FINAL REPORT

Evaluation Study of Technology Mission of Horticulture in Meghalaya State

Sponsored By

Government of Meghalaya,
Programme Implementation
& Evaluation Department, Shillong

Study Conducted By

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FOREWORD

This Report entitled **"Evaluation Study of Technology Mission of Horticulture in Meghalaya State"** is the outcome of a study undertaken at the request of Programme Implementation & Evaluation Department, Government of Meghalaya, Shillong.

We are grateful to the management of the Directorate of Programme Implementation & Evaluation Department, Government of Meghalaya, Shillong for entrusting this study to AISD.

We express our gratitude to the Officials and Staff of the department of Technology Mission of Horticulture and Meghalaya Small Farmers Agribusiness Consortium (MgSFAC), for their full cooperation in the course of the study.

We sincerely hope that the findings and recommendations of the study will enable the Programme Implementation & Evaluation Department to provide fruitful feedback information to the policy makers and planners in the state to work out an effective development programme for horticulture.

Ranchi,
17th Dec. 2013

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ACKNOWLEDGEMENT

The final report entitled "**Evaluation Study of Technology Mission of Horticulture in Meghalaya State**" has been awarded to Asian Institute for Sustainable Development (AISD) by Programme Implementation & Evaluation Department, Government of Meghalaya, Shillong. It is a great pleasure for me to present the report of the project. The report has been revised as per the suggestions of Programme Implementation & Evaluation Department and the data made available to AISD.

First of all, I wish to put on record my sincere thanks and gratitude to Mr. S. Lyngdoh, Joint Director, Programme Implementation & Evaluation Department, for considering AISD as a competent body to conduct the current study and extending all possible help during study. I would like to express our sincere thanks to Mr. P. L. Nongbri, Deputy Director, Programme Implementation & Evaluation Department for coordinating with the Horticulture Dept. regarding procurement of secondary data. I would also thank Dr. C.O. Rangad, Director of Horticulture, all District Horticulture Officials and officials of MgSFAC for providing the required secondary data and constant help and assistance to us during the course of study, without which this study would not have been completed.

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I wish to thank our Study Coordinator Mr. Osborn Frederick, Social Scientist and Mr. Sumantra Mukherjee for coordinating and helping us in planning, designing the research tools and writing the report. I also thank the team of investigators for collecting field data under difficult circumstances. I would also like to thank Mr. Nishant, Project Officer, AISD for revising and finalizing the report.

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I put on record my gratitude to all the officials and staff of Technology Mission of Horticulture Department in Meghalaya for the assistance and help extended to the Research Team in the course of data collection.

Ranchi,
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EXECUTIVE SUMMARY

The Present Study

At the request of Programme Implementation & Evaluation Department, Government of Meghalaya, Shillong, **Asian Institute for Sustainable Development (AISD**), an independent agency conducted the survey on '**Evaluation Study of Technology Mission of Horticulture in Meghalaya State'**.

Disclaimer

Although this report was prepared under the funding from Programme Implementation & Evaluation Department, Government of Meghalaya, Shillong, it bears no responsibility for, nor is in any way committed to, the views and recommendations expressed herein.

Area

The survey was conducted in all the seven (7) districts of Meghalaya. One (1) block per district was chosen randomly and further 17 schemes per block were selected randomly. Therefore, a total of 74 programme units were covered in this study. 74 programme components were spread in 35 villages. A sample of 350 beneficiaries was randomly chosen from 35 villages. Each district had 50 sample respondents (beneficiaries).Out of 350 respondents, 218 were males and 132 were females.

Background of Technology Mission of Horticulture (TMH)

The Technology Mission of Horticulture (TMH) in the Region was launched in 2001-02 to address issues related to production and productivity, post harvest handling, marketing and processing of horticultural crops in the North Eastern states. The Mission covers entire spectrum of Horticulture, right from production to consumption through backward and forward linkages. The Mission consists of four Mini Missions, namely: Mini Mission I, II, III and IV.

The Technology Mission of Horticulture was launched as a centrally sponsored Scheme from 2000, with the primary objective of establishing convergence and synergy among numerous on-going governmental programmes in the areas of production, marketing and processing and to achieve vertical and horizontal integration of these programmes.

Meghalaya is spread over a geographical area of 22,429 sq km. with a border area of 443 km. with Bangladesh. Meghalaya has many rivers such as Daring, Sanda, Umkhri, Digaru in different regions. These rivers have created deep gorges and some of the most beautiful waterfalls. Most of these are rain fed and are therefore seasonal. Meghalaya has rich deposits of valuable minerals like coal, limestone, uranium and silimanite. With average annual rainfall as high as 1200 cm in some areas, Meghalaya is the most wet state of India. It is also a home for many rare species of birds, flora and fauna etc. Meghalaya is rich in forest and agriculture and Horticulture produce.

With all these favorable factors, there is no doubt that the Horticulture Mission in Meghalaya will flourish. Meghalaya has got the potential to remove poverty altogether, increase the per capita income, reduce the infant mortality rate, provide safe water, improve literacy and provide

pucca houses with sanitation facility to each family in the rural areas. This is possible with the Technology Mission of Horticulture in Meghalaya.

If the farmers and the Department of Horticulture work hand in hand then we can surely say that this will be a wealth generator-cum-employment provider mission for the farmers of the state. The Meghalaya Government can take advantage of the National Horticultural Mission for technical, managerial and financial support for creating infrastructure and market for Horticulture produce. These missions will double the revenue of over one lakh families who are presently engaged in Horticulture. In addition, it will also provide additional employment in fruit and vegetable processing industries to over 10,000 youth. The State can lay emphasis on production of traditional cashew, Khasi mandarin (orange), strawberry besides pineapple, turmeric, other medicinal plants and off-season vegetables. It will enable doubling of income of around 2 lakh families and provide employment to 42,500 youth. It will also generate export revenue of not less than Rs. 500 crore.

TMH implementation in Meghalaya:

Physical and Financial Achievement of Technology Mission of Horticulture during 2001-2002 to 2007- 2008

The Evaluation has chalked out some impressive achievements made by the Technology Mission of Horticulture during the period 2001-2008. These achievements have been analysed both in terms of financial and physical.

Financial achievement

Altogether, Rs. 3010.99 lakhs was spent under eight crop based TMH schemes viz. Area Expansion for Fruits, Vegetables, Roots and Tubers, Spices, Plantation Crops, Medicinal Crops, Aromatic Plants and Floriculture during 2001-2008. East Khasi Hill district had (Rs. 540.39 lakhs), West Khasi Hills (Rs. 463.96 lakhs), Ri-Bhoi district (Rs. 695.38 lakhs), Jaintia Hills (Rs. 429.02 lakhs), East Garo (Rs. 106.84 lakhs), West Garo Hills (Rs. 497.58 lakhs), South Garo Hills (Rs. 277.82 lakhs) (Table 3.3).

Apart from these, other components under TMH (viz. Creation of Water Sources, On Farm Management, On Farm Handling Unit, Production of Planting Material, Transfer of Technology, Organic Farming, Agriculture Equipments, Integrated Pest Management, Women Development (SHG Group), Workshop, Arecanut Soakage Tank, Centre for Excellence, Bee keeping, Technical Assistance and Integrated Mushroom Unit were also implemented during 2001-08. During 2001-08, Rs. 5900.78 lakhs was spent for various the various above mentioned components in Meghalaya. East Khasi Hill district had (Rs. 929.58 lakhs), West Khasi Hills (Rs. 581.54 lakhs), Ri-Bhoi district (Rs. 1481.74 lakhs), Jaintia Hills (Rs. 572.88 lakhs), East Garo (Rs. 1215.96 lakhs), West Garo Hills (Rs. 723.14 lakhs), South Garo Hills (Rs. 395.94 lakhs) (Table 3.3).

Scheme wise, expenditure during 2001-08 on Area Expansion of Fruits was Rs. 962.12 lakhs, Vegetables Rs. 510.14 lakhs, Roots and Tubers Rs. 69.8, Spices Rs. 385.08 lakhs, Plantation crops Rs. 215.28 lakhs, Medicinal Crop Rs. 39.28 lakhs, Aromatic plants Rs. 7.75 lakhs, Floriculture Rs. 821.54 lakhs. Similarly expenditure during 2001-08 on Other Support Schemes which like Creation of Water Resources was Rs. 536.195 lakhs, On Farm Management Scheme Rs. 2185.12 lakhs, On Farm handling units Rs. 108 lakhs, Production of Planting Material Rs. 710.5 lakhs, Transfer of Technology Rs. 170.90 lakhs, Organic Farming Rs. 632 lakhs,

Agriculture Equipment Rs. 394.29 lakhs, Integrated Pest Management Rs. 188.32 lakhs, Development of women SHGs Rs. 92.26 lakhs, Arecanut Soakage Tank Rs. 141.64 lakhs, Centre for excellence Passion Fruit Rs. 176.82 lakhs, Centre for excellence Strawberry Rs. 170 lakhs, Centre for excellence Anthurium Rs. 67.38 lakhs, Centre for excellence Rose Rs. 69.93 lakhs, Bee Keeping Rs. 15.1 lakhs, Area Expansion of centre of excellence Rs. 248.9 lakhs, Integrated Mushroom Unit Rs. 50.7 lakhs (Table 3.3 and Table 3.4).

Physical achievement

The implementation of the Technology Mission of Horticulture since 2001-2002 to 2007-2008 has helped in bringing in area coverage of 25347.5 ha under various Horticulture crops in all the districts of Meghalaya. Of this, fruits contributed 10220.5 ha, vegetables 4685 ha, spices 3454 ha, floriculture 4923 ha, plantation crops (cashew, coconut and arecanut) 1690 ha, medicinal 240 ha and aromatic plants 135 ha.

Besides this, infrastructure facilities such as 345 community tanks, 512 tube wells were installed to create irrigation sources. Under On Farm management, installation of 547 units of drip irrigation, construction 514 low cost green house and 484 Green house. It has further provided 376 sprinkler irrigation, 116929 sq m shade nets, 56 Hi tech Green house and 10 overhead tanks. 289 vermi compost units and 1415 earthworm units were developed for promoting organic farming.

For the production of planting material of various Horticulture crops, 44 big nurseries and 29 small nurseries were established under the public sector. Similarly under the private sector, 8 big nursery, 48 small nursery and 4 herbal gardens have been established.

Under the component Agricultural equipments, 2643 sets of manually operated, 504 sets of power tillers, 562 sets of diesel engine, 731 sets of power operated and 542 sets of electric pumpset were distributed among the farmers to help in the cultivation process of the Horticulture crops.

For pest control, 7306 ha of the Horticulture crops were adopted under the integrated pest management program. On farm handling component, 190 units were constructed.

Under Transfer of Technology, 5092 farmers/ officers including women farmers within state have been trained on various aspects of Horticulture. 2515 farmers outside the state have been trained and 54 Training of Trainers have taken place.

Findings and Observations

The Evaluation team observed that there was wide appreciation of the manner in which the Technology Mission Programme has been conceived and was being implemented in all the districts of Meghalaya. The overall impact of the Mission is also very much visible in terms of increased level of awareness about the role of Horticulture sector in the economy of the region. Though, a clear defined road map needs to be planned for the future to have a greater impact in the field of Horticulture sector. The observations and findings have been laid out as follows:

i. **Appropriate agro- climate:** Meghalaya is blessed with diverse agro climatic conditions that are conducive for cultivation of varied horticultural crops round the year. The varied agro-climate is ideal for growing large number of these Horticulture crops enabling their production and availability on a regular basis. Meghalaya holds a vast potential for the development of Horticulture.

ii. **Expansion of area:** There has been a substantial increase both in area and production of Horticulture crops during the Technology Mission on Horticulture. After launching of the TMH, additional area of 25347.5 ha of land has been brought under Horticulture crops, till 2008. Area expansion has taken place mostly in case of fruits, vegetables and spices. Among fruits the main benefited crops have been pineapple (2046 ha.), orange (2035 ha.), banana (1870 ha.), peach/ plum (1327 ha.), strawberry (570 ha.), indigenous fruits (330 ha.) and stone fruits (322 ha.) etc. Among vegetables 1000 ha land has been used for cultivation of cabbage, carrot, cauliflower, pea, tomato and broccoli. Colored capsicum has come under area expansion of 770 ha. potatoes (360 ha.), cherry tomato (200 ha.) etc. Among spices, ginger contributed 1188 ha. turmeric (1018 ha.) and black pepper (849 ha.). *Tezpatta*/Betelvine (205 ha.) and large cardamom (164 ha.) have also been encouraged. Floriculture has benefited in a couple of districts especially RiBhoi (1464 ha) followed by East Garo hills (1346 ha). An additional area of 1570 ha has been brought under carnation, 1460 ha under Anthurium and Rose (1355 ha.). Other flowers such as Bird of Paradise, Lilium and Heliconia have also been encouraged. In fact floriculture is a post Mission development in the Region. The additional area brought under various Horticulture crops is a direct impact of the support extended by TMH and as a result realizes high productivity level.

iii. **Increase in Production**: On an average, total production under TMH schemes per respondent compared to pre project (TMH) period has increased by 215% for Fruits followed by 178.66% for Floriculture, 157% for Spices & Medicinal plants, 106.33% for Vegetables, and 52.61% for organic farming. For Bee Keeping average honey production under TMH compared to pre project period has increased by 578.44%.

iv. **Focus on commercial cultivation**: The Technology Mission has made a significant change in the cropping pattern. It has brought about transformation in the production scenario where the indigenously grown fruits, vegetables and flowers are now being commercially cultivated. The region has made an impressive progress in vegetables, cultivation of second crop in a year after paddy, thus helping the growers to earn better returns from same unit area of land. Before the mission mode intervention, Horticulture production was largely of the nature of taking cash crops for supplementing farm income.

v. **Impact on Employment Generation:** The Mission's interventions were labour intensive right from the nursery stage to the selling point. These interventions have not only lead to increased productivity and better quality produce but have also generated considerable additional employment. It is estimated that employment has been created for 40% persons by the different phases of mission programmes since the inception of the Technology Mission. In addition to this direct employment, indirect employment is also being generated in secondary activities, e.g. transport, packaging, processing etc. The vegetable scenario has started giving quick seasonal economic returns to farmers. Commercial cultivation of flowers such as orchids, anthurium, lilium, roses etc has improved the economy of many farmers besides providing ample employment opportunities for many youth especially women.

vi. **Economic benefits**: The average annual income of all the 350 beneficiaries during Pre Project Period was reported to be Rs. 46,399.15. Out of 350 beneficiaries, only 282

beneficiaries were benefitted by the production output emerged out of the scheme utilization. The average Post Project income of these 282 beneficiaries was found to be Rs. 60,578.17.This showed a growth of 30.56% in the annual income of the beneficiaries during Post project over Pre project income.

vii. **Other benefits**: Besides income enhancements respondents were also benefited by (i) Collective marketing facilities through co-operatives/ farmer's groups/ SHGs (12.32% respondents), (ii) Transportation facilities (34.78%), (iii) Linkages with processing units (4.35%), (iv,) Participation of women for Horticulture Development (16.67%), (v) Access to Laboratories and IPM facilities (10.14%), and other benefits (24.74%).

viii. **Infrastructure facilities:** The infrastructure facilities created such as community water tanks, tube wells, drip irrigation, nurseries, greenhouses, model floriculture centre, vermi-compost units etc. have helped in production and supply of quality planting material and also improving production and productivity of Horticulture crops in the region. Infrastructure facilities were also created for improved post harvest management, marketing as well as processing of horticultural produce in almost all the districts. These activities have helped in improving the economy of a majority of the inhabitants of the region, mainly small and marginal farmers.

ix. **Assistance provided:** The assistance provided to the beneficiaries are both in the nature of cash and kind. In some cases for a particular component the respondents have received assistance both in cash and kind. Apart from these; regular monitoring and on farm trials, demonstrations and training have added much for the success of the TMH in this region. Cash assistances were given for most of 74 programme components of TMH. Cash assistances varied from Rs. 600/unit (Bee keeping) to Rs. 9 lakhs/unit (for Big nursery in public sector). Altogether 350 respondents received 403 numbers of cash assistances. Several respondents received cash assistances for more than one scheme. Altogether 365 number of scheme assistance was given in kind to 350 respondents.

x. **Monitoring:** As per Evaluation team's observation and information, Monitoring of the programme is done but in a very lackadaisical manner. The Implementing Agency should ensure that more frequent visits are made as visiting the field for spot verification etc. Monitoring by the implementing agency acts as an encouragement to the farmers where they can discuss their problems.

xi. **Capacity building through training and demonstration:** TMH interventions are accompanied with recent technologies and infrastructure, which can help in enhancing the quantity and quality improvement of various Horticulture crops in a commercialized and competitive way. Inorder to bring about a transformation in the production scenario, it is essential to make the farmers adopt the technologies set under the mission. Trainings on various issues have been organized for building the capacity of the farmers. Trainings as well as demonstrations have been carried out for beneficiaries within and outside the state. Trainings have been conducted on (1) Improvement of production technologies, (2) Improvement of crop protection technologies, (3) Training on bee-keeping, (4) Training on mushroom cultivation, (5) Training on a particular crop like: fruits, vegetables, flowers,

aromatic plants, medicinal, spices, plantation crops (cashew nut) etc., (6) Organic farming technologies, (7) Use of agriculture implements, (8) Training on processing or value addition, (9) Nursery Raising, (10) Training on women Self Help Groups.

xii. Similarly five types of field demonstrations were attended by the respondents. The demonstrations were conducted on (1) use of vermi compost, (2) new / improved crop technology, (3) poly house/green house & low cost tunnel technology, (4) Integrated pest management technology and (5) certification of organic farming. Altogether 203 respondents attended the demonstration programmes.

xiii. The effectiveness of Horticulture efforts has been increased through training and demonstrations organized for both the staff and farmers. The response portrayed is quite visible in terms of increased level of awareness about the importance of agricultural sector in the economy of the region.

