

EXECUTIVE SUMMARY

1.1 Introduction

India is the second largest producer of fruits and vegetables in the world after China. Till 1980, the main focus of the country was on cereals' production. During 1980-92, efforts began for consolidation of institutional support and planned process for the development of horticultural sector. In post 1993 period, focused attention was given on horticulture development by increasing plan allocations. Despite that the yield of the horticultural crops increased marginally during 1991-92 to 2006-07. It rose from 7.5 MT/ha in 1990-91 to 11.00 MT/ha in 2010-11. In fact the horticulture sector is facing severe constraints like low crop productivity, limited irrigation facilities and underdeveloped infrastructure support. With a view to promote holistic growth of horticulture sector, the Department of Agriculture & Co-operation, Ministry of Agriculture, Government of India has launched a centrally sponsored scheme of "National Horticulture Mission" (NHM) in April 2005 in all the states and union territories except north-eastern states. The main objective of the NHM is to promote area based regionally differentiated cluster approach for development of horticultural crops having comparative advantage. Since then the scheme is in operation, so it would be necessary to analyze its impact. It is therefore, the Ministry of Agriculture, Government of India assigned to its Agro-Economic Research Centres/Units to carryout crop based impact evaluation study across the states. Accordingly, Agro-Economic Research Centre for Bihar & Jharkhand, T M Bhagalpur University has undertaken this study in Bihar.

Bihar, endowed with very fertile land and sub-tropical climate, holds a vast potential for growing a large variety of horticultural crops. Fruits and vegetables crops cover about 1.11 million hectare (2008-09) accounting for 19.73 per cent of the net sown area and 14.39 per cent of gross cropped area of the state. The state ranks 4th in fruit and 3rd in vegetable production in the country. The state contributes nearly 7.00 per cent of the country's total fruit production (62.85 MT in 2007-08). Mango is the most important crop with the largest acreage (49.56%) and production (35.72%). The yield

rate of mango is 9.23 MT/ha, lower than the national average of 11.93 MT/ha. As regards the litchi, about 2/3 of its total production is produced in the state. Guava, banana (2nd most important crop), citrus fruits (lime, lemon and pummelo), pineapple, coconut, papaya, jackfruit, custard apple, aonla, bael, ber, pomegranate, peach, sapota, jamun, karonda, mulberry, khirni, amra, etc are also grown in the state. Besides the state has also a long tradition of growing large number of vegetables due to diversified agro-ecological situations. The total area under vegetable production is about 827 thousand hectare with annual production of 13386 MT. The average productivity is 16.19 MT/ha. Root and tuber crops are the third most important food crop after cereals and legumes. The total area under spice crops is about 10.80 thousand hectare with annual production of about 57 thousand MT. The state is not producing enough flowers to meet its domestic requirements. The area under cultivation of flowers is very limited. Due to government support and some other initiative, the area under floriculture in the state has now gone up to 593 hectare. As regards the medicinal and aromatic plants, the exact area is not known but its plantation is becoming popular amongst the farmers and the area under these crops is gradually increasing. Among the plantation crops coconut has expanded to about 15000 hectare. Tea plantation has also come up in Kishanganj and its adjoining areas.

1.2 Objectives of the Study

The study has following objectives:

- i. Assess the impact in terms of increase in area, production and productivity of identified horticultural crops covered under NHM, keeping 2004-05 as the base year in the state in general and for the identified crops/districts in particular.*
- ii. Extent to which the scheme has helped in creating employment opportunities and enhancement of income of the farmers, and;*
- iii. Suggest measures in improving the implementation strategy.*

1.3 Data base and Methodology

This study has been undertaken in Bihar. It is based on intensive sample survey. The main reliance is on primary data. To obtain primary data, first of all, on the advice of the Ministry of Agriculture, Government of India, 2 districts have been selected. These are Muzaffarpur and Vaishali. From each selected district, 2 villages

have been selected one on the basis of near the periphery of district headquarters and another from a district place so as to realize the effect of distance factor. Lohsarai (Bochhan block) and Amnor (Oraie block) villages in Muzaffarpur district and Satpura (Bhagwanpur block) and Katarmala (Gouraul block) villages in Vaishali district have been selected. To select the bottom unit of the sample, lists of the beneficiaries under the programme, mainly the area expansion scheme of the sample villages, have been obtained from the concerned DHO offices. Thereafter, the beneficiaries have been classified in different categories of farms and social sections, so that outreach of the scheme could be reflected in the study. Two villages from each of the selected districts and 25 beneficiaries from each of the selected villages, taken together 100 beneficiaries' households form the size of the sample. Mango and litchi crops have been covered for the purpose of the study. The reference periods of the study are 2004-05 (pre-project) and 2005-06 to 2008-09 (implementation of the programme).

