transfer of Integrated Agriculture Technologies through Village Adoption<br><br>Diversified cultivation for value added maize | 3 QPM composites | 2 | | |
| | 4 High oil composites | 3 | | |
| | 5 Swwet corn composites | 3 | | |
| | 3 Baby cron composites | 2 | | |
| | 2 Baby corn hybrids | 2 | | |

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| | Organic farming | farmers of adopted villages (4750 beneficiary) had given AGRO Shed Net, Earthworms, Vermibeds, Bio-fertilizers, Demonstration on preparation of vermi compost, green Manuar, training on Organic farming, Publication etc. (No. of beneficiary as per list) | Adoption of organic farming at farmers of adopted villages, decrease cost of production & save the environment | Adoption of organic farming at farmers of adopted villages, decrease cost of production & save the environment |
| | Introduction & adoption of SRI for Paddy growers at all adopted villages (15) | farmers of adopted villages had given improved Paddy seeds, Demonstration on Nursery Management, Plantation, Inter culturing by conoweeder, use of Bio-fertilizer, Bio-Pesticide, Neem coated Urea, Harvesting, Marketing etc | Adoption of SRI technique at farmers of adopted villages | Decrease cost of Paddy cultivation & save the Environment (less consumption of seed, water, fertilizer & Pesticides |
| | TOT by training at adopted villages | Knowledge skill & attitude of farmers change by training programmes | Organize Shibir & Programme for adopted villages | Farmers of adopted villages shift to advance farming with training programme |

| | | | | |
|---|---|---|---|---|
| RKVY (stream-I) Innovative approach for Agricultural Extension activities by village adoption. B.H.-18376 | Improvement of ATIC building, conference hall ,scientific instrument for research, office equipments etc. | Use for training programme for adopted villages farmers | Make source for knowledge distribution for farmers & facilities | Physical facility improved for farming community |
| RKVY (stream-I) Innovative approach for Agricultural Extension activities by village adoption. B.H.-18377 | cattle camp organize at all adopted villages | Farmers changed dairy farming & take proper care of animal health after cattle camp & training during programme | Distribute different products for their advantages & change to benificiary dairy farming | list attached |
| RKVY (stream-I) Innovative approach for Agricultural Extension activities by village adoption. B.H.-18378 | awareness, interest & knowledge gain by tot & publication | Make them aware for beneficiary thoughts | Make channel distribution & planning to give knowledge step by step of different different topic knowledge | Many farmers awre by the publications & changed their farming at beneficiary & scientific level |
| RKVY (stream-I) Innovative approach for Agricultural Extension activities by village adoption. B.H.-18379 | distribution of agroshed net house for cultivation/nursery | give demonstration on their field | give proper knowledge with demonstration | (No. of beneficiary as per list) |
| RKVY (stream-I) Innovative approach for Agricultural Extension activities by village adoption. B.H.-18380 | Trainings :50 | Trainings:53 (5520 beneficiaries) | Trainings:50 (5000 beneficiaries) | Trainings:53 (5520 beneficiaries) |
| RKVY (stream-I) Innovative approach for Agricultural Extension activities by village adoption. B.H.-18381 | Awareness Programs :5 | Awareness Programs:8 (2338 beneficiaries) | Awareness Programs:5 (1500 beneficiaries) | Awareness Programs:8 (2338 beneficiaries) |

| | | | | |
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| RKVY (stream-I) Innovative approach for Agricultural Extension activities by village adoption. B.H.-18382 | Renovation of Farmers Hostel | Renovated of Farmers Hostel | Renovation of Farmers Hostel | Renovation of Farmers Hostel |
| Agricultural Extension Activities for specialized agricultural innovations | 1. Hostel facilities for farmers trainees & students | Const. of Boy's hostel at AAU, Baroda | NA | NA |
| Agricultural Extension Activities for specialized agricultural innovations | 2. Hostel for farms Women / Girls students | Ren / stren. of toilet block of Vet. 'c' hostel at AAU, Anand. | NA | NA |
| Agricultural Extension Activities for specialized agricultural innovations | 3. Facilities of Classroom for trainees / students | Extension of Girls hostel for women farmers at Vet. College at AAU, Anand | NA | NA |
| Establishment of education & extension facilities for farmers and students at SAUs – (1) Hostel facilities for farmers trainees & students (2) Hostel for farms Women / Girls students (3) Facilities of Classroom for trainees / students (4) Development of new amenities for training centre | NA | Cons. Of Class room/ laboratory for Agriculture at AAU, Anand. | NA | NA |

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| Establishment of education & extension facilities for farmers and students at SAUs – (1) Hostel facilities for farmers trainees & students (2) Hostel for farms Women / Girls students (3) Facilities of Classroom for trainees / students (4) Development of new amenities for training centre | NA | Const. of third floor of P.G. hostel at AAU, Anand. | NA | NA |
| Establishment of education & extension facilities for farmers and students at SAUs – (1) Hostel facilities for farmers trainees & students (2) Hostel for farms Women / Girls students (3) Facilities of Classroom for trainees / students (4) Development of new amenities for training centre | NA | Const. of First floor of PG Girls hostel at AAU, Anand. | NA | NA |
| Establishment of education & extension facilities for farmers and students at SAUs – (1) Hostel facilities for farmers trainees & students (2) Hostel for farms Women / Girls students (3) Facilities of Classroom for | Civil work of T&V Hostel | Completed T&V Hostel | Completed T&V Hostel | Completed T&V Hostel |

| | | | | |
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| trainees / students (4) Development of new amenities for training centre | | | | |
| Establishment of education & extension facilities for farmers and students at SAUs – (1) Hostel facilities for farmers trainees & students (2) Hostel for farms Women / Girls students (3) Facilities of Classroom for trainees / students (4) Development of new amenities for training centre | Renovation of ATIC Hostel | Renovation of ATIC Hostel | Completed Renovation of ATIC Hostel | Completed Renovation of ATIC Hostel |
| Infra.in Gadat and Doaval APMC Vyara | About 2000 soil and plant samples will be collected from standing field of groundnut and cotton crops of different talukas of seven districts of Saurashtra region. | From each taluka of Saurashtra region 990 plant and soil samples in year 2010-11 and 1013 plant and soil samples in year 2011-12 from the standing crops of groundnut and cotton were collected for diagnosis of nutrient deficiency. All 2003 soil and plant samples were analyzed | It is estimated that 10 percent productions will enhance at state level | About 85-90% farmers were noted that the after application required recommended dose of fertilizer, the growth and yield of both crops were increased |

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| | | organic carbon, available phosphorus, potassium, sulphur, iron and zinc. | | |
| **FERTILISERS AND INM** | | | | |
| | 8 training/ year | 3 training/ year | 200 trained person/year | 200 trained during the programme |
| On season crop field nutrient monitoring of Groundnut and Cotton in Saurashtra region | 1 Training centre at college level | 1 Training centre | One department of fish processing technology development | One Training centre for college developed |
| **FISHERIES** | | | | |
| Training programme on value added fishery products at veraval | Orchard Development | Orchard Developed | Orchard Development | Orchard Developed |
| Establishment of modern nursery for propagation and popularization of planting materials | b) Sweet orange orchard development (Area=0.61ha) | b) Sweet orange orchard development (Area=0.61ha) | b) To develop orchard for various research components like WUE, IWR, adv. methods, scheduling, moisture dynamics, etc. | b) Facilities developed for various research components |
| Developement of Technologies for High Valued Fruit Crops for Tribal areas | c) Pomegranate orchard development (Area=0.52ha) | c) Pomegranate orchard development (Area=0.52ha) | NA | NA |