Accrued benefits of the Respondents

Economic benefits: The average annual income of all the 350 beneficiaries during Pre Project Period was reported to be Rs. 46,399.15. Out of 350 beneficiaries, only 229 beneficiaries were benefitted by the production output emerged out of the scheme utilization. The average Post Project income of the 229 beneficiaries was found to be Rs. 60,578.17.This showed a growth of 30.56% in the annual income of the beneficiaries during Post project over Pre project income.

Other benefits: Besides income enhancements the respondents were also benefited by (i) Collective marketing facilities through co-operatives/ farmer's groups/ SHGs (12.32% respondents), (ii) Transportation facilities (34.78%), (iii) Linkages with processing units (4.35%), (iv,) Women's Development Interventions (16.67%), (v) Access to Laboratories and IPM facilities (10.14%), and other benefits (24.74%).

Impact of programmatic components and constraints

a. The schemes under area expansion covered Fruits, Floriculture, Plantation crops, vegetables, spices, medicinal and aromatic plants as sub schemes. A wide range of tropical, sub-tropical and temperate fruits, flowers, vegetables, roots & tuber crops, spices, plantation crops both indigenous and exotic were covered in all the districts of Meghalaya apart from other schemes covering use of plastic-culture, on farm water management, production of planting materials, transfer of technology and distribution of agriculture equipments.

b. The components as implemented in different district show impressive achievements. The rate of assistance provided for promotion of Horticulture crops i.e. for fruits, flower, root & tubers, vegetables, plantation crops, spices and medicinal crops was Rs.. 13000/- per hectare with the exception of Kiwi (@Rs. 11,250/-ha), Strawberry (@Rs. 7,500/-ha), Aromatic plants (@Rs.5,000/-ha) besides providing assistance for creation of infrastructural facilities for improving adaptability and productivity of the crops. The difference observed in the rate of assistance varied from Rs. 600/- under Bee keeping component (lowest) and Rs. 8 lakhs (highest) for establishing nursery for production of planting material. Assistance for big nursery to the private sector can be encouraged.

c. Although there was existence of traditional and regional cultivation practices of crops, but the cultivation was restricted to a small scale. With the intervention of the technology

mission, Floriculture, Fruit orchards, Plantations and vegetable cultivation have been done in large scales. Few case studies reflect the impact of TMH, which have been discussed in brief in this report.

d. District wise best practices also provide impact of individual component and the coverage of the area under that particular component. Some of such practices include the establishment of Centre of Excellence in East Khasi Hills and one at Ri-Bhoi districts, major covered areas under fruits, flower, vegetables and plantation crops.

e. The main objective of the TMH was holistic development of the Horticulture covering fruits, vegetables, spices, flowers, aromatic plants and plantation crops. The major constraints, which hamper the productivity of the crops, limit the types of assistance and critical inputs has left a large area of cultivable land unexplored due to non-uniformity in distribution pattern and other factors.

Sustainable measures adopted under TMH

A. Adopted sustainable measures

S.N.	Scheme	Sustainable Measures adopted
1	Fruits	▪ Centre of excellence also known as Horti-Hub for demonstration of all components. ▪ Training inside and outside the state ▪ Exposure visit in the temperate region and the nearby market ▪ Technical assistance ▪ Packaging and storage facilities ▪ Market linkage ▪ Financial assistance for agri-inputs and equipments on subsidized rates
2	Floriculture	▪ Dissemination of information through media and publication ▪ Demonstration in farmers field ▪ Packaging, storage and transportation of cut flowers ▪ Training inside and outside the state
3	Plantation Crops	▪ Technical assistance for crop production, IPM etc ▪ Market linkage ▪ Financial assistance for agri inputs and equipments on subsidized rate
4	Vegetables	▪ Centre of excellence also known as Horti-hub for demonstration of vegetable crop cultivation such as Red and Yellow Capsicum etc. ▪ Training inside and outside the state ▪ Technical assistance ▪ Market linkage ▪ Assistance for forewarning of pests and disease
5	Spices, Medicinal & Aromatic Crops	▪ Demonstration ▪ Technical assistance ▪ Training inside and outside the state

		▪ Processing and value addition through project
6	Use of Plastic-culture	▪ Financial assistance ▪ Exposure visit ▪ Training inside and outside the state ▪ Technical assistance ▪ Demonstration for cultivation of crops under controlled conditions
7	Creation of Water Sources	▪ Financial assistance ▪ Exposure visit Participation of farmers for maintenance
8	On Farm Water Management	▪ Ensuring demonstration in farmers fields as well as in poly-houses maintained by the department of Centre of Excellence, Horti-hubs or elsewhere. ▪ Technical assistance and Financial assistance
9	Production of Planting Materials	▪ Centre of excellence also known as Horti- hub for demonstration of all components. ▪ Technical assistance ▪ Creating Local Market ▪ Financial assistance for agri inputs and equipments on subsidized rate
10	Transfer of Technology	▪ Technology refinement and imparting training through on farm trials on farmers fields and training to extension functionaries ▪ Demonstration ▪ Exposure visit ▪ Workshops / Seminars etc.
11	Organic Farming	▪ Technical and financial support ▪ Training and Demonstration
12	Agriculture Equipments	▪ Financial assistance for agri inputs and equipments on subsidized rate ▪ Training and Demonstration
13	Bee Keeping	▪ Technical assistance ▪ Financial assistance on subsidized rate ▪ Assistance in kinds i.e. providing a set of Bee Hive and Bee colony
14	Farm handing units	▪ Construction cost ▪ Use as temporary collection and storage centre

Constraints

It is clear from the review of implementation of the TMH that there has been a substantial increase in area, production and productivity in major Horticulture crops leading to employment generation, since last plan periods. However, the gaps in the Horticulture development, in the state, have also been identified.

The following constraints have been identified during the study:

1. Time required

The TMH was launched in 2001-02 to address the issues of production, marketing and processing of Horticulture crops through MgSFAC, the implementing organization which has been mandated by the Dept. of Agriculture, Govt. of India to implement the mission programme. SFAC has contributed a lot in endorsing Horticulture crops in the state of Meghalaya. Still there is a need to go a long way in promoting the horticultural industry at a competitive edge. MgSFAC activities will definitely get organized gradually over the years. Only after this state level arrangement has functioned for a few years would it be possible for the state to decide what kind of a formal organization set up it would like to have at the district level to promote SFAC. It would, therefore be prudent to give some time for this state level arrangement to reaffirm itself in the promotion of Horticulture crops.

2. Maintenance of records

The Records were found to be maintained in a few offices but it still needs to be kept in a more systematic manner. Though it was reported that the records of the various DDOs were audited by Chartered Accountants as well as by the Accountant General from time to time, but in a few cases the records were found missing. Maintenance of records is equally important as documenting them. Vital records such as category wise posts sanctioned by the Government, production of nursery seedlings, income derived from the sale of seedlings and fruits, total quantity of chemical fertilizer and pesticides received from the competent authority etc also needs to be regularly maintained.

This study was conducted to assess the progress of the mission. However, records on earlier years were not maintained by some of the implementing agency. In the absence of such important records it was a herculean task for the evaluation team to make any systematic assessment of the progress of the Mission. Hence the team faced difficulty in working out accurate year-wise achievement. As such, the cumulative achievement right from its inception i.e. 2001- 2008 could not be assessed properly. Cash books, Stock books and distribution list were maintained by some implementing agencies only. Records on financial involvement such as land compensation, purchase of vehicles, purchase of tools and equipment, construction of various infrastructures etc. were not at all available to the Evaluation team. Thus proper analysis on financial target and achievement could not be attempted in this report. The department should in future ensure that proper records are maintained in all the activities of the mission.

3. Database & Market Intelligence

The MgSFAC is dependent on the data base generated by the Department of Agriculture, Govt. of Meghalaya. If MgSFAC initiates its own data base and market intelligence, it would give the programmes and project a boost. This should be given importance and should also be understood that an authentic and upto date statistical base is an essential pre-requisite for proper planning process for development of the Horticulture sector. Efforts should be made in making attempts to compile the data on area, production and productivity of some of the horticultural crops on a regular basis. More realistic planning would have been possible if actual data for all the years since the initiation of the TMH were made available. In the absence of this statistical information uniformly for all the years, the evaluation team had to face limitations to make realistic assessment of the actual needs of this sector. Unless the data base is made stronger and broader in its coverage, long-term planning for horticultural development will be difficult and unrealistic.

Furthermore, bench mark survey of all horticultural crops need to be conducted. The Mission should set up a market intelligence unit to provide market/ trade information to disseminate information related to the sector. There is an urgent need to develop and strengthen Horticulture database system for generation, documentation and dissemination of the information.

4. Training and exposure

As reported by the beneficiaries so far few trainings have been imparted in the Districts by the concerned Departments. Though time to time, training and exposure trips were conducted for the officers and farmers by taking them to HTC Pune and HTC Jaipur. The Evaluation team strongly felt that technical training/guidance should be given to the farmers time to time for proper knowledge and capacity building of the farmers involved in the programme. The amount of training needs to be substantially increased, such that all stakeholders having responsibility for horticultural crops should receive training each year.

5. Fencing of farm

The fencing should be emphasized more vigorously. Several respondents were found to be casual about the fencing and therefore faced the threat of damage due to cattle or other animals.

6. Marketing of the product

It was reported that, the farm could produce about 10,000 kgs. of different fruits in a year. Fruits being perishable item, unless they are sold at the right time, the fruits will perish within no time. But due to the non availability of market facilities and cold storage equipment for preservation of the fruits, most of the fruits were sold out in the local market at a throw away price and most of the unsold fruits either perished, eaten up by animals or stolen by the people. The concerned department should find ways and means for the disposal of all the products of the farm at the right time so that the production of the farm is fully utilized without wastage and also for earning more revenue to the State Government.

7. Inadequate processing infrastructure

A large quantity of different fruits, vegetables, cereals, and pulses are grown in the State but most of them are either consumed directly or exported to other regions. Due to inadequate processing infrastructure very less quantity of the total production is processed. If the processing facilities are improved, it would help in increase in farm income as well as employment in rural areas. The Mission should initiate steps for encouraging investment in food processing sector by rationalization of procedures, encouraging entrepreneurs, strengthening of food processing units in the State to focus on quality and brand building exercise.

8. Export potential

The evaluation has brought out the potential for development of Horticulture produce, particularly organically grown Horticulture produce, which can be sold in raw or processed form. Meghalaya is famous for oranges and some other crops such as Passion fruit, Kiwi, strawberry, large cardamom etc. which are grown only in this region of the country. These fruits have considerable export potential which is yet to be exploited. The demand for Floriculture has increased significantly.

Excellent marketing of Anthurium as cut flower has given a phenomenal impact to the farmers at the local level. There is also a huge scope for export of Anthurium to countries like Japan and Middle East. As reported from the districts of Ri Bhoi and Garo Hills, Anthurium was sent to

Japan and Dubai, but due to small scale production, it could not be carried forward. Proper planning and developmental efforts can be very flourishing for floriculture business enterprises in Meghalaya.

The North East region has also good scope for horizontal expansion as much unused land suitable for cultivation of different horticultural crops is available.

Recommendations & Suggestions

This Evaluation Report has analysed the present status of Horticulture in the hilly terrain and observed gaps and constraints in the implementation of the TMH programme. Based on the achievements, the gaps and lessons learnt during evaluation have rightly been identified. To overcome these gaps, a number of recommendations for action have been formulated by AISD. For proper implementation of the mission programme, it is suggested that the TMH should analyze the critical gaps, consider the recommendations proposed and take into account the interdependence of different challenges and points of entry.

1. Programme Coordination

Given the other recommendations of the TMH, many responsibilities for the Programme Coordination team have been identified. The TMH needs to re-consider how overall coordination and planning of horticultural development will be promoted. They need to decide how to best address these issues, whether through increasing administrative staff in the Programme Coordination team, providing management training for existing staff, and/or obtaining technical assistance. Various programme stakeholders need also to comply with management's procedural guidelines, i.e., regarding planning, budgeting, reporting, monitoring, etc.

2. Strategic Planning

The TMH Programme is broad and fairly ambitious. Nonetheless, development of Horticulture in Meghalaya is a long-term endeavor that will require at least 10-15 years of support. Therefore, more attention is needed for strategic planning, in terms of deciding on priorities for the remainder of the current programme and activities for the coming phases.

Therefore, the Evaluation team recommends that the TMH Programme Management conduct different phases of strategic planning workshop, to refocus the programme design, agree upon priority activities and outputs, and to develop a work plan and budget for the remaining years of the programme. The strategic planning workshop would help work on further development of indicators to monitor the programme's performance (achievement of outputs) and impacts (achievement of objectives).

3. Training and exposure

Horticulture is a technically challenging and complex field. Given the introduction of new techniques and limited exposure of the personnel, efforts must be made to provide additional assistance. To achieve this, technical assistance and training and other support is required for nursery operators. Training programme should be organized for farmers on pre and post harvest management.

Large number of farmers from all the districts of the state should be given exposure of Horticulture Development programmmes outside the state, so as to familiarize them with latest technologies being employed by other developed states. Similarly Farmers' training under the

mission is a key programme for ushering in Horticulture development in the region. Hence the farmers should be given ample opportunity to participate in training programs that will enhance their capacity and knowledge towards use of improved techniques in Horticulture.

The Evaluation team recommends that TMH should consider where it can best find such technical guidance that can provide technical training to its farmers. It may be possible for TMH to arrange capacity building programmes through SAMETI/ ATMA within the state. Other alternative is to find some expertise through other projects and programmes to provide some short-term technical guidance. If such technical guidance cannot be found in the team of implementing agency, then technical assistance should be recruited through private consulting firms, or capacity building professional consultants, whichever may be best suited to provide these services. The Mission should discuss whether such arrangement could be supported within the existing budget, or whether additional funds to procure assistance from the Dept. of Agriculture could be available.

4. Infrastructure facilities

The Mission has the potential to register commendable progress on the production front with the provision of more infrastructure creation in terms of nurseries, green houses, community tanks, tube wells and tissue culture labs. Besides enthusiasm of farmers, this will help serve as focal points for extension of recommended technology to a large number of farmers in identified production clusters and also provide forward linkages between production and marketing by setting up facilities for sorting, grading, packaging and making trading arrangements.

5. Monitoring and Evaluation

It is envisaged that the Technology Horticulture Mission will monitor all programmes in the area of Horticulture. It is recommended that adequately staffed and equipped Monitoring and Evaluation (M&E) unit should be set up in the Mission for taking up this responsibility on a systematic basis. The State Level Executive Committees should also be assisted by M&E Units for concurrent monitoring of the on-going programmes.

The programme needs to develop an adequate Monitoring and Evaluation system. This will facilitate the preparation of such internal reports that will act as an important source for evaluating activities time to time. Prior to entrusting any external agency for evaluation, the progress reports and internal evaluation reports need to be prepared and compiled by the programme management unit. Such monitoring and reporting will not only serve evaluation purposes, but also more importantly serve as an ongoing management tool.

There is also need for strengthening of district level implementation and monitoring functions.

It is suggested that in each district a Functional Committee may be set up for this purpose. Fresh graduates in various disciplines of agricultural sciences, agricultural economics etc. could be inducted on ad hoc basis for project implementation and also to obtain a feed back on problems and constraints faced by cultivators/entrepreneurs.

Besides, internal evaluation, arrangements also need to be made at the district level for third party monitoring and periodic evaluation to get un-biased feedback. Out-sourcing of this function to Consultants also needs to be considered.

6. Need for Improved Data Base

There is need for improving data base in the Horticulture sector for better programme administration. In view of staff constraints in the concerned departments at the State level, the TMH needs to hire technical graduates for collection of data on input use, area/production/productivity of Horticulture crops, consumption of Horticulture produce, estimation of market surpluses etc. These professionals may be located in the departments or outsourced to public institutes. The collection of data needs to be organised on uniform standardized lines across the States. Methodologies and guidelines for this purpose need to be laid down.

7. Corpus Fund

Since the Mission programme extends over a large gamut from production, post-harvest management marketing to processing, the need for funding of studies on different aspects/field problems, market research, R&D efforts and processing technology can arise at any point of time. There are chances where unfavorable climate change and such unforeseen or other contingent expenditure cannot be provided for in normal budgeting procedures. It is suggested that a Corpus Fund might be set up under a separate budget. Source of funding is crucial and it is suggested that a corpus of sufficient amount would be a must so that the recurring income arising out of the corpus could take care of activities of MgSFAC.

8. Incentives for Production

The endeavour of the Mission is to achieve productivity increase in traditional crops and introduce commercially high valued innovative crops which are in demand in international and domestic markets. The emphasis is also on improving quality of the raw produce so that it is open to processing for marketable value added products. The basic support needed is quality planting material for Horticulture crops. It is necessary to work out projections of planting material required for each crop and each variety on the basis of year-wise projections of area under the Strategic Plan. This will help provide extension and financial support to farmers.

9. Organic Farming

Another thrust area for the Mission is to promote organic farming for which the region has natural advantages. The region is known to use minimum fertilizers and pesticides. This weakness is proposed to be converted into strength through appropriate technology-based development and adoption of organic management of Horticulture development activities. Incentives should be given for organic farming for commercial crops such as ginger, pepper, turmeric, cardamom and other spices. Along with provision for production incentives, there is also the need for providing investments for certification and marketing of organic produce.