1.4 Area, Production and Productivity of Horticultural Crops in the State

The state has 9359.57 thousand hectares of geographical area and out of it 71.08 per cent is cultivable. It has 11.78 per cent horticultural area to the cultivable area. Analysis reveals that both fruits and vegetables signify a steady growth in terms of increase area and production from 1990-91 to 2009-10. The production of fruits grew by 1.4 times, whereas that of vegetables by 1.69 times during the same period. During 2000-01 to 2009-10, area under fruits grew by 1.09 times while vegetables by 1.46 times and species by 44 per cent. During the same period, the area and production of commercial flowers increased by 4 times and 6 times respectively. Growth analysis reveals that fruits' area and yield grew by 8.82 per cent and 24.95 per cent during 2000-01 to 2009-10. Growth rates for fruits area and vegetables indicate 1.72 per cent and 31.80 per cent respectively during the period of 2004-05 to 2009-10. Similarly for vegetables sub-sector 46.19 per cent and 24.71 per cent respectively during the period of 2000-01 to 2009-10, while these are 71.05 per cent and 12.11 per cent for the period of 2004-05 to 2009-10. Growth in area and yield of species and flowers sub-sector recorded 43.96 per cent & 14.56 per cent and 389.36 per cent & 20.77 per cent respectively for the period of 2004-05 to 2009-10. The

district wise growth analysis of horticultural crops for TE 2004-05 to TE 2008-09 reveals that the area and yield of fruits sub-sector has recorded fall in area by 0.04 per cent and increase in yield rate by 6.93 per cent, 16.84 per cent and 1.21 per cent respectively for vegetables sub-sector, 10.58 per cent and 3.50 per cent respectively for total (fruits + vegetables) and 52.75 per cent and (-) 4.10 per cent respectively for floriculture sub-sector at aggregate levels. The growth of area and yield of mango crop have been recorded at 0.842 per cent and 5.017 per cent respectively during the period of 2004-05 to 2009-10. Similarly in case of litchi crop, it has been recorded at 1.549 per cent and 0.995 per cent respectively during the same period. The average annual growth in terms of area and yield of mango crop has been found 0.715 per cent and 12.34 per cent respectively during 2004-05 to 2008-09 whereas that of 1.847 per cent and (-) 0.35 per cent respectively in case of litchi crop during the same period. The preceding analysis clearly reveals that NHM programme has made tremendous success in increasing area of mango and litchi crops. In case of yield rate the average annual growth of mango was recorded at 12.34 per cent but it fell by 0.35 in litchi crop at the aggregate levels.

Table No. 1.1: Growth in Area and Yield of Horticultural Crops (In %)

Year	Fruits		Vegetables		Spices, Garden & Plantation		Commercial Flowers		Medicinal & Aromatic	
	A	Y	A	Y	A	Y	A	Y	A	Y
1990-91 to 2000-01	1.87	0.95	- 31.44	- 20.55	0.00	0.00	0.00	0.00	0.00	0.00
2000-01 to 2009-10	8.82	24.95	46.19	24.71	0.00	0.00	0.00	0.00	0.00	0.00
2000-01 to 2004-05	6.99	- 5.20	- 14.53	11.24	0.00	0.00	0.00	0.00	0.00	0.00
2004-05 to 2005-06	0.00	9.37	0.81	- 0.45	13.19	2.91	34.04	56.03	0.00	0.00
2004-05 to 2006-07	- 4.12	22.43	66.80	6.93	20.88	7.67	2006.38	-85.77	0.00	0.00
2004-05 to 2007-08	-74.91	-0.20	66.80	10.56	34.07	12.62	33275.89	-98.72	0.00	0.00
2004-05 to 2008-09	-0.34	28.02	67.41	4.86	39.56	13.59	318.44	32.44	0.00	0.00
2004-05 to 2009-10	1.72	31.80	71.05	12.11	43.96	14.56	389.36	20.77	0.00	0.00

Table No. 1.2: Growth rate in Area and Yield Rate of selected Horticultural Crops in Bihar (In %)