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| Developement of Technologies for High Valued Fruit Crops for Tribal areas | d) Custard orchard development (Area=0.70ha) | d) Custard orchard development (Area=0.70ha) | NA | NA |
| Developement of Technologies for High Valued Fruit Crops for Tribal areas | e) grapes orchard development (Area=0.04ha) | e) grapes orchard development (Area=0.04ha) | NA | NA |
| Developement of Technologies for High Valued Fruit Crops for Tribal areas | Orchard development for demonstration and training on production and processing of high value fruit crops (Cashewnut, sweet orange, pomegranate, custard apple and grapes) | Orchard developed for demonstration and training on production and processing of cashewnut, sweet orange, pomegranate, custard apple and grapes | For demonstration & training nearby farmers, SHG, etc. for the promotion on the production of high value fruit crops (cashewnut, sweet orange, pomegranate, custard apple and grapes) | Production and promotion of high value fruit crops for demonstrate and trainings. |
| Developement of Technologies for High Valued Fruit Crops for Tribal areas | Development of processing facilities for high value fruit crops (sweet orange, cashewnut, pomegranate) | Procured and installed following machineries; (sorting/grading line for round fruits, pulper, bottle filling machine, cashewnut processing machine, pomegranate peeling and crushing machine) | To provide hands on training to farmers, UG/PG students on process development. | Demonstrated the processing machinery to farmers, UG/PG students, visitors, etc. |

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| Developement of Technologies for High Valued Fruit Crops for Tribal areas | Development of farm and processing labs. | Developed various orchards of high value fruit crops and procured various processing machineries for high tech labs. | Enhancement of students practical facilities, Research and development | Facilities developed |
| Developement of Technologies for High Valued Fruit Crops for Tribal areas | Irrigation Facilities | Irrigation Facilities | Irrigation Facilities | Irrigation Facilities |
| Developement of Technologies for High Valued Fruit Crops for Tribal areas | a) Development of advance irrigation & fertigation system (Area=2.4ha) | a) Development of advance irrigation & fertigation system (Area=2.4ha) | a) To develop adv. Irrigation cum fertigation system for orchards. | a)development of advance irrigation system for orchards |
| Developement of Technologies for High Valued Fruit Crops for Tribal areas | Monitoring and evaluation | Measurement of various physiological growth of plants, fruits with various irrigation/ fertigation techniques for high value crops | NA | Data will be analyzed for prescribing varietal preference of high value crops for the replication at tribal farmers level |
| Developement of Technologies for High Valued Fruit Crops for Tribal areas | 1, 14,100 | 1, 14,100 | 1, 14,100 | 1, 14,100 |
| Developement of Technologies for High Valued Fruit Crops for Tribal areas | The uncultivable problematic soils of the coastal area will be brought under cultivation | Cultivation of groundnut and cotton crop was done after the implementation of project ,• Reduction in salinity and sodicity of the | Remotely monitoring and precisely managing soil and water chemical parameter has been made via FarmLinc portal with | The FarmLinc system along with different sensors were installed for remotely monitoring the data of the project site. The |

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| | . | soil during experimental period was observed, | the help of internet connectivity. | catalytic water conditioner was installed. |
| **INNOVATIVE PROGRAMMES/ TRAINING/ CAPACITY BUILDING/ OTHERS** | Milk with low somatic cell count <5,00,000 | Mini dairy plant with 200LPH for milk processing | around 700 L of cow and buffalo milk was pasteurized and processed | Clean production resulted in an income of Rs 64 lakhs |
| Centre of Excellence for Agro meteorological Services at Junagadh | Biogas convertion to electricity | Generator for biogas conversion | Around 500 cu.mt of bio gas generated | Reduction electricity bill up to Rs 25,000/p/m |
| Smart farming for increasing agricultural production in sodic soils of coastal area of Saurashtra | Biogas convertion to electricity | Generator for biogas conversion | Around 500 cu.mt of bio gas generated | Reduction electricity bill up to Rs 25,000/p/m |
| Development of modules for Precision Dairy farming for Gir cattle and Jaffrabadi buffaloes | Infrastructure for modern feeding, watering and breeding to be estalished | These modules could not be established for want of grant allocation | These modules could not be established for want of grant allocation | These modules could not be established for want of grant allocation |
| Development of modules for Precision Dairy farming for Gir cattle and Jaffrabadi buffaloes | facilities of the project | infrastructure facilities of the project | NA | NA |
| "Increasing Milk Production by Recent Biotechnological Approaches"(B. H. 18440) | 93 | 93 | NA | NA |
| MARKETING AND POST HARVEST MANAGEMENT | 8 | 10 | 8 | 10 |

| | | | | |
|---|---|---|---|---|
| Referral Laboratory for Food Testing and Quality Control | 3 | 2 | | |
| facility for Fruit & Veg | 1 | 1 | 1 | 1 |
| SETTING UP" VPMC"AT NANA PONDHA VILLAGE VALSAD DIST | Sampling, Isolation & identification of Trichoderma strains | Isolated and identified different Trichoderma spp. from different crops. | Area specific efficient strains of Trichoderma | T. asperillum isolated and identified |
| Establishing bulk warehouse with scientific management on PPP mode in APMC for agro and horticulture produce | Demonstration and training to farmers, KVK and NGO's,etc. | Training to Tribal Farmers and Farmers as per attached. | Experiential learning and hand on training to B.Sc (Agri) students of VIII semester. | More than 35 students got Training in last two years under ELP program |
| | Strengthening of labs for mass production of Trichoderma. | Mass production lab has been established. | Development of protocols for mass production of Trichoderma. | Protocol on fermentation technology of Trichoderma developed |
| **ORGANIC FARMING / BIO FERTILISER** | | | | |
| Transfer of Mass production technology of efficient and pesticides tolerant biocontrol agents *Trichoderma* spp. to farmers for sustainable management of plant diseases | Production & selling of *Trichoderma viride*. | Sold Anubhav *Trichoderma* to farmers. | Large scale production and sale of *Trichoderma* | Around 2000 kg of Anubhav *Trichoderma* was produced and sold to farmers. |

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| Transfer of Mass production technology of efficient and pesticides tolerant biocontrol agents *Trichoderma* spp. to farmers for sustainable management of plant diseases | 10 | 10 | NA | NA |
| Transfer of Mass production technology of efficient and pesticides tolerant biocontrol agents *Trichoderma* spp. to farmers for sustainable management of plant diseases | 15 | 15 | NA | NA |
| Centre of Organic Farming (RKVY) | 2 | 1 | NA | NA |
| Centre of Organic Farming (RKVY) | 14 | 14 | NA | NA |
| Centre of Organic Farming (RKVY) | 5 | 5 | NA | NA |
| Centre of Organic Farming (RKVY) | 2 | 2 | NA | NA |
| Centre of Organic Farming (RKVY) | 1 | 1 | NA | NA |

| | | | | |
|---|---|---|---|---|
| Centre of Organic Farming (RKVY) | Leveling of 23 ha. land at Derol, 150 ha. land at Chharodi and 20 ha. land at Kankanpur and farms lay out. | Leveling and plotting: 20 ha at Anand, 23 ha at Derol, Landscaping, leveling and plotting of 20.46 ha. land at Kankanpur, land leveling at Chharodi/ Sansoli | NA | Increased Seed Production in certified and labelled category, as per ure –I 2007-08 (pre- project year) to 2012-13 (post-project year) |
| Centre of Organic Farming (RKVY) | NA | Nandesari compound wall (850 m), Compound wall, (3-1170 m), Crimped wire netting, Forage Unit Wall,Approach road at RRS farm at Anand, Compound wall (798 m) at Kankanpur | NA | NA |
| **SEED** | | | | |
| Infrastructure Development for Quality Seed Production and Planting material at Research farms of AAU specially Sansoli, Derol, Kankanpur and Anand | NA | Electrification of '3' tube wells at Anand, '1' tube well at Kankanpur | NA | NA |
| Infrastructure Development for Quality Seed Production and Planting material at Research farms of AAU specially Sansoli, Derol, Kankanpur and Anand | NA | Pipe 1110 m. + Micro irrigation at Anand, Underground pipeline network at Derol, | NA | NA |