10. Irrigation Costs

The success of Horticulture takes into account cost of irrigation including provision of micro irrigation facilities. In the North East Region due to nature of terrain and geo-hydrological factors, the source of irrigation is often located at quite a distance from the producing area. In such cases there should be appropriate arrangements for including cost of lifting water and channeling it from the source to the cultivation/ producing area. Additional arrangements should be made for interior and hard to reach areas too.

11. Marketing

It was felt that MgSFAC should take up marketing as one of the major thrust areas. It should collect useful market intelligence and make it available to farmers and their organizations and enterprises. It should also help the farmers in obtaining marketing support from existing Government Schemes.

Improvement of local and export marketing of horticultural produce, medicinal and aromatic plants, and value-added products will require not only improvement of domestic markets, but also greater attention to domestic and export market information. It also needs improving linkages with all ongoing marketing efforts and collaborators. Marketing studies are needed to find viable markets for floriculture and medicinal plants.

The Mission should make adequate provision for market promotion measures through mass, print/electronic media and product awareness campaigns. Provisions also need to be made for collection of market intelligence. For this purpose the TMH should consider creating information hubs at the district level manned by professionals. Collection of information should be undertaken with the support of Information Technology wherever possible.

There is a greater need for efficient linkages between the producers and the consumers for expanding employment opportunities and increasing the rural income through better marketing of agricultural products.

12. Collection Centres

In each of the locations market collection centres needs to be put up with facilities for cleaning, grading and packaging. Collection centres will need to be set up for more organized and quicker transport of fresh produce to the wholesale/secondary market sites. These collection centres also need to be linked directly to small scale processing units which also need to be set up in each cluster of Horticulture grown areas.

13. Role of other organisations

There is also need for involvement of the other agencies in marketing and processing areas. These agencies such as TRIFED, NAFED etc. already have the required mandate to lend/ support to the Mission activities in these two subject areas. Besides this the existing allied agencies like ICAR, NHB, NRCO, NABARD, Cooperatives etc, and several nationally acclaimed organizations need to be involved more actively in the Missions programmes.

14. Research and Development

In view of lack of research support in critically important crops and programmes of Meghalaya, it is necessary for the State to establish Research Institutes for commercially grown Horticulture crops. These research institutes will help carry out basic research in consonance with locally associated problems and development requirements. At the national level, The Indian Council of Agricultural Research (ICAR) has been gradually building up research infrastructure for a wide variety of horticultural crops. The ICAR also provides funding support to several institutes through a large number of time-bound ad-hoc mission mode projects to solve specific problems as well as International collaborations and foreign aided projects to promote Horticulture research in certain specific areas. Systematic research efforts will lead to the development of improved varieties and hybrids, improved production and protection technologies for different

horticultural crops for varying agro-climatic regions and situations of the country as well as post harvest processing.

15. Commitment, Ownership and Sustainability

The Horticulture programme is highly relevant for the development of the region involved in the sector, the peripheral areas as well as the state on the whole. This in turn will remain a priority for national development for the years to come. The sector has been accorded high priority in almost all the Five Year Plans. The Ministry of Agriculture demonstrates a clear sense of "ownership" of this nationally executed programme. The TMH was favorably impressed by the personal commitment of the government staff and the farmers. The sustainability of activities is growing, as more farmers and others in the private sector become engaged in horticultural activities and enterprises. The human resource development efforts to build up staff capacities also are contributing to the long-term sustainability of efforts to develop the horticultural sector. To adequately develop Horticulture over the next 10-20 years in Meghalaya, considerable additional support will be needed, from the State as well as the Central Government, donors and private investors.

District wise Recommendations and Suggestions

Ri- Bhoi

- About 80% of the district falls in sub-tropical zone for Horticulture production. As a result subtropical crops such as pineapple, strawberry, ginger, turmeric, sweet potato, arecanut, vegetables and flowers should primarily be targeted for improvement in area coverage as well as productivity.
- As the district has second highest area of land under miscellaneous tree crops and groves, management of the groves can be promoted through cooperatives or SHGs with five to ten years lease term.
- Considering the location advantage, the districts that are located closer to the Guwahati Airport, should be developed as a hub of collection centers for Horticulture produce for the entire state. A series of cold storages needs to be set up at strategic locations along the national Highway.
- The model project on strawberry at Dewlieh, Umsning should widely be replicated and publicized as successful model. This can lead to shift towards sustainable mono-cropping of high value cash crops at larger scale through pro-active role of change agents (successful farmers).
- The Umsing- Nongpoh belt should be developed as hub of vegetable production and floriculture through extension of Horticulture services in the area on an intensive project mode.
- The district has displayed significant increase in production with respect to cole crop, carrot, radish, tomato and peas, along with increase in productivity of most vegetable crops for the period 2001-02 to 2005-06. This should be further encouraged through crop specific promotional activities and development interventions.

- The productivity of citrus fruits in the district is nearly double than the state average. The area under citrus crops is just two percent of total area of the same in Meghalaya. So there is immense scope of area expansion in the district. This can be achieved through focused area approach for citrus fruits.
- There is need for setting up of fruit processing unit in the district to cater to the demand from the external market.
- Similarly as the district leads in productivity of spices like turmeric and chilly but the area coverage is less, there is need for allocation of more funds towards area expansion of these crops. (2007-08)

East Khasi Hills

- The district has more than half of the total area of Meghalaya under temperate zone and is home to several traditional Horticulture products such as Khasi Mandarins etc. Considering this, the target crops should be a balanced mix of traditional as well as exotic temperate crops.
- The location advantage of the district as the administrative and transportation centre should be utilized for collection and dissemination of technical knowhow as well as physical and financial resources.
- The foray into successful cultivation of off seasonal vegetables like tomatoes in the district should be encouraged by grater allocation of resources such as poly houses.
- The widely acknowledged workmanship of the Horticulture farmers of the Shillong plateau especially potato should be encashed towards building up of pioneer Horticulture institution on cooperative model of Horticulture.
- During the period 2001-02 to 2004-05 the productivity of pineapple has decreased by 1367 kgs/ Ha though there has been small increase in area of 40 Ha. This calls for proper ascertaining of causes and designing of remedies for rejuvenation of orchards.

West Khasi Hills

- As the district possesses the best balance of temperate and sub tropical zone for Horticulture, equal importance should be given for promotion of tropical as well as temperate crops.
- As the district has maximum area in the state under the category of cultivable wasteland and fallow, it should be seen as the focus district for area expansion under Horticulture crops.
- As the road density of the district is one of the lowest in the state, traditional Horticulture crops with high shelf life such as pineapple, spices and sweet potato should be targeted in remote areas. On the other hand the high value exotic crops can be promoted in high altitude areas close to Shillong.

- As the district has the maximum area in the state under category of forest, pineapple cultivation should be encouraged on a wider scale to overcome the menace of Jhum cultivation.
- There should be higher allocation of funds for promotion of cultivation of fruits, spices, medicinal and aromatic plants in the district.

Jaintia Hills

- The district has greater part of the area under subtropical zone and small percentage of area under temperate zone. Crop mix for promotion of Horticulture should be fixed accordingly.
- The district has second largest area in the state under the category of cultivable waste land and fallow land other than the current fallow land. Juxtaposed with the location advantage and high productivity of traditional Horticulture crops, the district presents a unique opportunity for horticultural growth which can be achieved through crop specific focused interventions.
- The district is well connected with road network and Agartala. The Guwahati National Highway passes diagonally through it, so adequate storage facilities for Horticulture produce should be constructed strategically along the National Highway.
- Though the productivity of citrus fruits in the district is second highest in the state, its area continues to be low (Directorate of Horticulture 2004). This calls for focused approach towards expansion in area under these crops along with greater allocation of physical and financial resources for the development of the same.
- For the cultivation of spices especially Lakadong variety of turmeric, the Nongbah-Shangpung belt of the Jaintia Hills should be developed as organic spices production zone. A marketing hub of spices needs to be set up at the nearest collection centre.
- Though the district has the highest area under sweet potato, its productivity remains the lowest in the state (Directorate of Horticulture 2004). This calls for interventions for productivity enhancement in the district.
- Despite the high area of cultivable waste land and fallow land, the district has the lowest area under total fruit crops. This calls for sustained efforts towards area expansion under indigenous as well as exotic fruit crops.

East Garo district

- Though the district ranks second in productivity of total fruit crops, the total area remains low. As larger parts of the district lies in tropical zone, this calls for area expansion of traditional crops such as Banana, papaya, arecanut and citrus fruits.
- As the district provides the sole entry and exit points for the entire Garo Hills its location advantage and good connectivity should be encashed by setting up of regional collection, storage and marketing centre through setting up of adequate infrastructure.

- Though the district has maximum area under cultivation of ginger, its productivity is reported to be the lowest (2005). This demands focused intervention for enhancement of productivity technological interventions.
- The district provides ample potential for cultivation of anthurium. The Model Pilot project on Anthurium located at Samgong Horticulture Farm, Williamnagar, needs to be scaled up through greater allocation of resources for setting up of shade houses and drip irrigation
- Farmers growing anthurium besides being linked through public private partnership should be organized on cooperative model.
- Cultivation of off season as well as exotic vegetables should to be expanded by organizing growers' interest groups.
- More number of Horticulture Orchards cum nurseries should be set up in the district.

West Garo district

- On one hand the area of fallow plus cultivable wasteland of the district is second highest in state and on the other hand maximum area in the district falls under tropical zone category. Hence the interventions need to be designed towards increase in productivity as well as area expansion of crops such as pineapple, citrus fruits and banana.
- The district has highest productivity as well as area under banana cultivation in the entire state of Meghalaya. This indicates towards channelization of efforts for further development of the crop through technological inputs such as tissue culture.
- The district presents the unique tradition of cultivation of spices such as L. cardamom, bay leaf, cinnamon and black pepper which should be targeted for area expansion through greater allocation of physical and financial resources. A centre for excellence for cultivation of spices needs to be set up in the district.
- The district is the leader in arecanut cultivation and ranks second in production of cashewnut and tea. As a result efforts should be made towards setting up of collection centre and marketing hub of these crops in the district.
- Though the district has highest area under cultivation of chillies its productivity remains lower than the state average. This needs interventions targeting productivity enhancement through induced change in practices at the community level.

South Garo district

- South Garo is the smallest and one of the most remote districts of Meghalaya. With about 55% area under category of forest the district ranks highest in the state in terms of forest cover. The combination of physical and ecological aspects makes it a potential area for development of Horticulture based organic farming of crops such as black pepper, cashewnut, arecanut, coconut, orange, papaya, litchi, grapefruit and tubers.
- Considering the existing area under cropping and high potential of growing different types of plantation crops in the district, a district level collection and processing centre may be set up along with more number of Horticulture farms and nursery at local level.

- Considering the remoteness of the district, greater allocation of resources for the promotion of Horticulture farming at community level needs to be undertaken.
- The productivity of tuber crops is among the highest in the state but their area of cropping remains less than 0.5% of the total in Meghalaya. Considering this fact the development of these crops needs to be undertaken in a project mode. Setting up of cold storage is required for the development of these crops in the district.
- Considering the decline in productivity of pineapple, citrus fruits and papaya for the period 2001-02 to 2004-05, better interventions needs to be designed for these crops.
- Considering the decline in allocation of resources for the development of spices, medicinal and aromatic crops since 2001-08, fresh impetus is needed for better planning towards development of these crops in the district.

Financial

Horticulture and Floriculture hold immense potential in terms of high value addition to the farmers. The constraining factors include high cost of cultivation, transportation and marketing. With the financial help of SFAC, the economic status of the farmers will be further strengthened and export promotion will be facilitated. To bear the transportation cost, Transport subsidy should be provided to the beneficiaries.

The high capital cost involved in establishing an orchard/ a plantation, or rejuvenation of existing old unproductive plantation poses serious constraint in area expansion under these crops. The situation becomes all the more difficult in view of the large number of small holdings devoted to these crops which are essentially owned by weaker section, who have no means to invest, nor can afford to stand the burden of credit even if available. Besides this, is the long growth period of the horticultural crops like mango, orange, apple and plantation crops like coconut, arecanut, cashewnut, etc.

All these factors necessitate the provision for easy going credit facilities in easy installments for repayment of loans to small and marginal farmers. High cost of inputs and lack of enough incentives for production of quality varieties /species, product diversification, value addition, etc. also hinder crops development.

SFAC should utilize funds as per provision of the scheme and send regular progress report and utilization certificate to the Technology Mission Cell in the prescribed format. SFAC should also get its accounts audited at the end of each financial year, by the authorized Chartered Accountants and state level agency like the Accountant General.

Conclusion

It is clear from a cursory enumeration of constraints and opportunities that at both the levels i.e. the state and district will need to discharge their respective functions in a symbiotic manner if the SFAC initiative is to take roots and blossom. Despite the numerous challenges, there is also a need to join efforts and resources in a true and practical PPP structure to address these challenges. Most importantly, there is also a need to engage the positive mindsets/attitude and help others especially small holder and marginal farmers to have “business oriented mindset” which will position the horticultural industry at a competitive edge. The success of the mission programme lies on how the entire stakeholders perform collaboratively with a common purpose.

CHAPTER I
Introduction

1.1 Introduction

The implementation of Technology Mission of Horticulture Development in Meghalaya was carried by the Department of Horticulture, Government of Meghalaya, in seven districts since 2000. To assess the impact of Technology Mission of Horticulture in Meghalaya, the Programme Implementation & Evaluation Department, Government of Meghalaya, entrusted **Asian Institute for Sustainable Development (AISD)**, Ranchi, as an independent agency to conduct the survey and to prepare a report on the basis of the field findings.

1.2 Technology Mission of Horticulture in Meghalaya

The Technology Mission for the Integrated Development of Horticulture in Meghalaya was launched during the year 2001-02, aims at achieving convergence and building synergy among numerous ongoing schemes through vertical and horizontal integration of the existing programmes and bridging gaps through appropriate new programmes, to ensure adequate, appropriate, timely and concurrent attention to all the links in production, post-harvest and consumption chain. In pursuit of this, the existing schemes of the DAC, which have been operating for the development of agriculture but have relevance for horticulture, have been covered. Schemes like National Watershed Development, Integrated Insects-pests Management and control of Diseases, scheme of Bio-fertilizers etc. are being integrated and the existing pattern of assistance provided through the scheme will now focus on horticulture. Further, the existing schemes of DAC, DFPI, ICAR, NHB, DMI, APEDA, NCDC etc., which are directly concerned, with the development of horticulture will become part of this Technology Mission.

The Department of Agriculture & Cooperation undertook wide-ranging consultations with each of the States of the North-Eastern Region before working out the proposal. Various components of the proposal have also been discussed in an inter-ministerial meeting. Based on these consultations, the Technology Mission has been conceived. The horticulture sector, which includes fruits, vegetables, spices, plantation crops, floriculture, medicinal and aromatic plants, cashew nut, etc. have ample potentials for development, as compared to other crops, in the North Eastern (NE) Region (Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim) in view of the diverse agro-climatic condition, varied soil type and abundance of rainfall, which has remained unexploited. Various Commissions and Committees have examined the development of NE region, such as, S.P. Shukla Commission set up by the Planning Commission and M. S. Swaminathan Committee set up by the Ministry of Agriculture. These committees have recommended that integrated development of horticulture in a mission mode approach would foster rapid growth of the region. Accordingly, launching of Technology Mission for Integrated Development of Horticulture in North Eastern region including Sikkim was announced by Prime Minister in a meeting with Chief Ministers of North Eastern states held on January 21-22, 2000 at Shillong.

The Goals of the Mission are:

- To establish convergence and synergy among numerous ongoing governmental programme in the field of horticulture development to achieve horizontal and vertical integration of these programmes to ensure adequate, appropriate, timely and concurrent attention to all the links in the production, post harvest and consumption chain.
- To maximize economic, ecological and social benefits from the existing investment and infrastructure erected for the horticulture development.
- To promote ecologically sustainable intensification, economically desirable diversification and skilled employment to generate value addition.
- To facilitate and promote the development and dissemination of eco-technologies based on the blending of the traditional wisdom and technology with frontier knowledge such as biotechnology, information technology and space technology.
- To provide the missing links in ongoing horticulture development projects.

The specific objectives of the Technology Mission of Horticulture are:

1. To improve productivity and quality of horticulture crops through up gradation of production/farming technologies.
2. To reduce post-harvest losses, and improve marketability of the produce and its availability to consumers.
3. To promote better utilization and increased consumption of the produce to ensure higher returns to farmers/producers and better nutritional health to the people.
4. To promote export.
5. To develop a strong base for transfer of technology and human resource development to support the developmental activities.

The Mission has a structure of four mini-missions i.e. Research, Production and Productivity, Post Harvest Management, Marketing and Export; and Processing. The Nodal agency for Mini Mission-I was the Indian Council of Agricultural Research (ICAR) and for Mini Mission-II and III the Department of Agriculture and Cooperation (DAC). The Department of Food Processing Industry (DFPI) was the Nodal agency for Mini Mission-IV.

1.3 Impact Study

Every project needs a midterm evaluation in order to understand the level of achievements and the difficulties as well. The appraisal of such projects highly depends on the midterm evaluation report. Since the Technology Mission of Horticulture has completed nearly 8 years of its functioning and therefore, the Programme implementation & Evaluation Department, Government of Meghalaya, felt the need of conducting an impact evaluation study by an external evaluator. Thus the department engaged Asian Institute for Sustainable Development (AISD), Ranchi, as an external evaluating agency.