Year	Crop - I (Mango)		Crop - 2 (Litchi)	
	Area	Yield	Area	Yield
1990-91 to 2000-01	NA	NA	NA	NA
2000-01 to 2008-09	0.351	0.610	9.82	-8.60
2000-01 to 2004-05**	(-) 0.352	0.973	7.420	(-) 3.413
2004-05 to 2005-06**	0.071	41.301	0.000	(-) 2.342
2004-05 to 2006-07**	0.249	25.490	0.528	1.708
2004-05 to 2007-08**	0.499	0.181	1.643	2.977
2004-05 to 2008-09**	0.714	13.410	1.848	1.464
2004-05 to 2009-10**	0.842	5.017	1.549	0.995

** Growth rates are based on annual averages.

1.5 Household Characteristics, Cropping Pattern and Production Structure

This chapter is dealt on household characteristics, cropping pattern and production structure of the sample respondents. The sample size is 100 farm households constituting 17.00 per cent by marginal farms, 22.00 per cent by small farms, 43.00 per cent by medium farms, 18.00 per cent by large farms. The net operated area is 4.73 acre/household and the GCA is 7.03 acre/household on overall farms. The overall cropping intensity is 14.94 per cent. Out of the total operated area, the study finds that tube well provides irrigation to about 84.90 per cent constituting 74.70 per cent from diesel run tube well and 10.20 per cent by electricity run tube well. Tanks and other sources contribute only 98.0 per cent irrigation to the net operated area. Rainfed area is about 5.30 per cent of the net operated area. It reveals that the major source of the irrigation is tube well in the study area. As regards the availability of credit, it is observed that a sum of Rs. 3829.20/household on overall farms. Out of it, 55.24 per cent is obtained from institutional sources. Similarly the availability credit is Rs. 809.52/acre on overall farms. Out of it, institutional sources contribute 55.24 per cent. It reveals that nearly more than half of the total available credit is met by institutional sources. It is to be noted here that out of per household total available credit, 57.93 per cent is used for productive purposes on overall farms. It is further observed that each household owes productive assets for a total value of Rs. 37027 at current level of prices whereas that of Rs. 5284/acre. The analysis of nature of tenancy in leasing-in land is in terms of fixed rent comprising cash (36.17%) and kind (63.83%). The area under HYV seeds are 30.18 per cent for paddy and 89.09 per cent for maize in kharif 2008; 49.78 per cent for wheat, 4.27 per cent for pulses and 3.20 per cent for oilseeds in rabi 2008 and 15.33 per cent for mango, 7.87 per cent for litchi crops, 12.72 per cent for total vegetables and 11.08 per cent for others in horticultural crops during 2008-09. The analysis of area under HYV seeds reveals that it is higher in maize crop followed by wheat and paddy. Pulses and oilseeds are mainly grown by traditional varieties of seeds due to lack of improved/HYV seeds. The analysis of cropping pattern of the selected farmers reveals that kharif crops occupy 41.96 per cent, rabi crops 31.01 per cent and horticultural crops 27.03 per cent of the GCA. Staple food crops like paddy, wheat and maize together occupy 65.15 per cent of the

GCA. The overall value of the output is estimated at Rs. 67087/household and Rs. 9637/acre. The overall cost of production is calculated at Rs. 5563/acre constituting 71.49 per cent for materials and 28.51 per cent for labour component. The overall net returns are Rs. 61524/household and Rs. 4278/acre. Rs. 5701/household is the overall non-farm income and the total income is traced out at Rs. 67225/household on overall farms.

1.6 Production Structure and Resource use under Horticultural Crops

There is no doubt in the fact that an analysis of the economics of production of the selected horticultural crops provides us with a deeper insight relating to the impact of NHM. The findings on production structure and resource use of the selected horticultural crops reveal that in case of mango, total revenue accrued per acre of land stands quite high (as also the cost of production), thereby generating higher net returns. In sharp contrast to this, total revenue accrued per acre of land from litchi cultivation comes to be lower than mango cultivation (as also the costs of production). Again a comparison of net returns from horticultural and non-horticultural crops reveal that net return per unit of land from selected horticultural crops (viz., mango and litchi) turns out to be much higher than the net return per farm from kharif and to some extent rabi crops. However, net return per unit of land from mango cultivation turns out to be more than double than from litchi.

