

Research Article

Impact Evaluation of Orange Based Projects Implemented under the Horticultural Mission for the North Eastern and Himalayan States (HMNEH) in Kamrup District of Assam

J.K. Sharma^{1*}, N. Mazumder² and S. Gogoi³

^{1,2}Horticultural Research Station; Assam Agricultural University, Kahikuchi, Guwahati-781017, Assam, India

³Dept. of Horticulture, Assam Agricultural University, Jorhat-785013, Assam, India

agriperson@gmail.com*; +91 9435051697

Received: October 11 2018/Accepted: 24 November 2018/Published: 07 December 2018

Abstract

An impact evaluation study on the performance of orange based projects under the centrally sponsored scheme Horticultural Mission for the North Eastern and Himalayan States (HMNEH) in Kamrup District of Assam was carried out using an ex post facto approach, following a multi-stage, purposive cum random sampling design. Assessing the area expansion and production trends, extent of technology adoption, extent of commercialization and employment generation were the main objectives of the investigation. Two orange based projects, one each belonging to the area expansion and rejuvenation components, were sampled for the investigation. The study revealed that the average area expansion in orange was 4% during 2008-09, which rose to 11% during 2009-10 and to 22% during 2010-11. The average production in orange was 191/plant during 2008-09, which rose to 233/plant during 2009-10 and to 268/plant during 2010-11, with an overall yield increase of 39.23% till 2010-11 over the base year of 2008-09. Majority of the recommended technologies were partially adopted by the beneficiaries. The study revealed that there existed an average gap of 37.40% between the quantum of labour deployed by the beneficiaries as against the actual requirement worked out per hectare in terms of different management activities. A positive trend in commercialization was noticeable as a healthy increase of 103.65% in gross produce value sold during 2010-11 over 2008-09 was revealed.

Keywords: Impact evaluation, orange based projects, horticultural mission, ex post facto approach.

Introduction

Impact assessment is a critical component of agricultural research in that it helps to define priorities of research and facilitate resource allocation among programmes, guide researchers and those involved in technology transfer to have a better understanding of the way new technologies are assimilated and diffused into farming communities, and show evidence that clients benefit from the research products (Manyong *et al.*, 2001). The Horticultural Mission for the North Eastern and Himalayan States (HMNEH), formerly referred to as the Technology Mission for Integrated Development of Horticulture in the North Eastern Region (TMIDH-NE) was launched in Assam during 2001-02 as a centrally sponsored scheme in order to promote the integrated and holistic development of the horticulture sector in the state. More than a decade has elapsed since the inception of the programme in Assam and hence it became imperative to evaluate the performance of the programme commodity-wise *vis-a-vis* the objectives envisaged. Against this background, orange based projects implemented under the scheme in Kamrup district of Assam were specifically selected for the present study.

Mahanta and Konwar (2014) in a study conducted in the Tinsukia district of Assam reported that traditional methods of cultivation, absence of storage and packaging facilities and transportation bottlenecks are major impediments to the commercialization of orange. So, considering the above facts, the present study was undertaken to assess the impact of the scheme with reference to area expansion and production trends, technology adoption, extent of commercialization and employment generation.

Materials and methods

Study area and sampling: Kamrup district in the state of Assam comprised the study locale. The different HMNEH project areas within the district comprised the actual geographical locations for the purpose of data collection. Following a multi-stage, purposive cum random sampling plan, two orange based projects, one each from Sonapur (Rongdoloi Orange Growers' Society) and Bongaon (Satekona Krishok Got) Agricultural Development Officer (ADO) circles were selected randomly. While the former component was on area expansion, the latter was on rejuvenation.

Selection of respondents: In order to elicit factual and unbiased responses, it was proposed to include the President of each selected HMNEH project along with at least three other members as beneficiary respondents. In addition, in order to accommodate the perspectives of the Agricultural Development Officers (ADOs) as representatives overseeing the implementation of HMNEH projects within their respective areas of jurisdiction on behalf of the implementing agency, all the ADOs of the selected ADO circles were automatically included in the study sample as non-beneficiary respondents.

Data collection and analysis: For the purpose of data collection, an appropriate, pre-tested, semi-structured investigation schedule was constructed. Precaution was taken to include all the impact indicators and other dimensions in the schedule in line with the objectives of the investigation, keeping in mind both the categories of respondents, i.e., beneficiaries as well as the ADOs. Data from beneficiary respondents was collected through group interview method using the Focus Group Discussion method, supplemented by field visit. Personal interview method was used to collect data from non-beneficiary respondents. Appropriate statistical measures like frequency, percentage and mean were used to analyze the data.