The purpose of the Evaluation Study was to assess the performance, processes of implementation, effectiveness of the delivery systems and impacts of programme / scheme. The study needs to be diagnostic in nature and aims at identifying the factors contributing to successes and/or failures of the programme and thus help in deriving lessons for improving the

performance of existing scheme(s) through mid-course corrections and better designs for future programmes. Thus, designing of schedules and questionnaires were to be carried out in consultation with the State Programme Implementation and Evaluation department.

1.4 Objectives of Impact study

The Department of Programme Implementation and Evaluation plays a vital role in providing feedback information to the policy makers and planners in the State on the actual performance and impact of the different developmental Schemes/Programmes/Projects being implemented by various departments throughout the State through Monitoring and Evaluation Studies it undertakes from time to time and thereby plays an important role in the planning process of the State.

To increase the reach and efficacy of the Programme Implementation and Evaluation Department in future, it has been decided to involve independent, external agencies of repute in the evaluation and monitoring process. The Programme Implementation and Evaluation Department, which would lay down norms for them, provide handholding support and work with them towards achieving the objectives would pay for their services. The Programme Implementation and Evaluation Department would thereafter monitor and track follow up action as well as liaise with the departments/ line agencies concerned.

To measure the impact created through the Technology Mission of Horticulture Department in Meghalaya, the following objectives were kept in perspective:

1. To see the progress of the project implementation in accordance with the project objectives.
2. To verify the fund utilization pattern
3. To assess the incidence of benefits being received by the beneficiaries of the project.
4. To identify the programmatic interventions or components, those can cause greater beneficial impact to the beneficiaries.
5. To evaluate the measures those are taken for project sustainability.
6. To identify the constraints being faced by executing agency in Programme implementation.

1.5 Methodology

The study employed multi-pronged methods to collect and collate various streams of data. Primarily two kinds of data were collected viz. primary and secondary. Methods for collecting primary data included structured questionnaire, Focussed Group Discussion (FGD), and Key Informant Interview for case study. Secondary data were collected through District and Block Horticulture offices records, other relevant data and information available with District Collector office staff.

Structured Questionnaires: One set of structured questionnaire was prepared for the beneficiary i.e. one household questionnaire. Questions were prepared on the basis of pilot study.

Focussed Group Discussion (FGD): FGD was conducted with group of 8-10 beneficiaries. Questions were open ended and each participant was allowed to give his or her own opinion and consensus/ answer which was noted down.

Key informant interview: Key government functionaries, local leaders, development workers and concerned company personnel were also interviewed to develop realistic development strategy for tapping government resources as well as resources available from other sources.

1.5.1 Survey Tools

The evaluation team used multi pronged tools for carrying out the survey.

i. Desk Review and Analysis of Books of Record
ii. Semi structured interview schedule for discussion with DHO and District Collector Office functionaries
iii. Focussed group discussion with beneficiaries

1.5.2 Sample Profile

The survey was conducted in all the seven (7) districts of Meghalaya. One (1) block per district was chosen randomly and further 10 programme units per block were selected randomly. Therefore, a total of 70 programme units were covered in this study. 70 programme units were spread in 70 villages.

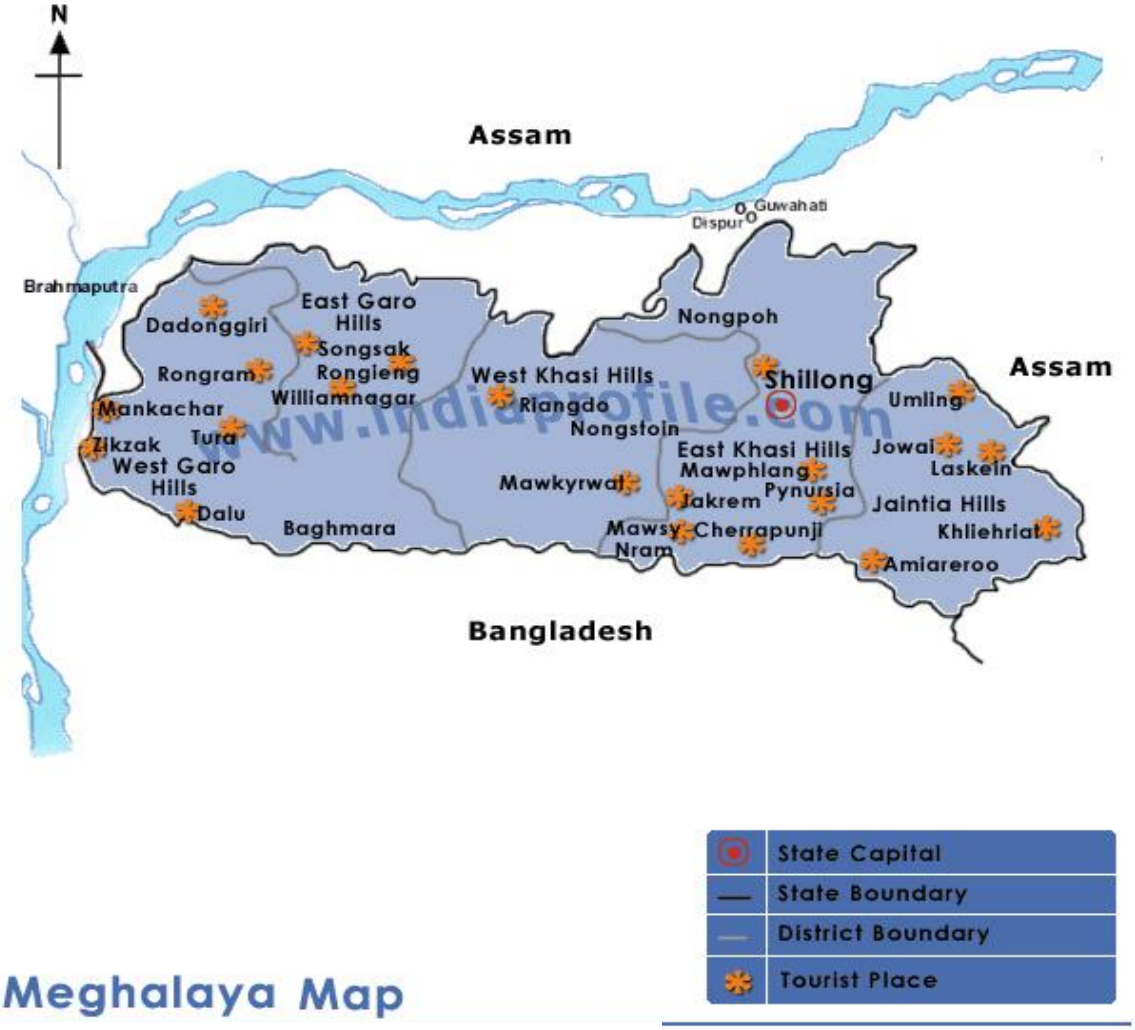


Fig 1.1 State Map of Meghalaya

Fig 1.2 Map of seven districts of Meghalaya State

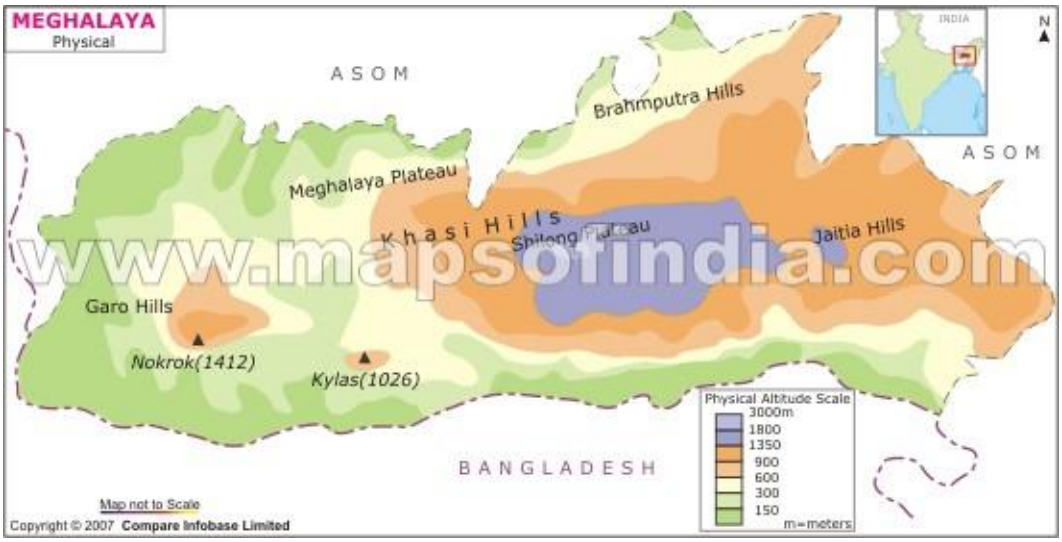


Fig 1.3 Physical map of Meghalaya showing Tropical (100-300m), Sub- tropical (300-1100) and Temperate (1100-2000) Agro- climatic Zones

Table 1.1 Description of the sample profile covered under the study

S.N.	Sample Type	Number	Total
1.	District	Seven districts	7
2.	Blocks	One Block per District	7
3.	Programme units per Block	10 Programme unit per Block	70
4	Beneficiary	Individual Beneficiaries	350
5	FGD with Beneficiaries	1 FGD in each block	7
6	Case study	8 Case study	8

FGD- Focus Group Discussion

1.5.3 Process of Data Collection

Two professionals from AISD were involved in collating data in the field. The field level staffs from the respective Horticulture Department in each blocks supported AISD in organizing the meetings. Nine (9) local graduates having adequate experience of such surveys from various districts were hired to conduct the interviews with beneficiaries and non beneficiaries. The entire survey was carried out with the help of the local investigators to avoid language problem, the field level staffs assisted in translation during the FGDs to bridge the communication gap. Pilot

Study and pre testing of survey tools were conducted in the month of February and March. The actual survey work began from February 24 to March 22, 2009 in all the seven Districts of Meghalaya State.

The draft report on "Evaluation of TMH in Meghalaya" was presented before the State Evaluation Committee, Govt. of Meghalaya, at Shillong on November 25, 2009. It was brought to the notice of AISD team, by the PI & E department, that some of the figures related with the implementation of specific schemes viz. floriculture, poly house installation etc. in particular districts did not match with the official records of the state. Therefore, the Programme Implementation & Evaluation department requested AISD to conduct a revision study to verify the official records with the Directorate of Horticulture and with District Horticulture Offices in Meghalaya. During March 2 – 17, 2010, the AISD team visited East Khasi Hills, West Khasi Hills, Jaintia Hills, Ri Bhoi, East Garo Hills and West Garo Hills districts to verify the secondary informations once again and for physical verification of the particular schemes with 20 beneficiaries.

Further, a detailed discussion was held with the Principal Secretary & Agriculture Production Commissioner, Commissioner & Secretary, Director of Horticulture and all the DHOs of their respective districts to verify the official figures for all the schemes under TM. The suggestions received in the final presentation were incorporated in the report in form of separate chapter on case studies, presentation of specific data on increase of productivity, district wise recommendations for horticultural development, highlighting of good points that emerged from each project and indication of crop wise financial targets and achievement.

1.6 Organization of the Report

This report consist of six chapters including the existing introduction chapter as chapter one. The structure of the report is as follows:

Chapter 1:	Introduction
Chapter 2:	Meghalaya and Technology Mission of Horticulture
Chapter 3:	Assessment of Project Implementation in Districts
Chapter 4:	Incidence of Benefits for the Beneficiaries
Chapter 5:	Impact of Programmatic Components, Constraints and Recommendations
Chapter 6:	Assessment of Programme Sustainability of TMH
Chapter 7:	Case studies under TMH
Annexure I:	List of Beneficiaries (Name, Sex, Age, Village, Block and District)
Annexure II:	List of Beneficiaries (Types of Benefit Received under Schemes)
Annexure III:	Physical Achievements under TMH (MM II) in Meghalaya

CHAPTER II

Meghalaya and Technology Mission of Horticulture

2.1 Introduction

This chapter entails the description of Meghalaya state along with Technology Mission of Horticulture's interventions in the seven districts of the state. The Technology Mission of Horticulture has provisions of entire development of the farmers by various mini missions having different project components. These provisions are responsible for development of the defined geographic area and will be required to contribute to the socio-economic development of the areas contiguous to its area of operation.

These provisions make it essential to include a state profile along with district wise implementation of the various mission components. The following chapter tries to draw the bird's eye view of the area and thus identify development issues that can then be taken care of by the Technology Mission of Horticulture department in the near future.

2.2 State Profile

2.2.1 Meghalaya

Meghalaya "**The Abode of Clouds**" was originally part of Assam and was inaugurated as an autonomous state on April 2, 1970 and declared a full-fledged State on January 21, 1972. **Meghalaya** is one of three states in India to have a Christian majority; the other two (Nagaland and Mizoram) are also in the north-east of India.

The total geographical area of the State is 22,429 square kilometer. The State is now divided into seven administrative districts. They are (1) Jaintia Hills District, created on February 22, 1972. (2) East Garo Hills District and (3) West Garo Hills District created on October 22, 1976. (4) East Khasi Hills District and (5) West Khasi Hills District created on October 28,1976. (6) Ri Bhoi District created on June 4, 1992 and (7) South Garo Hills District created on June 18, 1992. The Khasis, the Jaintias and the Garos predominantly inhabit them. These tribal communities are the descendents of very ancient people having distinctive traits and ethnic origins.

Meghalaya's capital, Shillong and also the district headquarters of East Khasi Hills District is situated at an altitude of 1,496 meters above sea level. The capital city has a bracing climate throughout the year. It is also known as 'the Scotland of the East'. The capital city derives its name from the manifestation of the creator called Shillong. This city has been the seat of Government since the consolidation of the British administration in this part of India, over a century ago. It has 60 seats of legislative assembly. Two members and one member in the Rajya Sabha represent the state in the Lok Sabha.

2.2.2 Geography

Tucked away in the hills of eastern sub-Himalayas is Meghalaya, one of the most beautiful states in the country. Nature has blessed her with abundant rainfall, sun-shine, virgin forests, high plateaus, tumbling waterfalls, crystal clear rivers, meandering streamlets and above all with sturdy, intelligent and hospitable people.

Sardar Vallabhai Patel once said about state of Meghalaya that, **"Your land is land for Gods to live in. Its air, its natural scenery, it's pure atmosphere, its sweet water would attract even Gods".**

The State of Meghalaya is situated on the north east of India. It extends for about 300 kilometers in length and about 100 kilometers in breadth. Goalpara, Kamrup and Nowgong districts, on the east by Karbi Anglong and North Cachar Hills districts, all of Assam, and on the south and west by Bangladesh, bound it on the north. Meghalaya lies between 20.1 'N and 26.5 latitude and 85.49'E and 92.52"E longitude. The total area of the state is 22,429 Sq. Km.

2.2.3 Climate

Meghalaya is subject to vagaries of the monsoon. The climate varies with altitude. The climate of Khasi and Jaintia Hills is uniquely pleasant and bracing. It is neither too warm in summer nor too cold in winter, but over the plains of Garo Hills, the climate is warm and humid, except in winter. The Meghalayan sky seldom remains free of clouds. The average annual rainfall is about 2600 mm over western Meghalaya, between 2500 to 3000 mm over northern Meghalaya and about 4000 mm over south eastern Meghalaya. There is a great variation of rainfall over central and southern Meghalaya. At Sohra (Cherrapunji), the average annual rainfall is as high as 1200 centimeters, but Shillong located at a distance of about fifty kilometers from Sohra receives an average of 2200 mm of rainfall annually. The highest point is known as "Shillong Peak, which is 1965 meter above the sea level.

Thus the climate of this State is cool, bracing all year through maximum temperature 25°C and minimum 1° or 2°C.

2.2.4 Ethnic Compositions

Meghalaya is the homeland mainly of the Khasis, the Jaintias and the Garos. The Garos inhabit western Meghalaya, the Khasis in central Meghalaya, and the Jaintias in eastern Meghalaya. The Khasi, Jaintia, Bhoi, War, collectively known as the *Hynniewtrep* people predominantly inhabit the districts East of Meghalaya, also known to be one of the earliest ethnic group of settlers in the Indian sub-continent, belonging to the Proto Austroloid Monkhmer race. The Garo Hills is predominantly inhabited by the Garos, belonging to the Bodo family of the Tibeto-Burman race, said to have migrated from Tibet. The Garos prefer to call themselves as *Achiks* and the land they inhabit, as the *Achik*-land.

The majority of the population here has converted to Christianity, while non-Christians continue to worship, and practice old cultural beliefs. Colourful dances and festivals of the tribals, vary according to the region and tribe to which they belong.

a. Festivals of Meghalaya

Wangala (or dance of hundred drums) festival is an important event of the Garos. This festival marks the end of a period of toil, heralding a yield of good harvest. It is performed in honour of '*Satyong'*, the God of fertility. People, young and old, dressed in their colourful costumes and feathered headdress, dance to the beat of long cylindrical drums. Held annually in November, the festival lasts for a week.

Nongkrem dance is a religious festival marked by thanksgiving to Almighty God for good harvest, peace, and prosperity of the community. It is held annually during October/November at Smit, the capital of the Khyrim Syiemship near Shillong. Men and women, both married and

unmarried, perform the dance in the open. The women dressed in expensive silk costumes with heavy gold, silver, and coral ornaments dance in the inner circle of the arena. The men form an outer circle and dance to the accompaniment of music of flutes and drums.