| | | | | |
|---|---|---|---|---|
| Infrastructure Development for Quality Seed Production and Planting material at Research farms of AAU specially Sansoli, Derol, Kankanpur and Anand | NA | 200 t Castor cake at Anand, 134 t Castor cake, 37.5 t vermi compost & micronutrients at Derol, 36.35 t Castor cake at Kankanpur, Soil enrichment at Sansoli | NA | NA |
| Infrastructure Development for Quality Seed Production and Planting material at Research farms of AAU specially Sansoli, Derol, Kankanpur and Anand | NA | Paddy Transplanter -1, Reaper –binder, Thresher etc. at Anand, 12 different equipments at Derol, '30' different equipments at Kankanpur, Tractor, Rotary tiller etc. at Sansoli | NA | NA |
| Infrastructure Development for Quality Seed Production and Planting material at Research farms of AAU specially Sansoli, Derol, Kankanpur and Anand | NA | Thresher, Reapers (2), Mobile Seed Processing Plant, (1 TPH – 1) & Seed storage bins at Anand, 8 different items at Derol, Thresher, fan and Gravity separator at Kankanpur | NA | NA |
| Infrastructure Development for Quality Seed Production and Planting material at Research farms of AAU specially Sansoli, Derol, Kankanpur and Anand | Strengthening of tissue culture facilities which include green house facilities, generator etc. | Green house hardening facility required for in vitro raised acclimatization of plantlets is successfully established. | Large scale multiplication of elite clones of date palm using tissue culture techniques. | Large number of *in vitro* date palm plants were produced and are currently maintained in poly house of the laboratory. |
| Infrastructure Development for Quality Seed Production and Planting material at Research farms of AAU | Development of clonal fidelity testing system for identification of | Real time PCR for carrying molecular identification of variants has been procurred. | Farmers will get assured sex of date palm which will ensure the farmers | High throughput molecular marker based clonal fidelity test has been |

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| specially Sansoli, Derol, Kankanpur and Anand | somaclonal variants | | for planting in field. | developed in date palm. |
| Infrastructure Development for Quality Seed Production and Planting material at Research farms of AAU specially Sansoli, Derol, Kankanpur and Anand | Large scale multiplication of date palm and jatropha | Mass multiplication of date palm has been successfully achieved. In vitro protocol for jatropha has been standardized. | Commercially viable *in vitro* protocol for date palm and jatropha. | An commercially viable protocol of date palm has been developed. However, *in vitro* contamination due to mucilage present in jatropha limits the development of complete protocol. |
| Strengthening of mass multiplication of Tissue culture in Date Palm and Jatropha | 27, nos computer set with accessories and modification of software application and getting internet connectivity. | 27, nos computer set with accessories and modification of software application and getting internet connectivity. | 27, nos computer set with accessories and modification of software application and getting internet connectivity. | 27, nos computer set with accessories and modification of software application and getting internet connectivity. |
| Strengthening of mass multiplication of Tissue culture in Date Palm and Jatropha | 1 nos Borewell, | 1 nos Borewell, | 1 nos Borewell, | 1 nos Borewell, |
| Strengthening of mass multiplication of Tissue culture in Date Palm and Jatropha | 61900 nos producer registered, 171095 hectare area covered and 793406 Qtls seed certified | 61900 nos producer registered, 171095 hectare area covered and 793406 Qtls seed certified | 61900 nos producer registered, 171095 hectare area covered and 793406 Qtls seed certified | 30038 nos producer registered, 179396 hectare area covered and 640978 Qtls seed certified |

Table 11: Output and Outcome (Arunachal Pradesh)

| | | | | |
|---|---|---|---|---|
| **Fisheries** | | | | |
| Development of portable FRP Hatchery to the private fish farmer | 3.51 ha | 14 ton | NA | NA |
| Development of Magur culture along with poly culture of carps | 12 nos. | 1 ton | NA | NA |
| Development of commercial fish farming | 100 ton | 60 ton | NA | NA |
| Development if pig cum fish culture | 1000000 seeds | 1 ton | NA | NA |

Table 11: Output and Outcome (Assam)

| | | | | |
|---|---|---|---|---|
| **Animal Husbandry** | | | | |
| Training institution | 1 training institution | 1 training institution | Not yet started | Not yet started |
| Seed | | | | |
| Seed processing centre & storage supporting tools, Outgani | Infrastructure development | Infrastructure development | To provide infrastructure support to the existing plants | 100 % achieved |
| Seed processing centre & storage supporting tools, Shillangan | Infrastructure strengthen | Infrastructure strengthen | To strengthen infrastructure support to the seed processing center & storage supporting tools | 100 % achieved |
| Seed processing centre & storage supporting tools, Lakhimpur | Infrastructure strengthen | Infrastructure strengthen | To provide support to the existing infrastructure | 100 % achieved |

Table 11: Output and Outcome (Meghalaya)

| | | | | |
|---|---|---|---|---|
| **Agriculture Mechanization** | | | | |
| Farm mechanization (WZH/RB/JH) | NA | 1030 ha | More area brought under cultivation | More area brought under cultivation |
| Integrated Pest Management (IPM) | | | | |
| Transfer of technology through farmers field schools- For increasing rice production in paddy clusters | NA | 187 (Nos.) | Training on IPM | Training on IPM |
| NRM | | | | |
| Irrigation Facility | NA | 4894 ha | Enhancing crop production and productivity | Enhancing crop production and productivity |
| Additional land reclamation & development | 1028 Ha | 1028 Ha | Prevent Soil erosion | Prevent Soil erosion |

Table 11: Output and Outcome (West Bengal)

| | | | | |
|---|---|---|---|---|
| **Animal Husbandry** | | | | |
| Setting up of veterinary polyclinic | Fair | Good | | |
| **Crop Development** | | | | |
| Saptial crop dynamics and yield gap across different farming system | | Yield gap identification in prevailing major crops (6 no's) & cropping system, Overall economic upliftment of farming folk in North Bengal region | Crop-wise yield gap identified: Wiinter rice: 5-8 %, Wheat: 8-16%, Mustard: 16-35%, Potato: 3-8%, Maize: 20-24% (Awareness among the farmers about gap in input use and output increased) | 4% reduction in yield gap across different farming sizes (Improvement in yield of major crops) |
| **Extension** | | | | |
| | Training of farmers and farm women 100 percent | Training of farmers and farm women 100 percent, 80% | Training of farmers and farm women 100 percent | Training of farmers and farm women 100 percent |
| **Fertilizer and INM** | | | | |
| Site specific nutrient management in lead cropping systems in | | Conduction of trainings | 8 trainings conducted over six districts | |