Table 1.3: Net returns (gross value of output - total cost) from horticultural and non-horticultural crops (crop wise Rs per acre)

Name of the crop	Marginal	Small	Medium	Large	Total
Kharif crops during 2008					
Paddy	8910.93	8330.77	11138.87	10752.63	9252.23
Maize	6614.57	7913.36	7491.50	9317.00	7430.77
Rabi crops during 2008					
Wheat	8927.94	8267.21	10121.45	11351.82	9209.72
Lentil	9206.07	12244.13	11174.09	13059.11	10906.48
Gram	5597.98	6165.18	6778.95	7073.68	6176.52
Horticultural crops during 2008-09					
Mango	25827.00	25937.30	24503.00	22622.00	23247.35
Litchi	11839.80	10348.30	9171.00	10828.80	9999.92

As regards human labour application per unit of land, it has been observed that the application of human labour (including family labour) remains much higher for mango and litchi crops as compared to traditional kharif and rabi crops.

A more detailed crops specific activities wise analysis of use of human labour reveals that in case of mango cultivation, a major part of human labour has been expended in weeding and inter-cultural operations and harvesting and collection followed by application of manure and fertilizer and providing irrigation. In particular about 68.32 per cent of total human labour is expended on recurring activities undertaken annually and 31.68 per cent on fixed activities undertaken during the plantation year on total farms. Almost same trend was indicated across the farm sizes. In case of litchi cultivation, about 66.37 per cent of total human labour is expended on recurring activities and 33.62 per cent on fixed activities undertaken during the plantation year on total farms. However, a major part of human labour has been expended on harvesting and collection followed by application of fertilizer and manure, weeding cultural operation etc. which are somewhat different compared to mango cultivation for recurring activities. Farm wise analysis reveals almost the same trend.

In case of marketing of the produce, it is hard to find that in case of both mango and litchi, there has been a complete absence of formal marketing channels like government agencies, cooperatives to the relief of the farmers. As such most of the produce is sold to the merchant/trader on pre-arranged contract followed by the wholesale market, local market, directly to the villagers and intermediaries at farm gate.

Moreover, it is extremely unfortunate to observe that none of the sample beneficiary farmers are involved in on-farm processing activities. In fact, there is complete absence of mango or litchi processing plants in the regions concerned. As such, output is sold in raw form. There is no value addition in either of the sample produces.

1.7 Impact of NHM on the Expansion of Horticultural Crops

An analysis of the subjective perceptions of the farmers in general and the beneficiaries owing to implementation of this mission is particular brings out some interesting observations. While analyzing the impact of NHM on area and yield of selected horticultural crops viz., mango and litchi during a period of 2004-05 to 2009-10, it was found that the extent of expansion of area was impressive but the overall in yield was not satisfactory in case of both the crops, which may be due to gestation period of the new cropped area. In case of mango crop, the average area increased from 0.26 per household during 2004-05 to 0.75 acre per household during 2009-10, indicating 2.88 times increase during 2009-10. Similarly, the average area of litchi crop has increased from 0.069 acre per household during 2004-05 to 0.280 acre per household during 2009-10, indicating 4.06 times increase during 2004-05 to 2008-09. The yield rate actually declined in case of mango crop from 59.14 quintals per acre in 2004-05 to 45.74 quintals per acre in 2009-10. However, in case of litchi crop, it increased sharply from 32.17 quintals per acre in 2004-05 to 38.08 quintals per acre in 2009-10.

Table 1.4: Impact of NHM on Area and Yield – of Mango and Litchi

Year	Area cultivated in acres per household					Yield rate obtained quintals per acre				
	Marginal	Small	Medium	Large	Total	Marginal	Small	Medium	Large	Total
Crop – 1 (Mango)										
2004-05	0.05	0.12	0.19	0.78	0.26	56.30	57.70	60.12	61.22	59.14
2005-06	0.05	0.12	0.19	0.78	0.26	55.00	52.00	58.30	59.40	56.55
2006-07	0.18	0.36	0.63	2.03	0.75	29.10	38.70	39.40	42.30	38.02
2007-08	0.18	0.36	0.63	2.03	0.75	31.30	40.20	40.60	42.80	39.16
2008-09	0.18	0.36	0.63	2.03	0.75	40.40	43.20	44.30	48.20	43.40
2009-10	0.18	0.36	0.63	2.03	0.75	42.00	47.00	45.00	49.50	45.74
Crop – 2 (Litchi)										
2004-05	0.002	0.038	0.092	0.113	0.069	28.20	30.50	32.90	36.20	32.17
2005-06	0.002	0.038	0.092	0.113	0.069	29.10	30.80	32.60	35.80	32.19
2006-07	0.012	0.149	0.274	0.711	0.280	19.30	30.20	23.40	25.50	32.38
2007-08	0.012	0.149	0.274	0.711	0.280	22.20	24.70	23.50	26.70	24.12
2008-09	0.012	0.149	0.274	0.711	0.280	25.40	26.20	25.40	28.30	26.10
2009-10	0.012	0.149	0.274	0.711	0.280	40.00	38.75	36.25	39.80	38.08