An important feature of the festival is the '*Pomblang'* or goat sacrifice offered by the subjects to the Syiem of Khyrim, the administrative head of the Hima (Khasi state). Ka Syiem Sad, the eldest sister of the king, is the chief priest and caretaker of all ceremonies. The festival is conducted along with the *Myntries* (ministers), priests, and high priest where offerings are made to ancestors of the ruling clan and the deity of Shillong. One of the most important festivals of the Khasis is *Ka Shad Suk Mynsiem* (or dance of the joyful heart). It is an annual thanksgiving dance held in Shillong in April. Men and women, dressed in traditional fineries, dance to the accompaniment of drums and the flute. The festival lasts for three days.

b. Costumes of Meghalaya

The three major tribes of Meghalaya have distinct costumes and jewelry. The traditional costume of this place is the '*Jainsem'* and the '*Dhara'*, though the younger generation has now taken to Western clothes.

2.2.5 Political

The State is divided into seven administrative districts. They are (1) Jaintia Hills District, created on February 22, 1972. (2) East Garo Hills District and (3) West Garo Hills District created on October 22, 1976. (4) East Khasi Hills District and (5) West Khasi Hills District created on October 28,1976. (6) Ri Bhoi District created on June 4, 1992 and (7) South Garo Hills District created on June 18, 1992.

The capital city Shillong derives its name from the manifestation of the creator called Shyllong. This city has been the seat of Government since the consolidation of the British administration in this part of India, over a century ago. It has 60 seats of legislative assembly. Two members and one member in the Rajya Sabha represent the state in the Lok Sabha.

2.2.6 Economy

Agriculture is the main occupation of Meghalaya, with eighty three percent of the total population, dependent on it for their livelihood. Rice and maize are the major food crops. Important fruits grown here are orange, pineapple, pears, lemon, guava, jackfruit and bananas, while potato, jute, mesta, cotton, areca nut, ginger, turmeric, betel leaf, bay leaves, and black pepper are the chief commercial crops. *'Jhum'* or the shifting cultivation system is being replaced slowly with scientific methods, bringing land under permanent cultivation. Forest resources from pine and other timber products bring in the major chunk of state revenue. The state has many small-scale industries in furniture making, iron and steel fabrication, tyre rethreading and baking, Jute manufacturing, to name the principal ones. There are other mineral industries are also present here, that has vast potential due to states extensive deposits coal, limestone, granite, clay and other minerals.

2.2.7 Demography

According to the 2001 census the population of Meghalaya State is 23,18,822. The ST and SC population is 1.99 and 0.01 million respectively in the state. The literacy rate of the state is 59.6 percent. There are 7 districts and 10 subdivisions and 39 community development blocks. There

are total of 6180 villages in Meghalaya. The sex ratio rate is 972 per 1000 males. The population below poverty line is 33.87 percent. Female literacy rate is 59.6 percent.

Table 2.1 Demographic, Socio-economic profile of Meghalaya State

S. No.	Item	Meghalaya
1	Total population (Census 2001) (in millions)	2.32
2	Decadal Growth (Census 2001) (%)	30.65
3	Crude Birth Rate (SRS 2007)	24.4
4	Crude Death Rate (SRS 2007)	7.5
5	Total Fertility Rate (SRS 2007)	NA
6	Infant Mortality Rate (SRS 2007)	56
7	Maternal Mortality Ratio (SRS 2004 - 2006)	NA
8	Sex Ratio (Census 2001)	972
9	Population below Poverty line (%)	33.87
10	Schedule Caste population (in millions)	0.01
11	Schedule Tribe population (in millions)	1.99
12	Total Literacy rate (Census 2001) (%)	63.31
13	Male Literacy rate (Census 2001) (%)	65.43
14	Female Literacy Rate (Census 2001) (%)	59.6

Source: Census 2001

The urbanization rate of the districts is very poor. The least urbanization rate is among the new districts of Ri-Bhoi and South Garo Hills. Even Jaintia Hills has poor urbanization rate compared to other districts.

Table 2.2 Urbanization rate per district of Meghalaya state

S. No.	District	Urbanization Rate
1	East Khasi Hills	42.1
2	West Khasi Hills	11.4
3	Ri-Bhoi	6.8
4	Jaintia Hills	8.4
5	East Garo Hills	14.5
6	West Garo Hills	11.3
7	South Garo Hills	8.7
	Meghalaya	**19.6**

Source: Census 2001

2.2.8 Land Use

The land use and ownership varies from society to society depending on their cultures. The beliefs, traditions and taboos also determine the land utilization pattern in a region. However, spatial and temporal variations in physical environment, climate, soil conditions, topography (altitude and slope) and natural vegetation play a significant role in deciding the type of use a land is put under. For example, in Meghalaya the land on hill slopes is either covered by forests or has been brought under shifting agriculture, while settled agriculture is practiced on the plain lands in the valleys.

The lands available for agriculture include the current fallow land old fallow lands and the net sown area. The area under the current fallow land, old fallow land and the net area sown, has remained almost unchanged and accounts for about 3.0%, 7.3% and 9.7% of the total geographical area of the state respectively. The area sown more than once, gross sown area and cropping intensity has also remained more or less the same since 1997-99 accounting for about 2.0%, 11.7% and 0.0% of the total geographical area of the state respectively.

2.2.9 Land Ownership Patterns

The UNO report on progress in land reform (1970) has given the definition of ownership of land as "the right to use land, together with the right to transfer that right to others. Both of these rights are more or less circumscribed by national or local laws, so that the exact context of 'ownership' varies from society to society". The pattern of land ownership plays an important role in land use and agricultural planning. An understanding of the land ownership and related laws gives an insight into the problems faced by the society in implementing agricultural development and land use planning.

The form of land ownership and the accompanying laws in Meghalaya, are quite different from those in other parts of the country. Even in Meghalaya these differ from place to place and from tribe to tribe. Land ownership in Meghalaya is broadly of two types, viz. 1) *Riotwary,* and 2) Customary. The principle of *Riotwary* system is that the Government deals directly with the actual landholder without the intervention of intermediaries. Customary land tenure system is totally different from *Riotwary* system. In customary land tenure, the right to use or to dispose of use right over land depends on whether such rights have been recognized as legitimate or not by the community. The rules governing the transmission of these rights are usually explicit and generally known. The three important tribes of Meghalaya, viz. Garo, Khasi and Jaintia have different socio-economic traditions and accordingly, the land ownership pattern in the three tribes also varies considerably.

a. Ownership System among the Garos

In the Garo Hills, the *Riotwary* system is prevalent in the *mauzas* with plain lands, and the customary land tenure system is prevalent in the hill *mauzas*. The existing pattern of land ownership in the Garo Hills is related to the type of cultivation practiced in the area. Among the Garos, practicing shifting cultivation and private ownership is restricted. Everybody has the usufructory right on land, i.e., they have the right to use land without possessing the actual ownership. But with the introduction of wet-rice cultivation that makes private ownership of the land essential, private ownership is on the increase. In many cases private ownership is associated with permanent holdings. But unlike other peasant societies in the plains elsewhere in India, the Garos, even if they possess some sort of permanent holding, they cannot transfer it to outsiders (non-natives) if the holding, is a part of *Aabhang* land, i.e., the village territory under a Chief.

b. Ownership System among the Jaintias

In the Jaintia Hills, there is no rigid, uniform or regular ownership system worth the name. However, the land can be placed under the following categories (Lahiri, 1979). *Ri Kynti* or private land-Total area under this category is 7266 acres and they are known as "*Biniai*". *Rajland* - All *Rajlands* brought under wet-rice cultivation are subject to payment of annual revenue. The revenue is fixed according to the fertility of the soil. The total area of land under this category

the Jaintia hills district is 19709 acres. Land under *Zamindars*-In the border areas (War area) there are some big landholders locally known as *Zamindars*. There is no record of the number of such *Zamindars* or of the area of land held by them. Generally the *Zamindars* lease out their land on the basis of rent in cash or kind. In the Jaintia Hills, the *Doloi* elected from among the male members of the original clan or clans (*Kurs*) who were the earliest settlers in Raj land during the pre-British period had the power and authority to rant license and *patta* for cultivation of newly terraced wet-rice cultivation. This privilege remains with the *Doloi* even today. The individuals granted such new *patta* for their wet-rice cultivation have to pay a yearly fee to the *Doloi*. The *Doloi* and his deputies share such payments. In some villages where abundant forests for the *jhum* cultivation in the Raj lands are available, the village headman with the help of other village officials distributes the land to all the families and ensures that all get their due share. The *jhum* land is divided among the cultivators according to the ability of each family to cultivate (Gassah, 1980).

c. Ownership System among the Khasis

In the Khasi system there are many laws related to land and its ownership. Therefore, the classification of and ownership is extremely complicated (Haloi, 1984). The following four types of land ownerships have been identified in the Khasi Hills.

d. Private Land

The land over which the single owner or individual family enjoys all the rights at will and is not subjected to the control of any superior authority, is defined as private land. Bareh (1976) described that the owner of this type of land enjoys all the rights over the land. The owner can sell or buy it at will. No owner needs to pay any revenue to any authority. The Land Reforms Commission (1974) clarified that the State Assembly or any other Assembly has no control over the private land except with regard to the settlement of disputes as and when they are brought to the Assembly of the village. The *Ri Kynti* or private land system endows the *Ka-Khadduh* (youngest daughter) with absolute possession of land. If the parents of the family do not have any daughter, then the family brings a '*Ka Khadduh*' from the sister's family to the mother. In her absence, the family prefers a cousin's daughter from the mother's the side. Through *Pynbem* (a land distribution ceremony) land is distributed among the sisters of the family. The mother along with an uncle or a brother living in her house, or with her husband or alone may apportion the land among her children. In the case of her (mother's) death before apportioning the land, the *Ka-Khadduh* by herself cannot dispose off the property. The *Ka-Khadduh* as the custodian of the ancestral property is to be assisted by her elder sisters or brothers in its management. A purchased plot of land also becomes an ancestral property of the family just after one or two generations.

e. Group and Clan Land

The land, over which the owner's right, especially the transferable right, is subjected to the control of group-assembly, can be defined as group land. The group may consist of a branch of a clan or a group of clans. The members of each and every group are the owners of the land. Each and every group has its own Durbar (Assembly). As described by Chowdhari (1978), all members of the concerned group enjoy user right, occupancy right and heritable right at will over their land but no one is entitled to sell the land individually. According to the Land Reform Commission (1974), the right of transfer rests upon the decision of the concerned assembly or group

f. Community Land

The user or even by the community assembly cannot transfer community land, and all other rights pertaining to the land are subjected to the control of the community assembly. A community may consist of one clan or more than one clan. It may cover single village or many villages. Each and every member of the community can enjoy user-right, occupancy right, and sometimes even heritable right, but only after having the approval of the Raid-Durbar or community assembly. The Raid-Durbar has the authority of allocation and distribution of community land. However, Raid-Durbar cannot sell the community land. Community land is not heritable or transferable. Of course, exceptions are there. Roy (1934) explains the situation thus, if one fails to use and occupy the land after three consecutive fallow years, then the land automatically goes to the community assembly and the assembly allots user-right and occupancy-right to others. But if the occupant maintains its use, his descendents can inherit it (1974), but in no case can he enjoy the rights of transfer. According to the Land Reform Commission (1974), if one has made permanent improvement through the cultivation of permanent crops and by raising fruit trees or converting the land into wet paddy fields or by making permanent buildings etc., he may be endowed with transferable rights. Of course a person loses all rights if he leaves the plot or lets it become a jungle growth. The community assembly decides the period after which the property may be treated as having reverted back to the community.

2.2.10 Transport

The partition of the country has created severe infrastructure constraints for the Northeastern region, with merely 2% of the perimeter of the region adjoining the rest of the country. A narrow strip of land, often called the Siliguri Corridor, or the Chicken's Neck connects the region with the State of West Bengal. Meghalaya is a land locked state with a large number of small settlements in remote areas. Road is the only means of transport within the state. While the capital Shillong is relatively well connected, road connectivity in most other parts of the state is relatively poor. A significant portion of the roads in the state are still un-metalled. Most of the arrivals into the Meghalaya take place through Guwahati in neighbouring Assam, which is nearly 103 km away. Assam has a major railhead as well as an airport with regular train and air services to the rest of the country. The State still has a large number of old timber bridges.

Meghalaya does not have any railhead. It has a small airport at Umroi, about 40 km from Shillong on the Guwahati-Shillong highway. The small size of the airport does not allow the operations of large aircraft and only small aircraft operate from Kolkota and Agartala, capital of the neighboring state of Tripura.

2.2.11 Tourism

Earlier, foreign tourists required special permits to enter the areas that now constitute the state of Meghalaya. However, the restrictions were removed in 1955. Meghalaya is considered to be one of the most picturesque states in the country. It has enough tourism content to attract tourists of many different interests.

a. Tourism Content

Meghalaya has some of the thickest surviving forests in the country and therefore constitutes one of the most important ecotourism circuits in the country today. The Meghalayan subtropical

forests support a vast variety of flora and fauna. Meghalaya has 2 National Parks and 3 Wildlife Sanctuaries.

Meghalaya also offers many adventure tourism opportunities in the form of mountaineering, rock climbing, trekking and hiking, water sports etc. The state offers several trekking routes some of which also afford and opportunity to encounter some rare animals such as the slow loris, assorted deer and bear. The Umiam lake has a water sports complex with facilities such as rowboats, paddleboats, sailing boats, cruise-boats, water-scooters and speedboats.

Meghalaya has an estimated 500 natural limestone and sandstone caves spread over the entire state including five of longest and deepest caves in the sub-continent. Some of these caves also have water channels running through them. Cavers from United Kingdom, Germany and US have been visiting Meghalaya for exploring these caves. Krem Um-Lawan in Jaintia hills and Tetengkol Balwakol in South Garo hills are the two longest caves in the sub-continent. Not many of these have however been developed or promoted adequately for

b. Important Tourist Spots

'Cherrapunjee', may well be regarded as one of the most popular tourist spots in North East of India. It lies to the south of the capital Shillong. The town is very well known and needs little publicity. A rather scenic, 50 kilometer long road, connects Cherrapunjee with Shillong.

The popular waterfalls in the state are the Elephant Falls, Shadthum Falls, Weinia falls, Bishop Falls, Nohkalikai Falls, Langshiang falls and Sweet Falls. The hot springs at Jakrem near Mawkyrwat are believed to have curative and medicinal properties.

Meghalaya also has many natural and manmade lakes. The Umiam Lake on the Guwahati-Shillong road is a major tourism attraction. Meghalaya several parks; Thangkharang Park, the Eco-park, the Botanical Garden and Lady Hydari to name a few. Dawki, which is located at about 96 kilometres from Shillong is the gateway to Bangladesh and affords a scenic view of some of the the tallest mountain ranges in Meghalaya.

2.3 District Features vis a vis Horticulture Development

Meghalaya currently has 7 districts. These are: East Garo Hills, East Khasi Hills, Jaintia Hills, Ri-Bhoi, South Garo Hills, West Garo Hills and the West Khasi Hills.

The **East Garo Hills** district was formed in 1976 and has a population of 247,555 as per the 2001 census. It covers an area of 2603 square kilometers. The District Headquarters are located at Williamnagar, earlier known as Simsangiri.

The **East Khasi Hills** district was carved out of the Khasi Hills on 28 October 1976. The district has covers an area of 2,748 square kilometers and has a population of 660,923 as per the 2001 census. The headquarters of East Khasi Hills are located in Shillong.

The **Jaintia Hills** district was created on 22nd February 1972. It has a total geographical area of 3819 square kilometers and a population of 295,692 as per the 2001 census. The district headquarters are located at Jowai. Jaintia Hills district is the largest producer of coal in the state. Coal mines can be seen all over the district.

The **Ri-Bhoi** district was formed by further division of East Khasi Hills district on 4th June 1992. It has an area of 2448 square kilometers. The total population of the district was 192,795 as per the 2001 census. The district headquarters are located at Nongpoh. It has a hilly terrain

and a large part of the area is covered with forests. The Ri-Bhoi district is famous for its pineapples and is the largest producer of pineapples in the state.

The **South Garo Hills** district came into existence on 18th June 1992 after the division of the West Garo Hills district. The total geographical area of the district is 1850 square kilometers. As per the 2001 census the district has a population of 99,100. The district headquarters are located at Baghmara.

The **West Garo Hills** district lies in the western part of the state and covers a geographical area of 3714 square kilometers. The population of the district is 515,813 as per the 2001 census. The district headquarters are located at Tura.

The **West Khasi Hills** district is the largest district in the state with a geographical area of 5247 square kilometers. The district was carved out of Khasi Hills District on 28th October 1976. The district headquarters are located at Nongstoin.

2.4 Implementation of Technology Mission of Horticulture

The development of NE region was examined by various Commissions and Committees, such as, S. P. Shukla Commission set up by the Planning Commission and M. S. Swaminathan Committee set up by the Ministry of Agriculture. These committees recommended that integrated development of horticulture in a mission mode approach would foster rapid growth of the region. Based on these recommendations a Centrally Sponsored Scheme on Technology Mission for Integrated Development of Horticulture in North Eastern region including Sikkim, approved by EFC and CCEA, has been launched from 2001-02. The Technology Mission for Integrated Development of Horticulture was launched in 2001-02 to address issues related to production and productivity, post harvest handling, marketing and processing of horticultural crops in the North Eastern states.

The Goals of the Mission was to establish convergence and synergy among numerous ongoing governmental programmes in the field of horticulture development to achieve horizontal and vertical integration of these programmes

- **to ensure** adequate, appropriate, timely and concurrent attention to all the links in the production, post-harvest management and consumption chain,
- **maximize** economic, ecological and social benefits from the existing investments and infrastructure created for horticulture development,
- **promote** ecologically sustainable intensification, economically desirable diversification and skilled employment to generate value addition,
- **promote** the development and dissemination of eco- technologies based on the blending of the traditional wisdom and technology with frontier knowledge such as bio-technology, information technology and space technology; and to provide the missing links in ongoing horticulture development projects.