| | | | | |
|---|---|---|---|---|
| North Benagal districts | | | | |
| Site specific nutrient management in lead cropping systems in North Benagal districts | | 1 soil testing lab & documentation room | Almost completed | |
| Site specific nutrient management in lead cropping systems in North Benagal districts | | Estimation of initial nutrient status of the soils | Almost completed | |
| **Fisheries** | | | | |
| Block level soil and water testing lab cum training center | 255 ha of area was aimed to cover, farmers service | 5.5 ha, 22% covered | 1375 ponds, provide ext. service | 193 ponds, 15% completed |
| **Integrated pest management (IPM)** | | | | |
| On farm Plant protection advisory service | No. of trainees | 294 in 11-12 and 529 in 12-13 | i) Development of technical persuader<br>ii) Less health hazards<br>iii) Less women drudgery | Same as expected |
| Development and validation of IPM in rice, vegetable cropping system in northern region of West Bengal | Development of model plan like IPM in rice and Eco-friendly management | Model plan for IPM of rice developed very soon and Less pesticide hazard, quality product | Yield=54 q/ha with 50% less pest population (Sustainability in yield with quality product and less pests) | Yield of 49.69 q/ha & 36.84% less pest (Reduction of yield 4.31 q\ha & 13.76% less pest population) |
| Development and validation of IPM in rice, vegetable cropping system in northern region of West Bengal | Development of model plan like IPM in Cabbage and Eco-friendly management | Model plan for IPM of cabbage developed very soon and Less pesticide hazard, quality product (Sustainability in yield with quality product and less pests) | Yield=500 q/ha with 50% less pest population | Yield of 458 q/ha & 38.72% less pest (Reduction of yield 42 q\ha & 11.28% less pest population) |
| Development and validation of IPM in rice, vegetable cropping system in northern region of West Bengal | Development of model plan like IPM in cauliflower and Eco-friendly management | Model plan for IPM of Cauliflower developed very soon and Less pesticide hazard, quality product (Sustainability in yield with quality product and less pests) | Yield=500 q/ha with 50% less pest population | Yield of 433 q/ha & 39.66% less pest (Reduction of yield 67 q\ha & 10.34% less pest population) |

| | | | | |
|---|---|---|---|---|
| Development and validation of IPM in rice, vegetable cropping system in northern region of West Bengal | Development of model plan like IPM in tomato and Eco-friendly management | Model plan for IPM of tomato developed very soon and Less pesticide hazard, quality product (Sustainability in yield with quality product and less pests) | Yield=500 q/ha with 50% less pest population | Yield of 439 q/ha & 39.75% less pest (Reduction of yield 61 q\ha & 10.25% less pest population) |
| Marketing & Post Harvest management | | | | |
| Dhubguni regulated market | 26 stall | 26 no. stall , 95% | it will be done after inauguration | |
| Belacobar RMC | 50 Market shed & stall in no. | 50 shed and stall (100% completed) | 20 shops have been distribution (50% completed) | 20 shops distributed, 80% completed |
| Siliguri Regulated market- Construction | Road, Construction, Flower market shed, 20 Stall, Rice drain | | | |
| **NRM** | | | | |
| Promotion of conservation agriculture as a new enterprise for the sustainability of production system and resource conservation | 100 | 90 | i) Better access for field level equipments<br>ii) Quick detection of pests and diseases | Same as expected |
| **Organic farming/bio-fertilizer** | | | | |
| Search for natural pesticides compatible with IPM and Organic Farming from plant Biodiversity of Northern region of West Bengal | Search in 40 plants (Insecticidal, fungicidal efficacy study) | Search in 35 plants (Insecticidal efficacy found in 12 & fungicidal efficacy found in 3 plants) | | |
| **Sericulture** | | | | |
| Installation of walk in cold rooms at Govt. Grainages | 10 walk in cold rooms (Ideal environment for preservation of silkworm layings) | Nil | 10 walk in cold rooms, (Cost of production of silkworm layings is expected to be reduced by 30 % ) | Nil |

| | | | | |
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| Development of rearing facilities at Govt. farms | 5 silk worm rearing houses (Ideal rearing environment) | 5 silk worm rearing houses (Ideal rearing environment ) | 600 kgs. Cocoon /RH/annum, 40-50% bevoltine cocoons | 601 kgs. Cocoon /RH/annum (42% bevoltine cocoons) |
| Development of transportation facilities for silkworm seed cocoons and eggs | 4 refrigerated vans (Ideal environment during transportation) | Nil | 4 refrigerated vans (Reduction in pupal & embryonic mortality) | Nil |
| Construction of tasar grainage at Govt. farms | 3 tasar silkworm grainages (GR), Improvement in production of tasar silkworm eggs qualitative & quantitatively | 3 tasar silk worm grainages (GR), Ideal grainage environment | 80 kgs. Tasar silkworm eggs | 70 kgs. Tasar silkworm eggs |
| Erection of chain link fencing around Govt. farms | 19 Govt. farms (qualitative enhancement of mulberry foliage) | 12 Govt. farms (Increase in leaf yield by about 30%) | 19 \|Govt. Farms (Increase in leaf yield vis-à-vis seed cocoon production) | 12 Govt. farms (Increase in leaf yield vis-à-vis seed cocoon production in these farms) |
| Development of irrigation facilities at Govt. Farms | 10 Govt. farms (More succulent leaf with high nutrient content) | 10 Govt. farms (More succulent leaf with high nutrient content) | 60% enhancement in leaf production | 40-50% enhancement in leaf production (Mulberry foliage with high nutrient content ) |
| Matigara Sericulture complex- Fencing and Irrigation | Infrastructure, Benefit to the farmers | 100% (Fencing and irrigation works are completed) | 100%, Infrastructure and irrigation is materialised | Benefitted by farmers |

Table 11**: Output and Outcome (Nagaland)**

| **Project Name** | **Expected Output** | **Actual Output** | **Expected Outcome** | **Actual Outcome** |
|---|---|---|---|---|
| **Agriculture Mechanisation** | | | | |
| Farm Mechinaries | 30 no's | 8 no's | 270 hp | 67 hp |
| Farm mechanization | 450 hp | 300 hp | 2050 man days | 1350 man days |
| Farm mechanization | 270 hp | 270 hp | 1350 man days reduced | 1320 man days reduced |
| Agriculture tools, implements, power tillers, pump sets etc. | 3000 farmers benefits | 3000 farmers benefits | 6000 man days saved | 6000 man days saved |
| **Animal Husbandry** | | | | |
| Pigs & Poultry Production | 200 MT pork & 40MT chicken | 60 MT pork & 10MT chicken | 2.64 crore value | 0.66 crore value pork & 0.12 crore value chicken |
| Veterinary & animal Husbandry Livestock Production & Management | 300 crore meat value in the state. | 250 crore meat value in the state. | 0.12% increase in meat & milk prod. in the state. | 0.11% increase in meat & milk prod. in the state. |
| Livestock production & management | 35640 kg meat prod | 35040 kg meat prod | 42.7 lakhs additional household income | 42.8 lakhs additional household income |
| Livestock development | 15750 piglets | 15000 piglets | 3.1 crore value | 2.95 crore value |
| Fodder development | 8000 MT fodder | 8000 MT fodder | To increase milk & meat prod | 2% increase in prod |
| Animal health care | 11 vaccination campaign | 11 vaccination campaign | 11 vaccination campaign in 11 districts | 11 vaccination campaign in 11 districts |
| Convergence programme through PPP mode | 1300 animals | 1275 animals | 97200 kg meat | 94350 kg meat |
| Protein supplement (Sub-scheme) | 5000 germ plasm of piglets & 350 MT of additional meat production | 4010 germ plasm of piglets | Enhance protein supplement in the state | 450 tones meat production |
| Capacity building | 580 farmers trainings | 480 farmers trainings | 580 farmers training on animal rearing | 480 farmers training on animal rearing |