Results and discussion

1. Project impact: Area expansion

The area expansion trend of the two projects for three consecutive years, post initiation is indicated in Table 1. As can be inferred from Table 1, the average area expansion in orange was 4% during 2008-09, which rose to 11% during 2009-10 and to 22% during 2010-11. The Table further reveals that annual increase in coverage was more in the area expansion component than in the rejuvenation component, which seems to be logical. Respondents cited the following drivers for resorting to area expansion:

- Good market price of orange
- Proximity to metropolitan market (Guwahati) reduces dependence on middlemen
- Easy marketing of produce even beside the National Highway located nearby
- Good transport and communication network

2. Project impact: Production trends

The production trends of the HMNEH orange based projects for three consecutive years, post initiation are depicted in Table 2. Table 2 reveals that the average production in orange was 191/plant during 2008-09, which rose to 233/plant during 2009-10 and to 268/plant during 2010-11, with an overall yield increase of 39.23% till 2010-11 over the base year of 2008-09. The Table further reveals that annual

increase in production was more in the area expansion component than in the rejuvenation component.

3. Project impact: Technology adoption

The extent of technology adoption in the area expansion and rejuvenation components is depicted in Table 3. With respect to technology adoption by the beneficiaries in the area expansion component, Table 3 highlights that only site selection was fully adopted. Majority of the recommended technologies were partially adopted by the area expansion beneficiaries. While removal of parasitic plants was discontinued by them, technologies of micronutrient application, irrigation management, harvesting and post-harvest handling practices were not adopted by them. The adoption of technologies relating to site selection, planting material and spacing was not relevant to the rejuvenation component as the project was initiated on established orchard. However, INM, pruning and training and weeding practices were partially adopted by the rejuvenation beneficiaries. It is noteworthy that although the technologies of pest and disease management, micronutrient application, removal of parasitic plants and irrigation are crucial components of rejuvenation programme, the same were either discontinued or not adopted by the beneficiaries. In addition, harvesting and post-harvest handling practices were also not adopted by them.

4. Project impact: Extent of commercialization

The extent of commercialization of orange in the HMNEH projects is projected in Table 4. A positive trend in commercialization is noticeable through the Table as a healthy increase of 103.65% in gross produce value sold during 2010-11 over 2008-09 is depicted. The increase is attributable to the increase in area under projects, higher productivity as well as the incremental higher farm gate price of orange over the years. It can be inferred from Table 4 that the extent of commercialization was more in the area expansion component than in the rejuvenation component although fruits in the latter fetched a much higher market price. Main hindrances faced in commercialization as expressed by the beneficiaries were:

- Lack of irrigation facilities despite the presence of natural water source
- Lack of proper transportation facility of produce
- Poor financial strength compels most of the beneficiaries to sale produce to middlemen at very low price
- Absence of appropriate storage facility to avoid distress sale
- Absence of market shed with display facilities
- Absence and/or non-functional on-farm handling unit
- Absence of knowledge on marketing management

Table 1. Area expansion trend of HMNEH orange based projects.

Project	Initial project area (ha)	Year of start	Year wise area coverage (ha)			Overall percentage increase/decrease over initial
			2008-09	2009-10	2010-11	
Rongdolo Orange Growers' Society (Area expansion component)	50	2007-08	54 (8.00)	59 (18.00)	67 (34.00)	34.00%
Satekona Krishok Got (Rejuvenation component)	50	2007-08	50 (0.00)	52 (4.00)	55 (10.00)	10.00%
Year wise average			52.00 (4.00)	55.50 (11.00)	61.00 (22.00)	22.00%

*Figures in parentheses indicate percentage.

Table 2. Production trends of HMNEH orange based projects.

Project	Production (No/plant)			Percent increase/decrease over 2008-09 & 2009-10
	2008-09	2009-10	2008-09	
Rongdolo Orange Growers' Society (Area expansion component)	202 (80,800)	256 (1,02,400)	202 (80,800)	256 (1,02,400)
Satekona Krishok Got (Rejuvenation component)	180 (72,000)	210 (84,000)	180 (72,000)	210 (84,000)
Year wise average	191 (76,400)	233 (93,200)	191 (76,400)	233 (93,200)

*Figures in parentheses indicate yield (in nos/ha).

Table 3. Extent of technology adoption in the HMNEH orange projects.