Overall the Technology Mission has four mini-missions as shown below. The Four Mini-Missions of the scheme were to be implemented under the supervision and technical guidance of below mentioned coordinating agencies. Each coordinating agencies were to submit an action plan for the year indicating requirements of allocations to Technology Mission Cell in the month of January, in order to facilitate Mission-wise allocations of funds for the year.

Mini Mission III & IV are proposal based while Mini Mission –II is based on action plans prepared by State Horticulture Departments. In order to have proper linkage and coordination between various Mini Missions it was imperative that States should ensure that all the proposals in the preview of respective Mini Missions have approval of state level steering committee and the Director Horticulture/Nodal Officer of the mission in the state is aware of the projects/proposals before these are sent to nodal agencies for seeking release of funds.

In order to improve livelihood opportunities and bring prosperity to the North Eastern Region (NER) including Sikkim, Government of India has launch Technology Mission (TM) for integrated development of Horticulture. The Mission is based on the "end to end approach" taking into account the entire gamut of Horticulture development, with all the backward and forward linkages, in a holistic manner.

Table 2.3 Components of Technology Mission of Horticulture

Mini Mission-I	Research: Coordinated and implemented by ICAR.
Mini Mission-II	Production and Productivity: Coordinated by DAC and implemented by the Agriculture / Horticulture Departments of the States.
Mini Mission–III	Post-harvest management, marketing and export: Coordinated by DAC and implemented by NHB, DMI, NCDC, NAFED and APEDA.
Mini Mission-IV	Processing: Coordinated and implemented by MFPI.

2.3.1 Scheme –Assistance for Implementation of various Mini Missions and coverage

A. Component- wise Pattern of assistance approved for the scheme

a. Mini Mission I

1. Seed and planting material (Supply of nucleus/basic seed and planting material of Horticulture crops)
2. Technology standardization (Standardization of production and protection technologies in fruit, vegetable, spices and plantation crops , development of organic farming practices and eco- friendly integrated pest and disease management)
3. Technology refinement (Technology refinement and imparting training through on farm trials on farmers fields and training to extension functionaries.)

b. Mini Mission II

1. Area expansion
   Fruits, vegetables including root & tuber crops, spices, cashew nut and medicinal plants @ 50% of the cost limited to ₹ 13,000/- per ha. Aromatic plants @ 50% of the cost limited to ₹ 5,000/- per ha. Floriculture @ 50% of the cost limited to ₹ 13,000/- per unit of 0.2 ha. Modal Floriculture Centre @ ₹ 70.00 lakhs per centre. Integrated mushroom unit @ ₹ 50.00 lakhs per centre.

2. Creation of Water Sources: Community Tanks- ₹ 10.00 lakhs/ tank @ ₹ 1.00 lakh/ ha.
   Tubewells –@ 50% of cost limited to maximum of ₹ 12,500/- per tubewell

3. On farm water management: Existing scheme of "Horticulture Development through Plasticulture Intervention"- 50% of the cost limited to ₹ 28,500/-

4. Production of planting material
   Integrated multicrop nursery;
   Nursery - 50 % of the cost limited to ₹ 8.00 lakhs for big nursery and ₹ 3.00 lakh for small nursery in private and 100% cost limited to ₹ 18.00 lakh in public sector for big nursery and ₹ 3.00 lakh for small nursery. Progeny and herbal gardens ₹ 3.00 lakh for public sector and ₹ 1.50 lakh for private sector.
   Tissue culture- 50% of the cost limited to ₹ 10.00 lakhs for Private/NGO and100% of the cost limited to ₹ 21.00 lakhs Public
5. Transfer of technology Through training front line demonstration , publicity and training of trainers :
   Farmers Training- ₹ 1500/ farmer for 7 days;
   Training outside the state – ₹ 2500/farmer
   Training of trainers –Actual cost limited to ₹ 50,000 per trainee
   Supervisor Level Training centre – Supervisory-₹ 20.00 lakhs
   Gardener- ₹ 2.0 Lakhs
6. Organic farming
   Existing schemes of fertilizer division
   Earthworm multiplication farm- ₹ 30,000 per unit; Incentive for adopting organic farming-₹ 10000/ ha.
   Assistance for obtaining certification-90% of the cost limited to ₹ 5 lakhs for group of farmers
7. Promotion and Popularization of agriculture equipment's
   Training to farmers – ₹ 1,000/ farmer; Assistance for purchase of equipment's limited to ₹ 1500/- for manually operated, ₹ 5,000 for power operated, ₹ 45,000 for power tiller and ₹ 9,000 for diesel engine. Demonstration equipment
8. Pest management
   Setting up of Bio-control Labs. in 8 NE States @₹ 80.00 lakhs per Lab in public sector and 50% of cost in private sector upto maximum of ₹ 40.00 lakhs.
   Financial assistance of ₹ 1000/ha. For adoption of IPM(use of bio-pesticides, pheromones, etc.) covering an area of 11,600 ha
   Assistance for forewarning of pests and diseases @ ₹ 4.00 lakhs per unit per year
9. Plant health clinic: ₹ 20.00 lakhs for Govt/ PSU and ₹ 5.00 lakhs for private sector
10. Leaf analysis laboratory: ₹ 20.00 lakhs for Govt/ PSU and ₹ 5.00 lakhs for Private
11. Women development : 100% Govt. assistance as per the approved scheme of DAC "Women in Agriculture for North- eastern States".
12. Remote sensing : Project based, as per requirement
13 Emergent requirement : Project based, As per the requirement
14 Strengthening of horticulture infrastructure. Project based.
   Staff support for Monitoring cell in DAC and Directorate of Technology Mission; Strengthening of horticulture departments/ directorates through IT network; external evaluation, seminar and symposium and technical support.

c. Mini Mission III

1. Post harvest management (NHB)
2. Development and commercial horticulture through production and post harvest management – Back ended capital subsidy @ 20% of the total project cost maximum of ₹ 30.00 lakhs.
3. Capital investment subsidy for cold storage – Back ended subsidy @ 33.3% maximum of ₹ 60.00 lakhs
4. Technology development – 100%
5. Strengthening of nutritional status ₹ 250/minikit/family, ₹ 2,500 for zero energy cool chambers and ₹ 5,000 per school for demonstration
6. Marketing (Directorate of Marketing and inspection)
7. Wholesale market @ 50% of the project cost maximum of ₹ 50.00 lakhs
8. Rural primary market @50% of project cost maximum of 7.50 lakhs
9. Apni mandi's 50% maximum of 7.5 lakhs
10. Quality control through strengthening of laboratories 100% of project cost maximum 2.5lakhs
11. Alternate Marketing System -25% of the project cost maximum ₹ 60 lakhs

Mini Mission IV

1. Processing- DFPI
2. Promotion of new unit –Credit linked and back ended assistance of - 50%of cost maximum of ₹ 4.00 crores.
3. Up gradation and modernization of existing units - 50% of capital cost maximum one crore
4. Promotional activities – pattern of assistance not specified.

2.4.2 Growth of Technology Mission of Horticulture

The TMH implementation in Meghalaya has increased from 79296 hectare in 2001-02 to 104408 hectare during 2007-08. Net area coverage under TMH has increased by 25112 hectare during seven years with 4.5% annual growth rate.

Similarly by production of horticultural crops under TMH has increased from 448327 tonnes to 583921 tonnes. Net production under TMH has increased by 135594 tonnes during seven years with 4.3% growth rate. This showed that growth rate in area coverage under TMH were slightly higher than the production under TMH during the same period (Table 2.4 & 2.5).

Table 2.4 Implementation of TM of Horticulture in Year 2001-2002

Districts	East Khasi Hills	West Khasi Hills	Jaintia Hills	Ri-Bhoi	East Garo Hills	West Garo Hills	South Garo Hills	Total
Area (ha)	22827	12402	6599	5506	8997	16944	6021	79296
Production (Met. Tones)	144217	66713	25210	52641	63651	78155	17740	448327

Table 2.5 Implementation of TM of Horticulture in Year 2007-2008

Districts	East Khasi Hills	West Khasi Hills	Jaintia Hills	Ri-Bhoi	East Garo Hills	West Garo Hills	South Garo Hills	Total
Area (ha)	27946	17394	9758	8229	11327	19968	9786	104408
Production (Met. Tones)	173669	93405	37275	78669	80081	92052	28770	583921

Table 2.6 District wise THM implementation and its status

District	Mini Missions	Functional programs	Remarks
East Khasi Hills	MM I MM II MM III & MM IV	Functional Functional Functional	▪ Funded & Implemented by ICAR ▪ Implemented by Horticulture department through MgSFAC. ▪ Implementation by Min. of Food Proc, GoI
West Khasi Hills	MM I MM II MM III & MM IV	Functional Functional Functional	▪ Funded & Implemented by ICAR ▪ Implemented by Horticulture department through MgSFAC. ▪ Implementation by Min. of Food Proc, GoI
West Garo Hills	MM I MM II MM III & MM IV	Functional Functional Functional	▪ Funded & Implemented by ICAR ▪ Implemented by Horticulture department through MgSFAC. ▪ Implementation by Min. of Food Proc, GoI
East Garo Hills	MM I MM II MM III & MM IV	Functional Functional Functional	▪ Funded & Implemented by ICAR ▪ Implemented by Horticulture department through MgSFAC. ▪ Implementation by Min. of Food Proc, GoI
Jaintia Hills	MM I MM II MM III & MM IV	Functional Functional Functional	▪ Funded & Implemented by ICAR ▪ Implemented by Horticulture department through MgSFAC. ▪ Implementation by Min. of Food Proc, GoI
Ri- Bhoi	MM I MM II	Functional Functional	▪ Funded & Implemented by ICAR ▪ Implemented by Horticulture department through MgSFAC ▪
South Garo Hills	MM I MM II MM III & MM IV	Functional Functional Functional	▪ Funded & Implemented by ICAR ▪ Implemented by Horticulture department through MgSFAC. ▪ Implementation by Min. of Food Proc, GoI

* MM = Mini Mission

The status of TMH functioning in different districts is given in Table 2.6. In Table 2.7 the number of SHGs involved in TMH in different districts and the financial grant allocated to them during 2003-2004 are given. During 2003-2008, 1351 SHGs were involved in the state for the implementation of TMH and they were given ₹ 67.55 grant to pursue horticulture development in the state.

Table 2.7 District wise achievement of SHG under TMH during 2003 - 2008 (₹ in Lakhs)

Districts	East Khasi Hills	West Khasi Hills	Jaintia Hills	Ri-Bhoi	East Garo Hills	West Garo Hills	South Garo Hills	Total
No. of SHG	275	227	182	128	215	192	132	1351
Financial grant	13.75	11.35	9.1	6.4	10.75	9.6	6.6	67.55

Each SHG was given ₹5000/- for the Development of Horticulture

2.5 Summary

We know that Meghalaya is spread over a geographical area of 22,429 sq km. with a border area of 443 km with Bangladesh. Meghalaya has many rivers such as Daring, Sanda, Umkhri, Digaru in different regions. These rivers have created deep gorges and some of the most beautiful waterfalls. Most of these are rain fed and are therefore seasonal. Meghalaya has rich deposits of valuable minerals like coal, limestone, uranium and silimanite. With average annual rainfall as high as 1200 cm in some areas, Meghalaya is the wettest state of India. It is also a home for many rare species of birds, flora and fauna etc. Meghalaya is rich in forest and agriculture and horticulture produce.

With all these favorable factors, why can't the Horticulture Missions in Meghalaya flourish? Meghalaya has got the potential to remove poverty altogether, increase the per capita expenditure, reduce the infant mortality rate, provide safe water, improve literacy and provide *pucca* houses with sanitation facility to each family in the rural areas. This is possible with the Technology Mission of Horticulture in Meghalaya.

If the farmers and the Ministry of Horticulture work in hand in hand then we can surely say that this will be a wealth generator-cum-employment provider mission for the farmers of the state. The Meghalaya Government can take advantage of the National Horticultural Mission for technical, managerial and financial support for creating infrastructure and market for horticulture produce. These missions will double the revenue of over one lakh families who are presently deployed in horticulture. In addition, it will also provide additional employment in fruit and vegetable processing industries to over 10,000 youth. The State can lay emphasis on production of traditional cashew, Khasi mandarin (orange), strawberry besides pineapple, turmeric, other medicinal plants and off-season vegetables. Enabling doubling of the income of 2 lakh families, provide employment for 42,500 youth. It will also generate export revenue of not less than ₹ 500 crore.

CHAPTER III

Assessment of Project Implementation in Districts

3.1 Introduction

Technology Mission of Horticulture (TMH) has been implemented in all the seven districts of Meghalaya. All TMH programmes can be grouped into seventeen (17) major categories of schemes. These categories include – (i) Fruits, (ii) Floriculture, (iii) Plantation Crops, (iv) Vegetables, (v) Spices, (vi) Medicinal Crops, (vii) Aromatic Crops, (viii) Creation of Water Sources, (ix) On Farm Water Management, (x) Production of Planting Materials, (xi) Transfer Of Technology, (xii) Organic Farming, (xiii) Agriculture Equipments, (xiv) Integrated Pest Management, (xv) On Farm handling units, (xvi) SHG formation , (xvii) Arecanut Soakage Tank.

In this chapter, the physical target and financial target achievements during 2001 – 2008 in all seven districts of Meghalaya have been assessed. Assessment also includes district wise programmatic achievements.

3.2 Process of TMH Implementation

The implementation of Technology Mission started with the establishment of Small Farmer's Agri-Business Consortium (SFAC) at the state level under the Department of Agriculture & Co-operation (DAC). SFAC provides financial assistance for promotion of the innovative ideas for generating income and employment in rural areas through support to the various types of agri-business. The SFAC has been set up with the objective of Promotion of the innovative ideas for generating income and employment in rural areas through support to the various types of agri-business The SFAC at state level was supposed to prepare an annual report giving details of the programmes implemented under the mission and benefits accrued to the state and provide it to Technology Mission Cell and also to keep the DAC informed with list of beneficiaries along with their names, addresses, area & location and details of funds provided to them and for the purpose. The work of the SFAC also included obtaining of progress reports (monthly, quarterly, half yearly and yearly) from the district level implementing agencies i.e. District Horticulture Departments etc. and also compiling them and sending it to the technology mission cell at DAC. It was proposed that SFAC would act directly as an implementing agency for any component of the TM on the approval from DAC.

The release of funds to District Horticulture Officers has been done on the recommendations of Director Horticulture/Nodal Officer. The allocation of funds was also subject to the physical verification of the on-going approved programmes to collect the information about the progress of the components under TM. The SFAC, implementing agency, on receipt of funds from DAC should release these funds to the designated agencies of the state within 15 days.

3.3 Physical achievement of TMH implementation

Under area expansion of horticultural crops since inception of the TMH nearly 34% additional land was brought under horticulture crops. Under TMH, besides introduction of improved

production technology in traditional crops, promotion of commercial cultivation of potential crops viz. Citrus, Banana, Pineapple, Strawberry, Kiwi, Apple, Passion Fruits, Anthurium, Roses, Lilium and other cut flowers; and high value vegetable crops e.g. Cherry Tomato, Bird Eye Chilli, and coloured capsicum etc. was given high priority. Crop expansion was done keeping in view the marketability of specific crop in different districts.

TMH attempted to provide alternative to traditional '*Jhoom*' cultivation and thereby tried to offer commercially viable cropping system in place of subsistent shifting agrarian system. The selection of beneficiaries was done in a manner that the beneficiaries might be able to shift from traditional subsistent agriculture to commercial agriculture. The selection of beneficiaries and area were also designed to provide linkages between activities of all the four Mini Missions (Refer Chapter II for details) in an integrated manner.

A brief summary of the physical achievements as provided by the respective district horticulture departments are as follows:

3.3.1 Area and Coverage under TMH intervention

Altogether, area of 30382 ha was brought under eight crop based TMH schemes viz. Area Expansion for Fruits, Vegetables, Roots and Tubers, Spices, Plantation Crops, Medicinal Crops, Aromatic Plants and Floriculture during 2001-2008. East Khasi Hill district had (4192 ha), West Khasi Hills (3751 ha), Ri-Bhoi district (5833 ha), Jaintia Hills (3444.5 ha), East Garo (6746 ha), West Garo Hills (4103 ha), South Garo Hills (2313 ha) (Table 3.1).

Apart from these, other components under TMH (viz. Creation of Water Sources, On Farm Management, On Farm Handling Unit, Production of Planting Material, Transfer of Technology, Organic Farming, Agriculture Equipments, Integrated Pest Management, Women Development (SHG Group), Workshop, Arecanut Soakage Tank, Centre for Excellence, Bee keeping, Technical Assistance and Integrated Mushroom Unit were also implemented during 2001-08. During 2001-08, 346153 units were created for the various above mentioned components in Meghalaya. East Khasi Hill district had (36050), West Khasi Hills (10465.5), Ri-Bhoi district (44974), Jaintia Hills (9189.5), East Garo (163751), West Garo Hills (73747.4), South Garo Hills (7976) (Table 3.2).

Scheme wise, achievements during 2001-08 on Area Expansion of Fruits was 10813.5 ha, Vegetables 4805 ha, Roots and Tubers 557 ha, Spices 3416 ha, Plantation crops 1745 ha , Medicinal Crop 240 ha, Aromatic plants 133 ha, Floriculture 8673 ha. Similarly physical achievements in terms of number of units during 2001-08 on Other Support Schemes like Creation of Water Resources was 34518, On Farm Management Scheme 143643, On Farm handling units 209, Production of Planting Material 147, Transfer of Technology 7664, Organic Farming 2846, Agriculture Equipment 4921, Integrated Pest Management 7260, Development of women SHGs 1832, Arecanut Soakage Tank 50, Centre for excellence Passion Fruit 6, Centre for excellence Strawberry 1, Centre for excellence Anthurium 2, Bee Keeping 2000, Integrated Mushroom 71 (Table 3.1 and Table 3.2).