| | | | | |
|---|---|---|---|---|
| Animal health care | 11 vaccination campaign | 3200 animals treated | 11 vaccination capaign in 11 districts | Vaccination camp successfully conducted |
| Fodder development | 200 MT fodder | 200 MT fodder | To increase milk & meat production | Milk & meat production enhanced |
| Livestock development | 380 units | 281 units | Employment generation in the state | Self employment generation |
| **Crop Development** | | | | |
| Pulses Development Program | 500 ha | 126 ha | 400 MT | 100 MT |
| Oilseeds Development Program | 416 ha | 104 ha | 375 MT | 94 MT |
| Integrated development of major food crops | 14509 MT | 14500 MT | 94308 MT additional food grain | 94308 MT additional food grain an markets |
| Integrated dev. of major food crop | 8220 MT | 8200 MT | 5343 MT additional food grain | 5329 MT additional food grain an markets |
| Integrated dev of major food crops | 10800 MT additional food grain in the state | 10765 MT additional food grain in the state | 720 MT additional food grain by RKVY | 713 MT additional food grain by RKVY |
| Procurement of certified seeds (IDMFC) | 40800 MT additional food grain production | 38600 MT additional food grain production | 26520 MT additional food grain production by RKVY | 24928 MT additional food grain production by RKVY |
| Procurement of Truthfully labeled & quality seeds (IDMFC) | To procure 570 MT TLS | 555 MT | 380 ha to be covered | 376 ha covered |
| **Extension** | | | | |
| Strengthening of extension services | 140 farmers training | 140 farmers training | 7000 farmers | 6850 farmers |
| Strengthening of Extension Service | 160 farmers training | 158 farmers training | 8000 farmers trained | 7824 farmers trained |
| Strengthening of extension Services | 2000 farmers training | 2314 farmers training | Rural farmers to be trained through TRG & demo | 115% achieved |
| **Fertilizer and INM** | | | | |
| Fertilizer | 600 MT | 150 MT | 6000 ha treatment | 1500 under treatment |
| Manures and fertilizers | 50 MT | 45 MT | 5% increase in prod. | Increased prod. by 4% |

| | | | | |
|---|---|---|---|---|
| Manures & Fertilizers | 1100 ha under INM | 1075 ha under INM | 1100 farmers benefited | 1075 farmers benefited |
| **Fisheries** | | | | |
| Harnessing of untapped water bodies | 150 ponds | 37 ponds | 150 fish farmers | 37 fish farmers benefitted |
| Development of untapped water bodies | 11 dist | 8 dist | Conservation of endemic fishes | Value addition in fishery |
| Development of untapped water bodies | 136 ha | 136 ha | To enhance fish prod. in the state. | 3% increase in fish prod |
| Special scheme on land reforms for paddy-cum-fish culture | 10000 fingerlings | 10000 fingerlings | Additional income of 10.8 lakhs | 10 % additional income. |
| Reclamation of swampy & marshy area | 40 ha marshy land to be reclaim | 40 ha marshy land to be reclaim | To increase fish prod | To increase fish prod |
| Development of stream fisheries | 4 streams under endemic fish prod | 4 streams of 150 kms under endemic fish prod | Value addition in fishery | Value addition in fishery |
| Magur culture rearing | 3 units for magur prod | 3 units for magur prod | Increase magur prod. in the state. | Increase magur prod. in the state. |
| Farmers study tour | 280 farmers from 11 dists. on inter-state exposutre | 284 farmers from 11 dists. on inter-state exposutre | Increase farmers capacity building for fish prod | Increase farmers capacity building for fish prod |
| Magur culture rearing | 6 units of ponds for magur production | 5 units of ponds for magur production | 6 MT magur production in the state | Rearing of magur achieved in 4 districts |
| Development of stream fisheries | 5 streams in 5 districts | 4 streams of 150 kms in 4 districts | Value addition & fish conservation | Value additon due to ornamental fish conservation |
| Assistance for improvement of fish breed | 35 fishery ponds renovation | 26 fishery ponds renovation | Improvement of fish breeding pond | Improvement of fish breeding pond |
| Special scheme on land reforms for paddy-cum-fish culture | 24500 fingerlings | 20600 fingerlings | Additional income of 26.95 lakhs | 20.00 lakhs additional income |

| | | | | |
|---|---|---|---|---|
| **Horticulture** | | | | |
| Horticulture Development | 200 orchards | 50 Orchards | 200 farmers | 50 farmers |
| Integrated development of major horticulture crops | 50 storage & extraction units | 47 storage & extraction units | 50 storage & extraction units | 47 storage & extraction units |
| Development of medicinal and aromatic plants | 366 ha | 361 ha | 366 ha | 361 ha |
| Integrated development of major horticulture crops | 26 mushroom units | 24 mushroom units | 65 qtls additional mushroom prod | 60 qtls additional mushroom prod |
| Farm handling unit | 4 market. shed | 4 market. shed | Increase agril. marketing at block level | Rearing of magur achieved in 4 districts |
| Integrated development of horticulture crops | 52 orchards in 11 dists | 38 orchards in 11 dists | Increase in fruit prods. after 5 years | Value additon due to ornamental fish conservation |
| Mushroom production unit | 26 mushroom unit in 11 dists | 24 mushroom unit in 11 dists | Increase mushroom prod. in the state | 20.00 lakhs additional income |
| Vegetable cluster (Sub-scheme) | 87 vegetable clusters in 2 districts | 80 vegetable clusters in 2 districts | 1740 farmers in 2 districts | 1800 farmers in 2 districts |
| Area expansion of horticulture crops | 40 orchards in 11 districts (682 ha) | 286 orchards in 11 districts (484 ha) | To increase fruit production in the state | Anticipated increase in fruit production after 6 years |
| **Innovative Programmes** | | | | |
| Innovative Programmes | 200 ha | 50 ha | 350 farmers be benefited | 90 farmers benefited |
| **Integrated pest management (IPM)** | | | | |
| Bio-Control Lab | 13750 trichocards | 3400 trichocards | 1375 ha to be treated under bio-control | 400 ha treated |
| Integrated pest management (IPM) | 4000 ha | 4000 ha | Reduce cost of prod. | Increase prods. by 4% |
| Integrated pest management | 2000 ha | 2000 ha | 1500 IPM farmers | 1500 IPM farmers |
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| **Marketing & Post Harvest management** | | | | |
| Agril.Marketing | 20 nos | nos | To improve rural marketing | Increase flow of Agril. produce to urban markets |
| Market development and post harvest management | 25 marketing shed | 25 marketing shed | Increase flow of Agril. produce to urban market | Increase by 6% |
| Market dev & PH mngt | 15 marketing shed | 15 marketing shed | Increase flow of Agril. produce to urban market | Increase flow of Agril. produce to urban market |
| Market dev.&post harvest management | 40 marketing shed/355 equipments | 25 marketing shed/324 equipments | To benefit 40 villages | 25 villages benefited |
| Market dev.&post harvest management | 30 market shed & godown | 30 market shed & godown | To improve storage & processing | Improvement of fish breeding pond |
| Market shed & storage | 50 marketing shed/ 1011 equipments | 42 marketing shed/ 892 equipments | To increase flow of agriculture produce to urban markets | Increased flow of produce to urban markets |
| Post harvest management | 50 nos. of market shed in 11 districts | 50 nos. of market shed in 11 districts | To increase in rural agricultural marketing | Rural agricutlural marketing improved |
| **Minor/micro irrigation** | | | | |
| Farm water management | 700 ha under micro irrigation | 522 ha under micro irrigation | Productivity increase with assured irrigation | 5% increase in food grain prod |
| **Non Farm Activities** | | | | |
| Soil Testing Lab | 20000 samples be tested | 5000 samples testing | 20000 samples be tested | 5000 samples tested |
| Construction of training hall at IETC, Medziphema | 1 training hall | 1 training hall | 80 persons capacity | Site leveling done |
| Basic activities | survey & investigation of 11 projects | 3200 man days | Timely completion of project works | Timely completion of project works |

