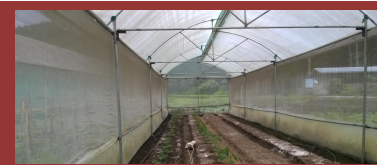
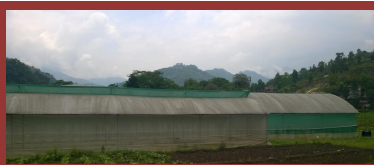


An Economic Analysis of Protected Cultivation under MIDH in Sikkim



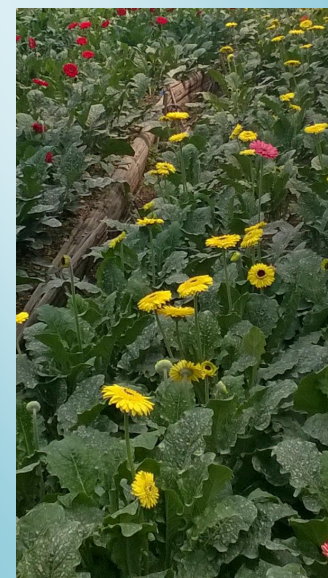
**Vivekananda Datta
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**Study sponsored by Ministry of Agriculture and Farmers Welfare
Government of India, New Delhi**

**Agro-Economic Research Centre
(For the States of West Bengal, Sikkim and Andaman & Nicobar Islands)
Visva-Bharati, Santiniketan
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Preface

The present study entitled “An Economic Analysis of Protected Cultivation under MIDH in Sikkim” has been assigned by the Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare, Government of India, New Delhi with full financial endorsement and under the close coordination of Agro-Economic Research Centre (AERC), Himachal Pradesh, Shimla.

Besides increasing productivity, protected farming is also expected to provide employment opportunities to the unemployed youth making it an attractive agricultural option for the farmers as well as rural service providers. Based on both primary as well as secondary data collected from the state of Sikkim, the present study evaluated the impact of Protected Cultivation under Mission for Integrated Development of Horticulture (MIDH) on crop productivity and income of farmers. It also examined the level of adoption and its constraints in the application of protected cultivation in the state of Sikkim.

The present study was conducted by Mr. Vivekananda Datta, Dr. Dabajit Roy, Mr. Kali Sankar Chattopadhyay and Mr. Debanshu Majumder of this Centre. They were assisted by Mr. Ashok Sinha, Dr. Ranjan Kumar Biswas and Mr. Rishav Mukherjee in field survey, data entry and tabulation. Typing of the report was done by Mr. Munshi Abdul Khaleque and Mr. Nityananda Maji. Secretarial assistance for the study was provided by Mr. D. Mondal, Mr. D. Das, Mr. P. Mitra and Mr. A.R. Patra. Mr. B. Singh and Mr. S. Hansda also extended support service for conducting this study.

We convey our sincere gratitude to the Department of Horticulture & Cash Crop Development (FSOAD), Government of Sikkim, and particularly to Mr. Khorlo Bhutia, Principal Director cum Secretary, Mr. K.T. Bhutia, Addl. Director, Dr. P. Subba, Mr. D. K. Bhandari, Mr. M. B. Subba all Jt. Directors, Mr. Sherop Bhutia and Mr. D. Bhujel, Deputy Directors, and all research and administrative staff for their effective help and cooperation during field survey.

We acknowledge the niceties of Prof. Swapan Kumar Dutta, Vice Chancellor (Officiating), Visva-Bharati, Madam Ms. Sangeeta Verma (Economic and Statistical Adviser) and Shri P. C. Bodh (Adviser-AER Division) of Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare, Government of India, New Delhi, and Prof. Bidhan Chandra Roy, Hony. Deputy Director, AERC, Visva-Bharati for their guidance and necessary support in completion of the study.

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Executive Summary

Background

Sikkim is an agrarian State with 64 per cent people dependent on Agriculture and allied activities. State Government has given emphasis to the horticulture sector with a view to attain higher levels of rural prosperity by adopting the policy of 'growth with sustainability' for higher income generation to farming community. The main objective lies on securing maximum production of horticulture crops and managing primary agro-resources like soil, water and bio-diversity. Large cardamom, ginger and turmeric are the major spice crops, while mandarin orange, guava, mango, banana are the principal fruits grown in the State. Sikkim is also a paradise for flowers. Gladioli, anthuria, lilies, primulas, rhododendrons, orchids as well as many other floral species thrive here. The Department of Horticulture and Cash Crop Development (HCCDD) is involved in motivating and providing technical guidance to local farmers and taking forward the mission of the Government towards Horticulture Development in Sikkim. The Centrally Sponsored Scheme of Horticulture Mission for North East and Himalayan States (HMNEH) is being implemented in Sikkim since 2001-02. From April 2014 onwards, HMNEH has been subsumed under Mission for Integrated Development of Horticulture (MIDH), for the holistic growth of the horticulture sector covering fruits, vegetables, root & tuber crops,