Table 3.1 Physical achievements for area expansion of crops under TMH (MM II) during 2001–08 (Hectares)

Sl. No.	Component	District							Total
		East Khasi Hills	West Khasi Hills	Ri-Bhoi	Jaintia Hills	East Garo Hills	West Garo Hills	South Garo Hills	
1	Fruits	**1488**	**1459**	**1987**	**1239.5**	**2039**	**1645**	**956**	**10813.5**
2	Vegetables	**1001**	**647**	**598**	**518**	**983**	**670**	**388**	**4805**
3	Roots and tubers	**112**	**105**	**55**	**94**	**50**	**89**	**52**	**557**
4	Spices	**341**	**400**	**461**	**732**	**644**	**580**	**258**	**3416**
5	Plantation crops	**83**	**93**	**100**	**83**	**168**	**612**	**606**	**1745**
6	Medicinal crops	**38**	**40**	**33**	**31**	**34**	**36**	**28**	**240**
7	Aromatic crops	**6**	**16**	**17**	**21**	**36**	**22**	**15**	**133**
8	Floriculture	**1123**	**991**	**2582**	**726**	**2792**	**449**	**10**	**8673**
Total		**4192**	**3751**	**5833**	**3444.5**	**6746**	**4103**	**2313**	**30382.5**

Source of data: Director of Horticulture, Managing Director (MgSFAC), Meghalaya

Table 3.2 Physical achievements for Other Support Schemes under TMH (MM II) in Meghalaya during 2001–08 (No of units)

Sl. No.	Components /	District							Total
		East Khasi Hills	West Khasi Hills	Ri- Bhoi	Jaintia Hills	East Garo Hills	West Garo Hills	South Garo Hills	
1	Creation Of Water Resources	5178	5139	1256	5141	126	14171	3507	**34518**
2	On Farm Management	26407	949.5	39693	515.5	69160.5	5640.5	1277	**143643**
3	On Farm Handling Unit	35	22	70	21	22	25	14	**209**
4	Production Of Planting Materials	39	9	22	12	27	27	11	**147**
5	Transfer Of Technology	1194	1124	1011	1095	1041	1253	946	**7664**
6	Organic Farming	429	390	462	368	372	392	433	**2846**
7	Agriculture Equipments	544	1157	812	449	516	919	524	**4921**
8	Integrated Pest	1440	1077	1189	1027	1052	662.9	813	**7260.9**

	Management								
9	Women Development	416	297	196	250	213	260	200	**1832**
10	Workshop Seminar	1							**1**
11	Arecanut Storage Tank	15		10	10		5	10	**50**
12	Centre For Excellence Passion Fruit	1	1	1	1	1	1		**6**
13	Centre For Excellence Strawberry			1					**1**
14	Centre For Excellence Anthurium			1		1			**2**
15	Centre For Excellence Rose			0					**0**
16	Bee Keeping	350	300	250	300	280	350	170	**2000**
17	Technical Support/ Laboratory	1							**1**
18	Area Expansion Of Centre Of Excellence					90939	50040		**140979**
19	Integrated Mushroom Unit						1	70	**71**
Total		**36050**	**10465.5**	**44974**	**9189.5**	**163751**	**73747.4**	**7975**	**346151.9**

Source of data: Director of Horticulture, Managing Director (MgSFAC), Meghalaya

District wise physical targets/achievements

***Note*:** As per the source data provided by Director of Horticulture, Meghalaya, Physical Targets were same as the Physical Achievements for all districts during the financial years 2001-02 to 2007-08 (Ref Tables 3.3 – 3.9).

Table 3.3 Physical achievement in East Khasi District during 2001–08

	Components	2001-02	2002-03	2003-04	2004-.05	2005-06	2006-07	2007-08	Total
A	**Area Expansion**								
1	Fruits	247	209	72	223	95	277	365	**1488**
2	Vegetables	40	54	48	100	209	380	170	**1001**
3	Roots and tubers	17	14		31			50	**112**
4	Spices	23	52	51	70	45	20	80	**341**

5	Plantation crops	3	38	17	15		10		**83**
6	Medicinal crops	8	15	3	12				**38**
7	Aromatic crops	3	3						**6**
8	Floriculture	15	25	5	14	169	855	40	**1123**
	Total	**356**	**410**	**196**	**465**	**518**	**1542**	**705**	**4192**
C	**Creation of water resources**	13	10	58	23	5031	43		**5178**
D	**On Farm Management**	32	62	156	20607	155	5225	170	**26407**
E	**On Farm Handling unit**		5	10	12		8		**35**
F	**Production of planting materials**	5	4		5	1	3	21	**39**
G	**Transfer of Technology**	159	82	182	121	75	125	450	**1194**
H	**Organic farming**	38	93	21	60	125	92		**429**
I	**Agriculture equipments**	39	140	165	72	13	115		**544**
J	**Integrated pest management**	283	731	99	164		163		**1440**
K	**Women development**		161	73	62	50	20	50	**416**
L	**Workshop Seminar**		1						**1**
M	**Arecanut Storage tank**				15				**15**
N	**Centre for excellence passion fruit**				1				**1**
O	**Bee keeping**							350	**350**
P	**Technical support/ laboratory**	1							**1**
	Total C-P	**570**	**1289**	**764**	**21142**	**5450**	**5794**	**1041**	**36050**

Source of data: Director of Horticulture, Managing Director (MgSFAC), Meghalaya

Table 3.4 Physical achievement in West Khasi District during 2001–08

	Components	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Total
A	**Area Expansion**								
1	Fruits	132	140	64	155	225	173	570	**1459**
2	Vegetables	24	25	33	20	190	285	70	**647**
3	Roots and tubers	16	12		27			50	**105**
4	Spices	21	52	47	80	75	5	120	**400**
5	Plantation crops	10	42	16	15		10		**93**
6	Medicinal crops	8	16	2	14				**40**
7	Aromatic crops	3	3		10				**16**
8	Floriculture			1			950	40	**991**
	Subtotal of A	**214**	**290**	**163**	**321**	**490**	**1423**	**850**	**3751**
C	**Creation of water resources**	7		24	12	5031	45	20	**5139**

D	**On Farm Management**	11	10	117	33.5	472	126	180	**949.5**
E	**On Farm Handling unit**		3	4	7		8		**22**
F	**Production of planting unit**	1	1	2	1	1	3		**9**
G	**Transfer of Technology**	117	65	173	109	95	165	400	**1124**
H	**Organic farming**	26	73	19	50	110	92	20	**390**
I	**Agriculture equipments**	37	104	145	20	24	287	540	**1157**
J	**Integrated pest management**	250	381	84	102		160	100	**1077**
K	**Women development**		70	30	47	80	20	50	**297**
N	**Centre for excellence passion fruit**				1				**1**
O	**Technical support**								**0**
P	**Bee Keeping**							300	**300**
	Total C-P	**449**	**707**	**598**	**382.5**	**5813**	**906**	**1610**	**10465 .5**

Source of data: Director of Horticulture, Managing Director (MgSFAC), Meghalaya

Table 3.5 Physical achievement in Ri- Bhoi District during 2001–08

	Components	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Total
A	**Area Expansion**								
1	Fruits	110	168	63	165	195	152	1134	**1987**
2	Vegetables	32	36	35	25	200	250	20	**598**
3	Roots and tubers	11	12		12			20	**55**
4	Spices	28	61	53	54	150	35	80	**461**
5	Plantation crops	15	69	16					**100**
6	Medicinal crops	6	14	2	11				**33**
7	Aromatic crops	3	6		8				**17**
8	Floriculture	8	10	2	12	836	399	1315	**2582**
	Subtotal of A	**213**	**376**	**171**	**287**	**1381**	**836**	**2569**	**5833**
C	**Creation of water resources**	8	5	25	14	1025	45	134	**1256**
D	**On Farm Management**	15	22	129	19186	9441	10140	760	**39693**
E	**On Farm Handling unit**		4	2	9		7	48	**70**
F	**Production of planting unit**	2	1	2	5	3	5	4	**22**
G	**Transfer of Technology**	117	60	173	111	95	105	350	**1011**
H	**Organic farming**	25	75	19	25	126	92	100	**462**
I	**Agriculture equipments**	37	104	145	102	32	322	70	**812**
J	**Integrated pest management**	250	571	92	103		173		**1189**

K	**Women development**		70	10	43	5	18	50	**196**
M	**Arecanut Storage tank**				10				**10**
N	**Centre for excellence Strawberry**				1				**1**
O	**Centre for excellence Rose**				1				**1**
P	**Centre for excellence passion fruit**				1				**1**
Q	**Technical Support**								**0**
R	**Bee Keeping**							250	**250**
	Total C-P	**454**	**912**	**597**	**19611**	**10727**	**10907**	**1766**	**44974**

Source of data: Director of Horticulture, Managing Director (MgSFAC), Meghalaya

Table 3.6 Physical achievement in Jaintia District during 2001–08

	Components	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Total
A	**Area Expansion**								
1	Fruits	142	129	58	128.5	75	202	505	**1239.5**
2	Vegetables	28	31	31	13	100	195	120	**518**
3	Roots and tubers	15	12		17			50	**94**
4	Spices	48	67	48	39	105	135	290	**732**
5	Plantation crops	10	43	15	15				**83**
6	Medicinal crops	6	13	2	10				**31**
7	Aromatic crops	3	3		15				**21**
8	Floriculture			1			685	40	**726**
	Subtotal of A	**252**	**298**	**155**	**237.5**	**280**	**1217**	**1005**	**3444.5**
C	**Creation of water resources**	9	5	25	12	5028	42	20	**5141**
D	**On Farm Management**	13	25	124	30.5	76	107	140	**515.5**
E	**On Farm Handling unit**		3	3	7		8		**21**
F	**Production of planting material**	2	1	1	3		3	2	**12**
G	**Transfer of Technology**	117	65	173	110	70	160	400	**1095**
H	**Organic farming**	26	76	19	34	106	87	20	**368**
I	**Agriculture equipments**	37	104	143	22	23	80	40	**449**
J	**Integrated pest management**	250	340	91	86		160	100	**1027**
K	**Women development**		80	10	42	50	18	50	**250**
M	**Arecanut Storage tank**				10				**10**
N	**Centre for excellence passion fruit**				1				**1**
O	**Technical support**								**0**
P	**Bee Keeping**							300	**300**

	Total C-P	**454**	**699**	**589**	**357.5**	**5353**	**665**	**1072**	**9189.5**

Source of data: Director of Horticulture, Managing Director (MgSFAC), Meghalaya

Table 3.7 Physical achievement in East Garo District during 2001–08

	Components	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Total
A	**Area Expansion**								
1	Fruits	106	148	56	482	320	282	645	**2039**
2	Vegetables	24	25	34	25	270	485	120	**983**
3	Roots and tubers	15	13		12			10	**50**
4	Spices	30	62	52	130	90	30	250	**644**
5	Plantation crops	34	68	26	40				**168**
6	Medicinal crops	6	15	2	11				**34**
7	Aromatic crops	2	4		30				**36**
8	Floriculture					441	666	1685	**2792**
	Subtotal of A	**217**	**335**	**170**	**730**	**1121**	**1463**	**2710**	**6746**
C	**Creation of water resources**	7		27	17	30	45		**126**
D	**On Farm Management**	9	10	129	18700.5	20853	29106	353	**69160.5**
E	**On Farm Handling unit**		3	4	7		8		**22**
F	**Production of planting material**	1	1	2	10	3	4	6	**27**
G	**Transfer of Technology**	117	65	173	111	65	160	350	**1041**
H	**Organic farming**	25	75	19	43	118	92		**372**
I	**Agriculture equipments**	39	104	144	50	18	161		**516**
J	**Integrated pest management**	270	330	87	201		164		**1052**
K	**Women development**			58	52	35	18	50	**213**
N	**Centre for excellence Anthurium**				1				**1**
O	**Centre for excellence passion fruit**				1				**1**
P	**Technical support**								**0**
Q	**Area Expansion of centre of excellence**							90939	**90939**
R	**Bee Keeping**							280	**280**
	Total C-P	**468**	**588**	**643**	**19193.5**	**21122**	**29758**	**91978**	**163751**

Source of data: Director of Horticulture, Managing Director (MgSFAC), Meghalaya

Table 3.8 Physical achievement in West Garo District during 2001–08

	Components	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Total
A	**Area Expansion**								
1	Fruits	118	133	59	188	200	277	670	**1645**
2	Vegetables	32	25	33	20	140	300	120	**670**
3	Roots and tubers	15	12		12			50	**89**
4	Spices	29	59	52	105	75	40	220	**580**
5	Plantation crops	43	74	25	40	200	130	100	**612**
6	Medicinal crops	10	13	2	11				**36**
7	Aromatic crops	4	3		15				**22**
8	Floriculture	7	15	1	2	139	235	50	**449**
	Subtotal of A	**258**	**334**	**172**	**393**	**754**	**982**	**1210**	**4103**
B	**Integrated mushroom unit**		1						**1**
C	**Creation of water resources**	12	10	26	15	14035	43	30	**14171**
D	**On Farm Management**	17	27	134	50.5	189	5083	140	**5640.5**
E	**On Farm Handling unit**		4	6	7		8		**25**
F	**Production of planting material**	5	1	2	2	4	3	10	**27**
G	**Transfer of Technology**	120	70	173	110	65	265	450	**1253**
H	**Organic farming**	39	78	19	54	115	87		**392**
I	**Agriculture equipments**	39	116	151	26	17	200	370	**919**
J	**Integrated pest management**	270	3.9	91	138		160		**662.9**
K	**Women development**		70	30	42	50	18	50	**260**
M	**Arecanut Storage tank**				5				**5**
N	**Centre for excellence passion fruit**				1				**1**
O	**Technical support**								**0**
P	**Area Expansion of centre of excellence**							50040	**50040**
Q	**Bee Keeping**							350	**350**
	Total C-P	**502**	**380.9**	**632**	**450.5**	**14475**	**5867**	**51440**	**73747.4**

Source of data: Director of Horticulture, Managing Director (MgSFAC), Meghalaya

Table 3.9 Physical achievement in South Garo District during 2001–08

	Components	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Total
A	**Area Expansion**								
1	Fruits	95	113	53	158	100	107	330	**956**
2	Vegetables	20	25	26	22	60	165	70	**388**
3	Roots and tubers	11	12		9			20	**52**

4	Spices	21	47	48	57	40	45		**258**
5	Plantation crops	35	66	25	30	100	250	100	**606**
6	Medicinal crops	6	14	2	6				**28**
7	Aromatic crops	2	3		10				**15**
8	Floriculture						10		**10**
	Subtotal of A	**190**	**280**	**154**	**292**	**300**	**577**	**520**	**2313**
B	**Integrated mushroom unit**							70	**70**
C	**Creation of water resources**	7		17	11	3421	36	15	**3507**
D	**On Farm Management**	7	10	110	21	51	1068	10	**1277**
E	**On Farm Handling unit**		3	5	5		1		**14**
F	**Production of planting unit**		1	1	1		2	6	**11**
G	**Transfer of Technology**	117	55	170	109	65	130	300	**946**
H	**Organic farming**	25	62	19	23	105	49	150	**433**
I	**Agriculture equipments**	34	101	141	18	8	97	125	**524**
J	**Integrated pest management**	210	260	81	102		160		**813**
K	**Women development**		50	10	42	30	18	50	**200**
M	**Arecanut Storage tank**				10				**10**
N	**Centre for excellence passion fruit**				1				**1**
O	**Technical support**								**0**
P	**Bee Keeping**							170	**170**
	Total C-P	**400**	**542**	**554**	**343**	**3680**	**1561**	**896**	**7976**

Source of data: Director of Horticulture, Managing Director (MgSFAC), Meghalaya

3.4 Financial achievement of TMH implementation

Altogether, ₹ 3010.99 lakhs was spent under eight crop based TMH schemes viz. Area Expansion for Fruits, Vegetables, Roots and Tubers, Spices, Plantation Crops, Medicinal Crops, Aromatic Plants and Floriculture during 2001-2008. East Khasi Hill district had (₹ 540.39 lakhs), West Khasi Hills (₹ 463.96 Lakhs), Ri-Bhoi district (₹ 695.38 Lakhs), Jaintia Hills (₹ 429.02 lakhs), East Garo (₹ 106.84 Lakhs), West Garo Hills (₹ 497.58 Lakhs), South Garo Hills (₹ 277.82 Lakhs) (Table 3.10).

Apart from these, other components under TMH (viz. Creation of Water Sources, On Farm Management, On Farm Handling Unit, Production of Planting Material, Transfer of Technology, Organic Farming, Agriculture Equipments, Integrated Pest Management, Women Development (SHG Group), Workshop, Arecanut Soakage Tank, Centre for Excellence, Bee keeping, Technical Assistance and Integrated Mushroom Unit were also implemented during 2001-08. During 2001-08, ₹ 5900.78 lakhs was spent for various the various above mentioned components in Meghalaya. East Khasi Hill district had (₹ 929.58 lakhs), West Khasi Hills (₹ 581.54 Lakhs), Ri-Bhoi district (₹ 1481.74 Lakhs), Jaintia Hills (₹

572.88 lakhs), East Garo (₹ 1215.96 Lakhs), West Garo Hills (₹ 723.14 Lakhs), South Garo Hills (₹ 395.94 Lakhs) (Table 3.11).