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| Power tiller path | 150 power tillers enable to work in the field | 150 power tillers enable to work in the field | 1250 man days saved | 750 man days saved |
| **NRM** | | | | |
| Water harvesting for multiple crop production | 520 WHS | 130 WHS | 520 farmers | 130 farmers benefitted |
| Land development & farm water management | 60 ha irrigation | 60 ha irrigation | 5% increase in prod. | Increase prods. by 4% |
| Water harvesting for multiple crop production | 400 WHS | 365 WHS | 240 farmers | 228 farmers |
| Land Dev & Farm water management | 175 ha developed | 175 ha developed | 0.06% increase in crop area | 0.06% increase in crop area |
| Water harvesting for multiple crop prod | 380 WHS | 380 WHS | To increase crop area | 3% crop area increase |
| Water harvesting pond for multiple crop prod | 200 units of WHP | 198 units of WHP | To increase double cropping | 4% increase in double cropping during the year |
| Farm water management | 1900 ha | 1786 ha | To enhance productivity | To enhance productivity |
| Water harvesting ponds | 220 units of WHP | 180 Units of WHP in 11 districts | To increase double cropping | Increase in double cropping during the year |
| Dry terracing | 420 ha | 360 ha | 420 ha under crop production | 360 ha under crop production |
| **Organic farming/bio-fertilizer** | | | | |
| Organic cluster project | 120 ha under organic farming | 80 ha under organic farming | 360 MT organic food prod. | 240 MT organic food prod |
| Production of bio-fertilizers | 20 MT bio-fertilizers | 18 MT bio-fertilizers | 770 ha under bio-fertilizer treatment | 768 ha covered under bio-fertilizer treatment |
| Organic cluster project | To enhance organic food prod. | To enhance organic food prod. | 5000 MT organic food prods. In the state | 3820 MT organic food prods. In the state |

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| Production of Bio-fertilizers | 50 MT bio-fertilizers | 48 MT bio-fertilizers | 2000 ha under bio-fertilizer treatment | 1920 ha area treated by bio-fertilizers |
| **Research** | | | | |
| Research & Dev. (Agri.) | 100 variety trails | 25 Variety trails | 100 variety trails | 25 Variety trails |
| **Seed** | | | | |
| State Seed Farm | 500 MT Seed | 125 MT Seeds | 10000 ha | 2500 ha |
| **Sericulture** | | | | |
| Rearing and food plantation for eri and muga | 250 ha | 200 ha | Increase in eri and muga prod | 12% increase in eri and muga prod. |

**Table 11: Output and Outcome (Orissa)**

| **Projects** | **EXPECTED OUTPUT** | **ACTUAL OUTPUT** | **EXPECTED OUTCOME** | **ACTUAL OUTCOME** |
|---|---|---|---|---|
| **Agricultural Mechanization** | | | | |
| Installation of Travis | 1024 travies were to be insalled a different institutions | Installed | Smooth execution of veterinary health care as well as breeding programme | Facilitate safe vaccination, treatement and artificial imsemination of animal. |
| Strengthening of Livestock Breeding Farm (Chiplima & Keonjhar) | Renovation of both Chiplima and Keonjhar farm | Renovation work of 7 no's of cow shed along with 1 calf pen at ECB, chipilima completed, b) Boundary wall measuring 362 ft has been constructed at ECB, Chipilima, c) Boundary wall measuring 4000 ft at LBD farm, Keonjhar has been constructed. Bore well with RCC | The crossbreed calves so produced will be utilised for breeding purpose towards augmenting the livestock resources of the state, b) The production capacity of the farms concerned will be increased | The infrastructure so created in 2 livestock breeding farm facilitating maintenance and induction of high pedigree dairy animals |

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| | | over head tank have been constructed at ECB Chilpilima, b) Equipment required for maintaining additional dairy animal in these 2 farms has been provided. | | |
| Strengthening of frozen semen bank, Cuttack | Establishment of an andrological lab. For production of high quality semen at FSB, Cuttack | Andrological lab. Has been established at FSB, Cuttack, b) Equipments like CASA has been supplied for carrying out analysis of semen quality | To assure production and propagation of improved variety of progenies | Establishment of Andrological lab. Ensures production of quality frozen semen through different lab test, b) Creation of infrastructure towards more storage facilities for frozen semen |
| Supply of Travis | 1024 trevies were to be supplied to different field institutions. | 1024 nos. of travis have been procured and supplied to the field level Veterinary Institutions. | Smooth execution of Veterinary Health Care as well as breeding services. | Helped in facilitation safe vaccination, treatement and artificial insemination of animal at field institutions. |
| Improvement of poultry farms & establishment of hatcheries | To make available of inputs like day old chicks of improved variety at an affordable price for wfich the rural livestock owners got an alternative livelihood means. | Expansion of 16 nos. of poultry hatchery buildings constructed under SGSY, b) Constructing of 11 nos. training hall with dormitory at the site of SGSY poultry hatcheries, c) Construction of 4 nos. of layer house and one brooder house in each of the 8 nos. of State | Day old chicks with increased production potentiality under low input technology will be supplied to the farmers. | Accessibility of farmers for acquiring skill on profitable backyard poultry farming. |

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| | | Govt. owned poultry breeding farm. | | |
| Development of Chipilima Farm | Maintainance of parent stock-2000, b) Production of Hatching Eggs-2.5 lakhs, c) 15000 rural farm families will be benefited. | 2000 Banaraja parent stocks were maintained, b) 200000 fertile eggs were produced, c) 15000 rural farmers were benefited. | Day old chicks with increased production potentiality under low input technology will be supplied to the farmers. | Renovation of layer house with plinth area of 4000 sft. To accommodate the newly inducted 2000 layer parent stock along with provision of feed, equipments and medicine etc. boundry wall of 600 ft. with gate constructed for ensuring bio-security. |
| Setting up of 26 District Diagnostic Laboratories & Strengthening of 4 Regional Disease Investigation Laboratories | To make available of disease diagnostic facility at field level ensuring reduction of martality leading to increase in productivity. | Construction work of 26 nos. of DDls & renovation work of 4 nos. of RDIL have been completed. Equipments for quick & easy diagnosis of various communicable disease have been provided. | It will continue to benefit immensly to the livestock farmers at the time of need for treating & saving their livestock and poultry from various contagious diseases. | The project has rendered easy and quick diagnstic facilities for communicable diseases of economic importance relating to livestock & poultry through setting up of DDLs in 26 districts and strengthening of four regional disease investigation lab in four regions of the state. |
| **Crop Development** | | | | |

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| Establishment of Gene Bank | Collection and conservation of Genetic Resource of different crops | 909 nos. of germplasm of different land races of different crops have been collected and preserved, 50 varieties have been registered under PPV and FRA. | Varietal improvement of crops resulting food security. | Some varieties have shown disease and resistence and high yield potentiality under water log and drought condition. |
| Livelihood improvement of tribal through production & value addition of tuber crops, pineapple and organic spices | 3000 bottles/ year of mushroom spawn/unit | 1500 to 5000 bottles/year/unit | To increase mushroom production in the district | mushroom production increased by 10-30% in the districts |
| **Dairy development** | | | | |
| 3000 ltr capacity Ice cream plant at Bhubaneswar Dairy in Khurda District | Plant Mechinary | Plant Mechinary | Plant Mechinary | Plant Mechinary |
| **Extension** | | | | |
| Infrastructure Development of Krishi Vigyan Kendras | 50,000 seedlings, saplings & quality planting materials /year/poly house, b) 3000 bottles/year of mushroom spawn/unit, c) 10 kg. vermi culture & 1 ton of vermi compost/year/unit, d) 1500 day-old chicks to be rearedfor 1 month/year/poultry unit, | a) 25000 to 1 lakh saplings/year/poly house, b) 1500 to 5000 bottles/mushroom spawn/year/unit, c) 5 to 20 kg vermi culture & 0.5 to 1.0 T vermi compost/year/unit, c) 500 to 3000 day old chicks/year/unit, e) 2 to 3 ha land irrigated/borewell, f)6 | a) 5 ha area in the district will be covered/unit, b) to increase mushroom production I the district, c) Act as Demo-cum skill oriented Trg. Unit for the ditrict, d) Cater to the need of Backyard poultry farming with good breeds, e) to increase production by 50%, f) Entire seed of nearby KVKs will be | e) 25-30%, i) 50%, j) 100% |