As far as the area under rejuvenation/protection, resources procurement through NHM and the resulted increase in production is concerned, no cases of rejuvenation are found in case of both the sample crops. The state annual action plan of NHM for the years 2006-07 and 2007-08 relating to rejuvenation also shows that the level of

financial achievement is just 15.00 per cent. It is further at the low ebb during 2008-09 and 2009-10.

As regards the NHM reaching to the households with resource provision, it is found that about 71.00 per cent of total NHM resource procurement by the sample households was through state department of horticulture followed by 21.00 per cent through private nurseries and 8.00 per cent through fellow/progressive farmers. The majority of sample farmers were benefitted through various promotional activities undertaken through NHM. About 45.00 per cent farmers said that they established new garden. About 27.00 per cent farmers told that they made use of available good quality planting material like nursery through NHM. Nearly 26.00 per cent were found promoted of INM/IMP, 25.00 per cent said that their capacity builded through training made under NHM and 24.00 per cent said that they were helped for organic farming. Not a single farmer was found benefitted under rejuvenation, upgraded issue culture unit, mother stock block maintenance under poly cover to protect from adverse weather conditions, raising root stock seedling under net house conditions, ploy house with ventilation, insect proof nettings, fogging and sprinkler irrigation, pump house to provide sufficient irrigation, soil sterilization, protected cultivation and of course, post harvest management. However, it is true that these components of the NHM scheme were either not adopted under NHM or did not qualify the eligibility criteria to avail such facilities.

The subsidy was also provided to the sample farmers. Cent per cent sample farmers were found to receive the subsidy made under NHM scheme. The average aggregate amount of subsidy was Rs. 24345.40 per household. However, it varies from Rs. 5316.40 per household to Rs. 65382.50 per household across the farm sizes. The percentage of subsidy as a percentage of total investment was indicated at 61.02 per cent comprising 14.44 per cent on account of supply of sapling and 46.58 per cent under the cash benefit.

Since capacity building is an integral part of NHM scheme so it was found that the training was provided to the sample farmers through various sources. It was just

1.33 times per household per year received from the state department of horticulture followed by SAU (0.04 time), others (0.03 time), KVK (0.02 time) and input dealers (0.01 time). The training sessions arranged for 0.59 day per household per year by the state horticulture department followed by 0.04 day each by SAU and KVK and 0.01 day each by input dealers and others.

The perceptions of the beneficiary farmers about their experiences in cultivating horticultural crops with the help of NHM assistance are very helpful in analyzing the performance of NHM scheme. Cent per cent of sample farmers told that NHM helped them by providing seedling nursery for increasing the area under horticultural crops. On an average 48.00 per cent expressed that NHM helped in capacity building by providing training. Cent per cent opined that financial assistance made under the programme is a good point, 54.00 per cent expressed about subsidy provision and 48.00 per cent for training. Regarding the increased employment opportunities, 54.00 per cent of sample households said that by increasing area under horticultural crops employment opportunities have increased. About 31.00 per cent of sample households have reported that their income has increased up to 20.00 per cent after adopting horticultural crops with the help of NHM. About 17.00 per cent reported about increase in income by 20 to 40 per cent and 11.00 per cent by 40 to 60 per cent.

Table 1.5: Perception of households about the NHM (% of households saying 'Yes')