Due to population growth coupled with increasing pressure on natural resources i.e. land & water, decreasing land holdings, climate change, rising income level, and fast increasing demand for quality horticultural fresh produce, people are forced to shift towards modern technologies of crop production like protected cultivation. In Sikkim, however, the climatic conditions and rich bio-diversity give ample opportunity for such cultivation under protected conditions. Protected cultivation leads to conversion of some portion of existing area under vegetable cultivation, towards high value crops for higher income round the year. Activities like construction of green houses, shade net house, plastic mulching, and plastic tunnels, anti bird/ hail nets are promoted under the MIDH. National Horticulture Board (NHB) is also implement the projects having area above 2500 sq. m. wherein provision were made for selecting a variety of construction material for green houses and shade net houses. The present study is an attempt to assess the impact of MIDH with the following specific objectives:

- To study the progress in providing assistance for establishing the poly houses under MIDH programme and to examine the expenditure incurred in establishment of poly houses and means of financing.
- To study the economics of production of flowers and vegetables under protected conditions in the State and to analyse the worth of protected cultivation venture.
- To analyse the systems adopted for marketing the produce under protected conditions in the State.
- To examine the problems faced by the farmers in production and marketing of Flowers and vegetables under protected conditions in the State.

The study is based on survey conducted in two districts viz. East Sikkim & South Sikkim. These two districts were selected on the basis of highest number of poly-houses. Following the same criteria, two development blocks, one from each district were selected purposively. Accordingly the Gangtok block from East Sikkim and Namchi block from South Sikkim were selected. In the next stage, all the registered poly-houses and a sample of 25 vegetable growers and 25 farmers cultivating flowers were selected randomly from each block. Thus, the study is based on 100 farmers cultivating in poly-houses in two districts.

The sample is classified into three size classes based on the size of the poly houses. The polyhouses covering an area less than 250 square meters are considered small, while those between 250 square meters to 500 square meters are considered medium in size. Those with more than 500 square meters cover area to less than 1000 square meters of cover area are considered large farms. In Sikkim, however, in both two districts, all 100 sampled polyhouse owners turned out to be small (less than 250 m²).

Major Findings:

- i) In case of polyhouse development under MIDH in Sikkim, it is found that Centrally Sponsored Scheme of Horticulture Mission for North East and Himalayan States (HMNEH) is being implemented in all the districts of Sikkim.
- ii) An area of 415.96 ha has been covered under protected cultivation, while 48835 farmers have been trained under various horticulture activities.
- iii) An amount of Rs. 373.47 crore was released to the State till 2014-15 and the State Government has reported an expenditure of 328.97 crore.

- iv) Average family size of the small farmers is 4.21 with high educational standards. The major primary occupation is farming, while the subsidiary occupation is self-employment in non-farming sector.
- v) Average net operated area is 1.05 ha, and 38 per cent of total cultivated land is irrigated.
- vi) A major portion of non-farm income for the farm households comes from salary, followed by animal husbandry and petty business.
- vii) The sample polyhouses are simple in design with single-tier cultivation only. Information regarding polyhouses and scheme/subsidy has been obtained from the state department of agriculture itself, and from friends & relatives to limited extent.
- viii) Continuous efforts by the Government Officials, easy access to technologies, availability of subsidy, and possibility of higher income acted as key motivating factors for protected cultivation in Sikkim.
- ix) Besides the contractor's delay in construction of polyhouses, adjustment with the new crop growing technology has been found to have acted as hindrances for the growth of protected cultivation. However, the implementing authority took a supportive/neutral role in the supervision of polyhouse construction.
- x) It comes out that majority of the farmers are yet to adjust with the new cropping practices introduced, especially organic cultivation, while all the farmers suggested improvement of storage facilities.
- xi) It was observed that equipments like heater, cooler, humidifier, and fogger are absent in all of the poly-houses. Only 60 per cent of farms are provided with drip irrigation facilities. Fifty two per cent of farms have built vermi-compost pits.
- xii) It is observed that 60 per cent of the farmers received training from the government sources, while 39 per cent of them are benefitted from the nearby Krishi Vigyan Kendra.
- xiii) It is observed that in case of carnation and jarbera, the selected flower crops for the study grown under polyhouse cover, an overwhelming proportion of total costs are spent on purchasing sapling for producing carnation flower followed by costs of pesticides (organic), formation of beds and for application of fertilizer (organic).
- xiv) It was observed that though cost for cultivation for jarbera under protected condition is significantly higher in comparison to carnation, percentage of net returns in jarbera over carnation is also higher and it is due to higher value of output.