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| | e) 5.0 ha land to be irrigated/ bore well, f) processing 10.0 ton seed/plant/year, g) Threshing entire Farm Produce, h) Produce 10,000 fish fingerlings/year/unit, i) Rear 10 Sirohi or Black bengal kids/goatery unit, j) 4 cross bred milch cows to be reared in dairy unit at KVK, Sambalpur. | to 15 seed/plant/year, g) Threshing entire Farm Produce, h) 5000 to 7000 fingerlings/year, i) 4 kids reared in the a unit of KVK, Jagatsinghpur | processed, g) Timely procesing of produce, h) 10 beneficieries per unit will get quality fingerlings, i) Act as Demo-cum skill oriented trg. unit and cross-breeding centre to up-grade local goat, j) Act as demo-cum skill oriented trg unit | |
| Training on capacity building and exposure visit | Officers and farmers to acquire new technology on paddy and groundnut seed production | Broadened the outlook of farmers with sharing of experience & growth in farm mechanisation | To gather latest knowledge on various advance methodology in groundnut & paddy seed production including optimisation of available resources. | Sharing of ideas and knowledge and adoption of farm mechanisation in groundnut crop by some of the seed growers of Puri, Kalahandi, Khordha, Mayurbhanj & Nuapada District. |
| Establishment of Farm Information Advisory Centres (FIAC) | Construction of 100 FIAC building at block level. | 100 FIAC building was constructed ofat block level. | Increased in production and productivity of crops. | a)Production and productivity of crops increased. |

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| Training on capacity building and exposure visit | Officers and farmers to acquire new technology on paddy and groundnut seed production. | Broadened the outlook of farmers with sharing of experience & growth in farm mechanisation. | To gather latest knowledge on various advance methodology in groundnut & paddy seed production including optimisation of available resources. | a) Sharing of ideas & knowedge and adoption of farm mechanisation in groundnut crop by some of the seed growers of Puri, Kalahandi, Khordha, Mayurbhanj & Nuapada Dist. |
| Infrastructure development work of krishi vigyan kendras | 50000, seedlings, saplings & quality planting materials /year/ polyhouse | 25000 to 1.0 lakh/year/ poly house | 6 ha. Area in the district will be covered/unit | |
| FIAC | 10 kg. vermi culture & 1.0 T of vermi compost/year/unit | 5 to 20 kg. vermi culture & 0.5 to 1.0 T vermi compost/year/unit | Act as demo -cum-skill oriented trg. Unit for the district | |
| **Fertilizer and INM** | | | | |
| Establishment of 10 new soil testing laboratories | Infrastructure fo establishment of Soil Testing Laboratory | 10 Soil Testing Lab. Was established | Increase in annual soil testing capacity by 100000 nos. Balance dose of fertiliser application will increase production and productivity, Restoration of Soil Health | Annual soil testing capacity has been increased by 1,00,000 nos. |
| **Fisheries** | | | | |

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| Modernisation of Chandrabhaga Shrimp Hatchery at Konark, Puri | Production of 25 million capacity of L. Vannamei seeds. | The Krishna Hatchery was produced 37.75 million of *L Vannamei* naupli and sold only 10 million PL-10 seed to Brackish water fish farmers of Astharang, Konark, Baleswar, Brahmagiri, Andhra Pradesh and west Bengal Areas. | Diseased free prawn *L. Vannamei* | Ensure supply of disease free prawn L. Vannamei seed to BW farmers. Revive the prawn processing & export industry of the state. |
| Development of Fishery Training Institute, Balungaon | Skill upgradation of the unemployed youth of the state, fisheries will encourage them to adopt pisci culture for income generation and increase fish production of our in coming years. | Programmes has been made for training & skill up gradation of 600 nos. lead fish farmers at FTI, Baslugaon. | Earlier the capacity was 30 nos. per batch but after getting assistance from RKVY another hostel building with infrastrucure has been created with increasing capacity of 60 nos. per batch. | Through this training large numbrer of unemployed youth are being trained and motivated to adopt scientific pisciculture practices as a lucrative livelihood. |
| Improvement of State Brackish Water Training Centre, Paradeep | Export of prawn/fish will be increased which will turn generate additional foreign exchange for economic improvement of the state. | Programme has been made for training & skill upgradation of 500 nos. lead fish farmers at BWTC, Paradeep | Earlier the building was in damaged condition. After getting assistance from RKVY the building has been improved and 500 nos. of farmers have been trained. | It will help the fish farmers of the state to adopt scientific culture practices through both horizantal and vertical expansion of Brackish Water aquaculture. |

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| Modernisation and Development of Government Fish Farm | The short fall of fingerlings in the state can be overcom. The fish farmers of the state will avail the opportunity to stock fingerlings in their tank to enhance fish production. | The shortfall of fingerlings in the state can overcome and another 23 ha additional water area is created. The fish fish farmers of the state will avail the opportunity to stock fingerlings in their tank to enhance fish production. | Tanks are being used for production of additional fish seed of Indian Major Carps. Some tanks are being used for conservation riverine fish species like Jayanti Rohu and IMC species. | 40 millions of fingerlings valued rs. 50.00 lakh in each year will be produced which will add substantial increase in fish production of the state. |
| **Horticulture** | | | | |
| Development of Deras Horticulture Farm | 500 feet by 400 feet water body | Unutilized barren land used for formation of big water body over 9 acre and storage of water over an area of 6.5 acre with 6-7 feet deep water. | Expected to irrigate the local farm area of about 80 acre. This will improve the farm revolving fund. Also pisci culture could be encouraged in coming future. | Irrigated the local farm area of about 80 acre. Eco tourism has been developed & improved the farm revolving fund. Also pisciculture encouraged climatic change achieved. Employment created. |
| Establishment of FIT Centre | Quality training to farmers on hi-tech cultivation and information about horticulture marketing | Created 1 nos. of FIT centre with store room, faculty chamber, conference hall, computer room, borewell with pumpset, books, periodicals etc. | Quality information technology Centre. | By use of this centre farmers are benefitted regarding hi-tech cultivation and proper marketing to get more remuneration. |

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| Additional requirement for horticulture Training Institute, Kandhamal | 100 seated boys hostel, c) 50 seated girls hostel, Training institute-cum-administrative building, d) C- type, D- type & E-type quarters | a) Training, b) Accommodation, c) Accommodation & d) Accommodation of staff | Increasing production and productivity of the crops. | Increasing production and productivity of crops. |
| Establishment of Model nursery in non-NHM District | Quality planting material production. | a) More nos. of QPM produced, b) Use of polyhouse and shednet house increased the quality of the planting material and reduced irrigation | Farm will become more profitable | Profitability achieved. |
| Establishment of Model nursery in non-NHM District (Mahavinayak Farm) | Training to 300 farmers | a) The production of quality planting material has been 100000. b) 300 farmers trained | Increased profitability of the farm. | The revenue of the farm has increased. |
| Development of Establishment of Model nursery in non-NHM District (Boudh Farm) | Training to 500 farmers | a) The production of quality planting material has been 100000. b) 500 farmers trained | Increased profitability of the farm. | The revenue of the farm has increased. |
| **Research** | | | | |
| Strengthen of Research Stations at OUAT | NA | NA | NA | NA |
| Strengthening of research stations at OUAT | 5.0 ha. Land to be irrigated/ Bore well | 2.0 to 3.0 ha. Land irrigated/bore well | To increase the production by 50% | Production increased by 15 to 30% |