Technology	Extent of adoption (area expansion)				Extent of adoption (rejuvenation)			
	Full	Partial	Discontinued	Non-adoption	Full	Partial	Discontinued	Non-adoption
Site selection	✓						NA	
Planting material		✓					NA	
Spacing		✓					NA	
INM		✓				✓		
Micro-nutrient				✓				✓
Pruning & training		✓				✓		
Removal of parasitic plants			✓					✓
Weeding		✓				✓		
Irrigation				✓				✓
Pest management		✓					✓	
Disease management		✓					✓	
Harvesting				✓				✓
Post-harvest handling				✓				✓

5. Project impact: Employment generation

The employment generation status in the HMNEH orange projects is shown in Table 5. Table 5 reflects that there existed an average gap of 37.40% between the quantum of labour deployed by the beneficiaries as against the actual requirement worked out per hectare in terms of activities such as weeding, pruning and training, manuring and fertilizer application, application of pesticides, harvesting and marketing etc.

It is seen that the existing gap between the quantum of labour deployed by the beneficiaries as against the actual requirement was higher in the rejuvenation component (46.22%) as compared to the area expansion component (28.57%). Beneficiaries cited their poor economic status and high labour wages for being unable to deploy the required quantum of labour in their orchards. It can be thus summarized that there exists a need to deploy additional labour in the projects for their better management and concomitant profitability.

Table 4. Extent of commercialization in the HMNEH Orange projects.

Component	Quantity produced/year (in lakhs)			Quantity sold/year** (in lakhs)			Gross value of produce sold (Rupees in lakhs)			Percent increase/decrease of gross value of produce sold over 2008-09	
	2008-09	2009-10	2010-11	2008-09	2009-10	2010-11	2008-09	2009-10	2010-11	2009-10	2010-11
Area expansion	43.63	60.41	83.08	39.26	54.37	74.77	62.81 (1.60)	95.14 (1.75)	149.54 (2.00)	51.47%	138.08%
Rejuvenation	36.00	43.68	49.50	32.40	39.31	44.55	105.30 (3.25)	137.58 (3.50)	178.20 (4.00)	30.65%	69.23%
Average	39.81	52.04	66.29	35.83	46.84	59.66	84.05	116.36	163.87	41.06%	103.65%

*Figures in parentheses indicate farm gate price (Rupees/fruit) **10% reduction considered in quantity sold.

Table 5. Employment generation status in the HMNEH orange projects.

Component	Orchard management		Harvesting & marketing		Total (A)	Actual labour requirement**/ha (B)	Requirement Gap (B-A)
	No. of persons employed/ha/yr		No. of persons employed/ha/yr				
	Family	Others	Family	Others			
Area expansion	13	32	09	11	65	91	26 (28.57)
Rejuvenation	15	22	15	05	57	106	49 (46.22)
Average	14	27	12	08	61		37.50 (37.40)

*Figures in parentheses indicate percentage; **For established orchard.

Conclusion

1. Since market access was found to positively impact area expansion, hence, thrust on establishing forward linkages would be the call of the hour and accordingly appropriate intervention and infrastructure should be created and implemented.
2. The study revealed that technology adoption by beneficiaries highlighted technological gaps in various technological components. Hence these gaps need to be plugged through appropriate extension approaches for enhanced productivity and profitability.
3. Looking at the resource poor status of majority of the beneficiaries, an intensive approach is suggested instead of an extensive approach.
4. More emphasis needs to be placed on the rejuvenation component as scope for area expansion is limited.
5. Emphasis on scientific intercropping for income generation during crop gestation period may be advocated.
6. In order to provide teeth to the extent of commercialization of orange, provision of irrigation facilities, transportation of produce and post-harvest handling facilities need to be accorded priority status.

References

1. Mahanta, D.K. and Konwar, A. 2014. Production and Marketing of Orange in Assam – A Study on Doomdooma Region of Tinsukia District. *J. Agri. Life Sci.* 1(1): 83-90.
2. Manyong, V.M., Douthwaite, B., Coulibaly, O. and Keatinge, J.D.H. 2001. Participatory impact assessment at the International Institute of Tropical Agriculture: functions and mechanisms. In: TAC Secretariat, editor. *The future of impact assessment in the CGIAR: needs, constraints and options.* Food and Agriculture Organization, Rome, Italy. pp.69-74.

Cite this Article as:

Sharma, J.K., Mazumder, N. and Gogoi, S. 2018. Impact Evaluation of Orange Based Projects Implemented under the Horticultural Mission for the North Eastern and Himalayan States (HMNEH) in Kamrup District of Assam. *J. Acad. Indus. Res.* 7(7): 89-92.