Details of training	Marginal	Small	Medium	Large	Total
A. How NHM has helped you to increase your area under horticultural crops					
By providing seedling/nursery	17.00	22.00	43.00	18.00	100.00
By providing material inputs	0.00	0.00	0.00	0.00	0.00
By capacity building (providing training)	8.00	12.00	22.00	6.00	48.00
By providing processing facilities	0.00	0.00	0.00	0.00	0.00
By providing market for our end product	0.00	0.00	0.00	0.00	0.00
By providing procurement facility	0.00	0.00	0.00	0.00	0.00
B. What are the good points in the policy towards NHM					
Financial assistance	17.00	22.00	43.00	18.00	100.00
Building infrastructure	0.00	0.00	0.00	0.00	0.00
Capacity Building (awareness camps / training etc)	8.00	12.00	22.00	6.00	48.00
Subsidy provision	12.00	11.00	24.00	7.00	54.00
Any other	0.00	0.00	0.00	0.00	0.00
C. Do you think NHM has increased employment opportunities for the farmers and agricultural Labourers, How?					
By increasing area under horticultural crops that are manually operated	7.00	14.00	26.00	7.00	54.00
By establishing horticultural processing units in the local areas	0.00	0.00	0.00	0.00	0.00
By providing subsidy to those who have diversified their crops from field to horticultural crops	4.00	6.00	12.00	13.00	35.00
No NHM has not increased employment in any way	10.00	8.00	17.00	11.00	46.00
D. Do you think your income has grown up after adopting horticultural crops with the help of NHM. If yes how much					
less than 20 %	6.00	9.00	11.00	5.00	31.00
20 to 40 %	5.00	3.00	3.00	6.00	17.00
40 to 60 %	1.00	4.00	2.00	4.00	11.00
60 to 100 %	0.00	0.00	0.00	0.00	0.00
No increase at all	5.00	6.00	27.00	3.00	41.00
E. Are farmers in your village aware about the National Horticulture Mission, How?					
They have actively benefited from the subsidies provided by the NHM	8.00	7.00	20.00	7.00	42.00
They actively participate in the training programmes provided by the NHM	3.00	5.00	11.00	3.00	22.00
They have benefited from the infrastructural building up being done by the NHM	0.00	0.00	0.00	0.00	0.00
They have been able to raise their area under horticultural crops with the help of NHM	4.00	4.00	3.00	6.00	17.00
No they stand aloof and completely unaware about the activities of NHM	6.00	11.00	13.00	5.00	35.00
F. What changes do you suggest to make NHM more effective – mention					
Irrigation Facilities	11.00	13.00	22.00	7.00	53.00
Fencing Provisions be made	8.00	7.00	11.00	3.00	29.00
Increase in Project costs & subsidy	6.00	8.00	7.00	6.00	27.00
Research/Inventions in case of Litchi crops be made in view of climate change	3.00	7.00	11.00	4.00	25.00
Original medicines for spraying the plants be made available	0.00	0.00	7.00	6.00	13.00
Power supply should be increased	3.00	9.00	14.00	7.00	33.00

1.8 Policy Suggestions

Bihar has excellent development potential of horticultural sector despite several constraints. The efforts over the last some years made for systematic and planned development of horticultural sector have started gaining responses from the producers. However, there are several challenges, which are required to be addressed seriously. Moreover, based on the findings and observations of the present study, the following are the suggested policy measures to mitigate the problems relating to performance of the NHM. The specific policy suggestions may be presented hereunder:

- i.* For expansion of area under horticultural crops, irrigation is most important input, so irrigational is required, which can be ensured by re-starting non-functional tube wells and facilities of micro-irrigation may be provided. So, 53.00 per cent of the sample farmers suggested for making them available of irrigational facilities (*Attention: Directorate of Agriculture, Government of Bihar*).
- ii.* Since irrigational facility is related to the un-interrupted power supply, so 33.00 per cent of the sample farmers suggested for increase in power supply in the region. Though, the state government is contemplating the efforts for separate power grid or transmission line for the rural areas, which may be expedited (*Attention: Bihar State Power (Holding) Company Ltd, Government of Bihar*).
- iii.* Cattle grazing is largely found in the study region/area, so, 29.00 per cent of the sample farmers suggested for fencing of the new gardens, which may be met by RKVY or other related schemes (*Directorate of Horticulture, Government of Bihar*).
- iv.* Due to soaring of input prices, 27.00 per cent of the sample farmers suggested to increase the costs of project and the amount of subsidy (*Ministry of Agriculture, Government of India*).
- v.* Adverse impact of climate change was also found in the study area particularly on litchi crop, so 27.00 per cent of the sample farmers suggested the need of new researches and inventions, particularly suited to the litchi crop (*ICAR & SAU*).
- vi.* Attack of insects and pests was found in the study area on the sample crops, so 13.00 per cent of the sample farmers suggested ensuring original medicines for spraying the plants (*Directorate of Agriculture, Government of Bihar*).

vii. It was observed that there is insufficient monitoring and supervision personnel of the new gardens by the extension staff of the NHM scheme, which may be due to lack of sufficient staff and providing facilities for the same. To meet such limitations, outsourcing of the field staff may be done (*Directorate of Horticulture, Government of Bihar*).