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| Infrastructure development of four research units of OUAT | Processing 10.0 T seed/plant/year | 6.0T - 15T seed/plant/year | Entire seed of nearby KVKs will be processed | Nearby KVK's are processing their seeds in the plant |
| Research projects (8 no.s) | | | Timely processing of produce | Timely processing of produce |
| Infrastructure development of RRTTS, Bhawanipatna, Kalahandi | Produce 10,000 fish fingerlings/year/unit | 5000 to 7000 fingerlings/year | 10 beneficiaries per unit will get quality fingerling | 10 to 20 beneficiaries/unit |
| Infrastructure development of RRTTS, Chipilima, Sambalpur | Rear 10 Sirohi or black bengal kids/ Gotery unit | 4 kids reared in the unit at KVK, Jagatsinghpur | | 364 farmers have been benefitted by the unit so far in upgrading their goat |
| Infrastructure development of RRTTS, Ranital, Bhadrak | 4 Cross breed milch cows to be reared in dairy unit at KVK, Sambalpur | Nil | Act as demo -cum- skill oriented trg. Unit | |
| Infrastructure development of RRTTS, Jeypore, Koraput | Yam- 1000 household (HH) | 3800 HH | 25.0 MT/ha against present level of 10 MT/ha | 13.40 MT/ha average. Highest being 16.48 MT/ha |
| Infrastructure development of RRTTS, Kendrapara | Elephant foot yam - 1000 HH | 1000 HH | 30 MT/ha against present level of 15 MT/ha | 22.90 MT/ha average. Highest being 29.5 MT/ha |
| Infrastructure development of RRTTS, Umerkote, Nabarangapur | Cassava - 1000 HH | 1000 HH | 30 MT/ha against present level of 10 MT/ha | 12.00 MT/ha |
| Infrastructure development of RRTTS, Nayagarh | Pineapple - 1200 HH | 777 HH | 40.00 MT/ha against present level of 10 MT/ha | 15.00 MT/ha |
| Infrastructure development of RRTTS, Phulbani | Ginger - 1500 HH | 4500 HH | 15.00 MT/ha (fresh) | 9.7 MT/ha (fresh) average. Highest being 10.7 MT/ha |

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| DNA finger printing of OUAT released varieties, local land races, farmers varieties of different crops (Mr. K.C. Samal) | Turmeric - 1500 HH | 1200 HH | 20.00 MT/ha (fresh) | |
| Study on adoption of HYV of rice and its constraints in Orissa | **Total - 7200 HH** | **11477 HH** | | |
| Development and promotiona of eco-friendly system for management of major insect pest of field and vegetable crops (Dr. H.P. Patnaik) | Farmer's training - 932 farmers | 1172 farmers trained | Not assessed | |
| Production & popularization of bio-control agents in various crop ecosystems of Orissa (Dr. B.K.Mishra) | Construction of 100 FIAC building at block level | 100 FIAC building was constructed at block level | Increase in production & productivity of crop | Production & productivity of crop increased |
| Genetic enhancement of indigenous aromatic rices for higher productivity (dr. D.N. Bastia) | Quality seed production | 57 departmental farms have been strengthened for quality seed production (29199 qtl. of paddy & non paddy seeds were produced during 2009-10 and 22206 during 2010-11) and Sakhigopal farm has been renovated as a "Model farm" | Saving of labour & time by use of farm machineries hiring of machineries during lean period which will take care the maintenance cost of machineries | By use of improved farm machineries and electrification in the farm, agricultural operations became easier. As a result, saving of hectare labour cost as well as timely agril. Operations become possible. |
| Development of quality protein Maize (Mr. D. Lenka) | Training and capacity building | Training and capacity building | Training of students and farmers | Training of students and farmers |

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| Protection of plant varieties and geographical indication of the State | Efficient post harvest operations & storage | Efficient post harvest operations & storage | Godowns, threshing floor to be constructed | Godowns, threshing floor constructed |
| Developing transgenic mung bean for cold tolerance | Agril. Research augmented | Agril. Research augmented | Channel, T.Ws, land levelled, FSR pond, road boundary etc. to be done | Channel, T.Ws, land levelled, FSR pond, road boundary etc. constructed |
| Development of integreted farming system model for small and marginal farmers of western and coastal Orissa | Training and capacity building | Training of farmers conducted | Training hall to be furnished | Training hall furnished |
| Development of suitable technology for maintainance and enhancement of seed quality of some important field crops under coastal warm humid climate | Strengthening of labs | labs strengthened | Research labs to be renovated | Research labs renovated |
| E-connectivity to research stations of OUAT | Efficient post harvest operations & storage | Efficient post harvest operations & storage | Stores, godowns, threshing floor to be constructed | Stores, godowns, threshing floor constructed |
| Farming participatory research | Agril. Research augmented | Agril. Research augmented | Land leveling, channel, B.W. road, boundary, pond, tissue culture, sprinkler, drain etc. to be done | Land leveling, channel, B.W. road, boundary, pond, tissue culture, sprinkler, drain etc. constructed |
| **Seed** | | | | |

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| STL cum SCO office Sambalpur | To undertake testing of seed samples to a tune of 5000 nos. (Minimum) per year | The area under seed certification during Kharif & Rabi has increased substantially during last years | To make available certified quality seeds to the farmers of adjourning districts of Odisha | The seed testing work will take full shape and size after deployment of manpower in STL. |
| STL Bhawanipatna | to test minimum 5000 nos. of sample in a year | To be assessed after the STL become functional | To provide quality certified seeds to the farmers of adjourning districts of Odisha | The seed testing work will take full shape and size after deployment of manpower in STL. |
| Estt. of seed certification offices (4 no) Baripada, Berhampur, Bolangir & Jeypore | to make available certified quality seed Certification offices | They are under seed certification during kharif and rabi has increased substantially | To bring awareness among the seed growers for seed quality assurance to maximize production and productivity with positive economy | More and more seed growers have shown interest for seed production through seed certification |
| Renovation agriculture farms | Quality Seed Production. | a) 57 departmental farms have been strenghthen for quality seed production (29199 qtl. Of paddy & non-paddy seeds were produced during 2009-10 and 22206 qtl. During 2010-11) and sakhigopal farm has been renovated as "Model Farm" | Saving of labour and time by use of farm machinaries , hiring of machinaries during lean period which will take care the maintenence cost of machinaries. | By use of improved farm machineries and electrification in the farm, agriculture operations become easier. As a result, saving of per ha labour cost as well as timely agricultural operation become possible. |

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| STL-cum-SCO office Sambalpur | To undertake testing of seed samples to a tune of 5000 nos. (Minimum) per year. | a) The area under seed certification during Kharif & Rabi has increased substantially during last three years. | To make available certified quality seeds to the farmers of adjourning districts of Odisha. | The seed testing work will take full shape and size after deployment of manpower in STL. |
| STL Bhawanipatna | To test minimum 5000 nos. of sample in a year. | a) To be assessed after the STL becomes functional. | To provide quality certified seeds to the farmers of adjourning districts of Odisha. | The seed testing work will take full shape and size after deployment of manpower in STL. |
| Estt. of seed certification offices at Baripada, Berhampur, Bolangir &Jeypore | To make available certified quality seed to the farmers of the state. | a) The area under seed certification during Kharif & Rabi has increased substantially. | To bring awareness among the seed growers for seed quality assurance to maximize production and productivity with positive economy. | More and more seed growers have shown interest for seed production through certification. |
| Renovation of Agril. Farms | 1500 day-old chicks to be reared for 1 month/year/poultry unit | 501 to 3000/year/unit | cater to the need of backyard poultry farming with good breeds | Backyard poultry rearing with banaraja breed has become successful |