xv) In case of the selected vegetable crops under polyhouse cover, viz. capsicum and tomato, it has been observed that net returns in case of tomato is marginally lower than in case of capsicum cultivation.

xvi) Cultivation of paddy and maize in Kharif season and cabbage and cauliflower in Rabi season are the other significant crops grown by the sample farms in unprotected condition. Except paddy, the cost for absorption of family labour in all other unprotected crops has been found to be higher in marginal farmers than the small farms.

xvii) As far as productivity of crops on unprotected condition of farming is concerned, it is observed that apart from paddy, productivity of all crops for marginal farms is marginally higher than small farms.

xviii) The government of Sikkim has formed FPOs (Farmers-Producers-Organizations), who collect vendible commodities from the farmer and pay the price. For this purpose one motor van (pick-up van) for each FPO has been provided to collect farmers' product from the assemble point (mutually convenient place of the village cluster) and then to dispose it in the nearby market.

xix) Losses in the process of production of flowers like carnation and jarbera are quite high at 4.54 per cent and 4.25 per cent respectively as proportion of their respective production. Payment of wages in flowers is not observed, while retention for family and for gifts to others constitutes a very small proportion of production of both these flowers.

xx) In case of utilization of vegetable crops, it can be observed that losses in relation to production accounts for 2.70 per cent of production for capsicum and 2.55 per cent of production for tomato. Retention for family consumption is higher for tomato (4.64 per cent) than capsicum (1.46 per cent) of production.

xxi) In case of marketing pattern of the protected flower crops, it can be observed that both the flowers are sold only in the local markets, and not to far-off markets. In fact, it can be observed that more than 63.63 per cent of carnation marketed and 61.24 per cent of jarbera marketed has been sold directly to the consumers through FPOs in organic kiosks or in road-side kiosks by the flower growers themselves.

xxii) In case of marketing pattern of the protected vegetable also, we can observe that 71.12 per cent of total capsicum marketed and 62.24 per cent of total tomato marketed is sold directly to the consumers in organic kiosks or road-side markets set up by the government, while the rest is sold in nearby towns through FPOs.

xxiii) The entire marketing process is set up by the state government, and hence presence of middlemen and other intermediaries are not found. Market fee and other such costs are also not observed as the markets are set up and controlled by the government itself.

xxiv) It can be observed here that total expenses borne by the farmers for marketing of carnation stands at 8.18 per cent, while that for jarbera stands at 7.66 per cent of net price received by the grower, which in turn equals to consumer price in the absence of middlemen or market intermediaries.

xxv) In case of capsicum, the total expenses borne by the grower on account of marketing stands at 7.82 per cent, while that for tomato stands at 7.81 per cent of net price received by the grower, which in turn equals to consumer price in the absence of middlemen or market intermediaries.

xxvi) Total production losses for the selected crops carnation, jarbera, capsicum and tomato are 4.54 per cent, 4.25 per cent, 2.70 percent and 2.55 per cent respectively.

xxvii) In case of carnation and jarbera, loss of production occurs primarily while picking of flowers, while the major source of production loss in case of selected vegetables comes out to be pre-harvest losses and losses in transportation.

Policy Implications:

- As Sikkim has the favourable climatic conditions for growing vegetables, flowers and horticultural crops, policies like MIDH help in augmenting growth in agriculture, especially in vegetables, flowers and horticultural crops. Policy makers should consider allocating a higher budget for these states or implement similar schemes in vegetables, floriculture and horticulture.
- Cultivation of vegetables under polyhouse cover in organic cultivation technique seems to be a remunerative proposition for the resource poor farmers also. Therefore, steps need to be taken to promote off-season vegetable cultivation under polyhouse so that the excess labour force can be optimally utilized in agriculture at large.
- In Sikkim, formation of Farmer Producers' Organizations should be encouraged so that the hurdles in post-harvest management and marketing are reduced to the minimum for the marginal and small vegetable producers. Under active state supervision, marketing through FPOs/SHGs can reduce middlemen's commission and keep off other market intermediaries. As members participants, the farmers can themselves act as retailers in government regulated markets and organic kiosks.