Scheme wise, expenditure during 2001-08 on Area Expansion of Fruits was ₹ 962.12 Lakhs, Vegetables ₹ 510.14 Lakhs, Roots and Tubers ₹ 69.8, Spices ₹ 385.08 lakhs, Plantation crops ₹ 215.28 Lakhs, Medicinal Crop ₹ 39.28 lakhs, Aromatic plants ₹ 7.75 Lakhs, Floriculture ₹ 821.54 Lakhs. Similarly expenditure during 2001-08 on Other Support Schemes which like Creation of Water Resources was ₹ 536.195 Lakhs, On Farm Management Scheme ₹ 2185.12 Lakhs, On Farm handling units ₹ 108 lakhs, Production of Planting Material ₹ 710.5 Lakhs, Transfer of Technology ₹ 170.90 Lakhs, Organic Farming ₹ 632 Lakhs, Agriculture Equipment ₹ 394.29 Lakhs, Integrated Pest Management ₹ 188.32 lakhs, Development of women SHGs ₹ 92.26 lakhs, Arecanut Soakage Tank ₹ 141.64 lakhs, Centre for excellence Passion Fruit ₹ 176.82 lakhs, Centre for excellence Strawberry ₹ 170 lakhs, Centre for excellence Anthurium ₹ 67.38 lakhs, Centre for excellence Rose ₹ 69.93 lakhs, Bee Keeping ₹ 15.1 lakhs, Area Expansion of centre of excellence ₹ 248.9 lakhs, Integrated Mushroom Unit ₹ 50.7 lakhs (Table 3.10 and Table 3.11).

***Note*:** As per the source data provided by Director of Horticulture, Meghalaya, Financial Targets were same as the Fund allocation/ Achievements for all districts during the financial years 2001-02 to 2007-08 (Ref Tables 3.10 – 3.18).

Table 3.10 Financial achievements for area expansion of crops under TMH (MM II) during 2001–08 (₹ lakh)

Sl. No.	Component	District							Total
		East Khasi Hills	West Khasi Hills	Ri-Bhoi	Jaintia Hills	East Garo Hills	West Garo Hills	South Garo Hills	
1	Fruits	171.77	165.79	190.52	143.53	10.27	175.9	104.34	**962.12**
2	Vegetables	130.66	84.36	77.74	67.34	12.5	87.1	50.44	**510.14**
3	Roots and tubers	14.83	14.37	7.15	12.22	2.9	11.57	6.76	**69.8**
4	Spices	44.33	52	59.93	95.16	27.75	74.1	31.81	**385.08**
5	Plantation crops	10.79	12.09	13	10.79	10.27	79.56	78.78	**215.28**
6	Medicinal crops	4.94	5.2	4.29	4.03	12.5	4.68	3.64	**39.28**
7	Aromatic crops	0.3	0.8	0.85	1.05	2.9	1.1	0.75	**7.75**
8	Floriculture	162.77	129.35	341.9	94.9	27.75	63.57	1.3	**821.54**
Total		**540.39**	**463.96**	**695.38**	**429.02**	**106.84**	**497.58**	**277.82**	**3010.99**

Source of data: Director of Horticulture, Managing Director (MgSFAC), Meghalaya
Note: There were errors in addition in the source data which were rectified in the table given above

Table 3.11 Financial achievements for Other Support Schemes under TMH (MM II) in Meghalaya during 2001–08 (₹ lakh)

Sl. No.	Components	District							Total
		East Khasi Hills	West Khasi Hills	Ri-Bhoi	Jaintia Hills	East Garo Hills	West Garo Hills	South Garo Hills	
1	Creation Of Water Resources	100.98	65.34	105.19	69.975	54.905	91.135	48.67	**536.195**
2	On Farm Management	250.505	241.05	708.305	207.72	509.2	192.765	75.57	**2185.12**
3	On Farm Handling Unit	17.5	11	36	10.5	11	12.5	9.5	**108**
4	Production Of Planting Materials	153	36.5	119.5	75.75	129	141.5	55.25	**710.5**
5	Transfer Of Technology	45.39	20.99	22.79	20.755	19.725	22.97	18.285	**170.905**
6	Organic Farming	98	86.6	98.4	82.6	82.2	83.8	100.4	**632**
7	Agriculture Equipments	50.485	58.805	91.795	48.265	50.02	59.28	35.64	**394.29**
8	Integrated Pest Management	118.36	14.76	15.88	10.27	10.43	10.49	8.13	**188.32**
9	Women Development	17.96	14.85	9.8	12.5	14.15	13	10	**92.26**
10	Workshop Seminar	16.5		2.9	2.9				**22.3**
11	Arecanut Storage Tank	4.35		105.19	27.75		1.45	2.9	**141.64**
12	Centre For Excellence Passion Fruit	27.75	27.75	27.75	10.27	27.75	27.75	27.8	**176.82**
13	Centre For Excellence Strawberry			170					**170**
14	Centre For Excellence Anthurium					67.38			**67.38**
15	Centre For Excellence Rose			69.93					**69.93**
16	Bee Keeping	2.8	1.5	2	2.4	2	2.8	1.6	**15.1**
17	Technical Support/ Laboratory	26	2.4	1.5	1.5	1.5	1.5	1.5	**35.9**

18	Area Expansion Of Centre Of Excellence					236.7	12.2		**248.9**
19	Integrated Mushroom Unit						50	0.7	**50.7**
Total		**929.58**	**581.54**	**1586.93**	**583.155**	**1215.96**	**723.14**	**395.94**	**6016.26**

Source of data: Director of Horticulture, Managing Director (MgSFAC), Meghalaya
Note: There were errors in addition in the source data which were rectified in the table given above

3.5 District wise financial targets/allocation

Table 3.12 Financial allocation in East Khasi District during 2001–08 (₹ lakh)

	Components	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Total
A	**Area Expansion**								
1	Fruits	32.11	27.17	9.35	28.99	12.35	29.29	32.51	**171.77**
2	Vegetables	5.2	7.02	6.24	13	27.7	49.4	22.1	**130.66**
3	Roots and tubers	2.21	1.82		4.3			6.5	**14.83**
4	Spices	2.99	6.76	6.63	9.1	5.85	2.6	10.4	**44.33**
5	Plantation crops	0.39	4.94	2.21	1.95		1.3		**10.79**
6	Medicinal crops	1.04	1.95	0.39	1.56				**4.94**
7	Aromatic crops	0.15	0.15						**0.3**
8	Floriculture	9.75	3.25	3.25	9.1	21.97	110.25	5.2	**162.77**
	Total	**53.84**	**53.06**	**28.08**	**67.73**	**67.87**	**192.84**	**76.71**	**540.39**
C	**Creation of water resources**	9.5	10	37	15.13	10.85	18.5		**100.98**
D	**On Farm Management**	5.87	24.8	28.945	46.25	46.6	53.54	44.5	**250.505**
E	**On Farm Handling unit**		2.5	5	6		4		**17.5**
F	**Production of planting materials**	39	18		21	3	9	63	**153**
G	**Transfer of Technology**	14.32	7.3	3.67	2.23	2.32	7.8	7.75	**45.39**
H	**Organic farming**	4	17	6.3	8.6	37.5	24.6		**98**
I	**Agriculture equipments**	2.11	5.64	10.615	18.6	2.97	10.55		**50.485**
J	**Integrated pest management**	26.8	87.3	0.99	1.64		1.63		**118.36**
K	**Women development**		5.21	3.65	3.1	2.5	1	2.5	**17.96**
L	**Workshop Seminar**		1.5				15		**16.5**
M	**Arecanut Storage tank**				4.35				**4.35**

N	**Centre for excellence passion fruit**				27.75				**27.75**
O	**Bee keeping**							2.8	**2.8**
P	**Technical support/ laboratory**	20					6		**26**
	Grand Total	**175.44**	**232.31**	**124.25**	**222.38**	**173.075**	**344.64**	**197.263**	**1469.97**

Source of data: Director of Horticulture, Managing Director (MgSFAC), Meghalaya
Note: There were errors in addition in the source data which were rectified in the table given above

Table 3.13 Financial allocation in West Khasi District during 2001–08 (₹ lakh)

		2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Total
A	**Area Expansion**								
1	Fruits	17.16	18.17	8.32	20.15	29.25	19.27	53.47	**165.79**
2	Vegetables	3.12	3.25	4.29	2.6	24.7	37.3	9.1	**84.36**
3	Roots and tubers	2.8	1.56		3.51			6.5	**14.37**
4	Spices	2.73	6.76	6.11	10.4	9.75	0.65	15.6	**52**
5	Plantation crops	1.3	5.46	2.08	1.95		1.3		**12.09**
6	Medicinal crops	1.04	2.08	0.26	1.82				**5.2**
7	Aromatic crops	0.15	0.15		0.5				**0.8**
8	Floriculture	0	0	0.65			123.5	5.2	**129.35**
	Subtotal of A	**27.58**	**37.2**	**21.71**	**40.93**	**63.7**	**182.08**	**89.87**	**463.07**
C	**Creation of water resources**	3.5		16.13	7.88	7.83	18.75	11.25	**65.34**
D	**On Farm Management**	2.26	4	20.75	11.465	90.255	61.57	50.75	**241.05**
E	**On Farm Handling unit**		1.5	2	3.5		4		**11**
F	**Production of planting unit**	6	3	6.5	3	3	15		**36.5**
G	**Transfer of Technology**	2.17	1.225	3.505	2.025	2.14	2.925	7	**20.99**
H	**Organic farming**	2.8	7.9	5.7	6.6	33	24.6	6	**86.6**
I	**Agriculture equipments**	2.08	4.35	8.685	6.84	5.4	13.15	18.3	**58.805**
J	**Integrated pest management**	2.5	7.8	0.84	1.02		1.6	1	**14.76**
K	**Women development**		3.5	1.5	2.35	4	1	2.5	**14.85**
N	**Centre for excellence passion fruit**				27.75				**27.75**

O	**Technical support**						1.5		**1.5**
P	**Bee Keeping**							2.4	**2.4**
	Grand Total	**48.9**	**70.475**	**87.32**	**113.36**	**209.32**	**325.87**	**189.075**	**1044.32**

Source of data: Director of Horticulture, Managing Director (MgSFAC), Meghalaya
Note: There were errors in addition in the source data which were rectified in the table given above

Table 3.14 Financial allocation in Ri Bhoi District during 2001–08 (₹ lakh)

	Components	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Total
A	**Area Expansion**								
1	Fruits	14.3	21.84	8.19	21.45	26	15.03	83.71	**190.52**
2	Vegetables	4.16	4.68	4.55	3.25	26	32.5	2.6	**77.74**
3	Roots and tubers	1.43	1.56		1.56			2.6	**7.15**
4	Spices	3.64	7.93	6.89	7.02	19.5	4.55	10.4	**59.93**
5	Plantation crops	1.95	8.97	2.08					**13**
6	Medicinal crops	0.78	1.82	0.26	1.43				**4.29**
7	Aromatic crops	0.15	0.3		0.4				**0.85**
8	Floriculture	5.2	1.3	1.3	7.8	108.68	51.87	165.75	**341.9**
	Subtotal of A	**31.61**	**48.66**	**23.27**	**42.91**	**180.18**	**103.95**	**265.5**	**696.08**
C	**Creation of water resources**	3.62	5	14.5	10.13	6.69	18.75	46.5	**105.19**
D	**On Farm Management**	3.01	8.8	23.335	30.1	210.92	88.64	343.5	**708.305**
E	**On Farm Handling unit**		2	2	4.5		3.5	24	**36**
F	**Production of planting unit**	9	6	4.5	20	20	28	32	**119.5**
G	**Transfer of Technology**	2.17	1.15	3.505	5.55	2.14	2.025	6.25	**22.79**
H	**Organic farming**	2.5	8.1	5.7	5.1	37.8	24.6	14.6	**98.4**
I	**Agriculture equipments**	2.08	4.89	8.685	33.26	10.08	15.7	17.1	**91.795**
J	**Integrated pest management**	2.5	9.7	0.92	1.03		1.73		**15.88**
K	**Women development**		3.5	0.5	2.15	0.25	0.9	2.5	**9.8**
M	**Arecanut Storage tank**				2.9				**2.9**
N	**Centre for excellence Strawberry**				170				**170**
O	**Centre for excellence Rose**				69.93				**69.93**
P	**Centre for excellence passion fruit**				27.75				**27.75**
Q	**Technical Support**						1.5		**1.5**
R	**Bee Keeping**							2	**2**
	Grand Total	**56.51**	**97.8**	**86.915**	**425.31**	**468.16**	**289.3**	**753.505**	**2177.5**

Source of data: Director of Horticulture, Managing Director (MgSFAC), Meghalaya
Note: There were errors in addition in the source data which were rectified in the table given above

Table 3.15 Financial allocation in Jaintia Hill District during 2001–08 (₹ lakh)

	Components	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Total
A	**Area Expansion**								
1	Fruits	18.46	16.77	7.51	16.7	9.75	26.66	47.68	**143.53**
2	Vegetables	3.64	4.03	4.03	1.69	13	25.35	15.6	**67.34**
3	Roots and tubers	1.95	1.56		2.21			6.5	**12.22**
4	Spices	6.24	8.71	6.24	5.07	13.65	17.55	37.7	**95.16**
5	Plantation crops	1.3	5.59	1.95	1.95				**10.79**
6	Medicinal crops	0.78	1.69	0.26	1.3				**4.03**
7	Aromatic crops	0.15	0.15		0.75				**1.05**
8	Floriculture	0	0	0.65			89.05	5.2	**94.9**
	Subtotal of A	**32.52**	**38.5**	**20.64**	**29.67**	**36.4**	**158.6**	**112.6**	**429.02**
C	**Creation of water resources**	4.625	5	16.25	8	7.35	17.5	11.25	**69.975**
D	**On Farm Management**	3.065	10	75.77	10.15	22.71	42.37	43.65	**207.72**
E	**On Farm Handling unit**		1.5	1.5	3.5		4		**10.5**
F	**Production of planting material**	12	3	4.25	15.5		15	26	**75.75**
G	**Transfer of Technology**	2.175	1.225	3.505	2.05	2	2.8	7	**20.755**
H	**Organic farming**	2.8	8.2	5.7	5	31.8	23.1	6	**82.6**
I	**Agriculture equipments**	2.085	4.89	8.12	7.02	4.95	10.4	10.8	**48.265**
J	**Integrated pest management**	2.5	3.4	0.91	0.86		1.6	1	**10.27**
K	**Women development**		4	0.5	2.1	2.5	0.9	2.5	**12.5**
M	**Arecanut Storage tank**				2.9				**2.9**
N	**Centre for excellence passion fruit**				27.75				**27.75**
O	**Technical support**						1.5		**1.5**
P	**Bee Keeping**							2.4	**2.4**
	Grand Total	**61.77**	**79.715**	**137.14**	**114**	**107.705**	**277.79**	**223.281**	**1001.401**

Source of data: Director of Horticulture, Managing Director (MgSFAC), Meghalaya

Note: There were errors in addition in the source data which were rectified in the table given above

Table 3.16 Financial allocation in East Garo District during 2001–08 (₹ lakh)

	Components	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Total
A	**Area Expansion**								
1	Fruits	13.78	19.24	7.28	62.66	41.6	31.53	53.09	**229.18**
2	Vegetables	3.12	3.25	4.42	3.25	35.1	63.05	15.6	**127.79**

3	Roots and tubers	1.95	1.69		1.56			1.3	**6.5**
4	Spices	3.9	8.06	6.76	16.9	11.7	3.9	32.5	**83.72**
5	Plantation crops	4.42	8.84	3.38	5.2				**21.84**
6	Medicinal crops	0.78	1.95	0.26	1.43				**4.42**
7	Aromatic crops	0.1	0.2		1.5				**1.8**
8	Floriculture	0	0			53.43	86.58	219.1	**359.11**
	Subtotal of A	**28.5**	**43.23**	**22.1**	**92.5**	**141.83**	**185.06**	**321.59**	**834.81**
C	**Creation of water resources**	2.625		16.5	9.13	7.9	18.75		**54.905**
D	**On Farm Management**	1.88	4	23.355	18.1	203.235	60.63	198	**509.2**
E	**On Farm Handling unit**		1.5	2	3.5		4		**11**
F	**Production of planting material**	6	6	6.5	9.5	15	18	68	**129**
G	**Transfer of Technology**	2.175	1.225	3.505	2.08	1.69	2.8	6.25	**19.725**
H	**Organic farming**	2.5	8.1	5.7	5.9	35.4	24.6		**82.2**
I	**Agriculture equipments**	2.085	4.89	8.635	17.46	4.5	12.45		**50.02**
J	**Integrated pest management**	2.5	3.3	0.87	2.12		1.64		**10.43**
K	**Women development**		3.5	2.9	2.6	1.75	0.9	2.5	**14.15**
N	**Centre for excellence Anthurium**				67.38				**67.38**
O	**Centre for excellence passion fruit**				27.75				**27.75**
P	**Technical support**						1.5		**1.5**
Q	**Area Expansion of centre of excellence**							236.7	**236.7**
R	**Bee Keeping**							2	**2**
	Grand Total	**47.815**	**75.745**	**92.06**	**258.02**	**410.4**	**330.34**	**834.9**	**2049.28**

Source of data: Director of Horticulture, Managing Director (MgSFAC), Meghalaya
Note: There were errors in addition in the source data which were rectified in the table given above

Table 3.17 Financial allocation in West Garo District during 2001–08 (₹ lakh)

	Components	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Total
A	**Area Expansion**								
1	Fruits	15.34	17.29	7.67	24.44	26	30.41	54.75	**175.9**
2	Vegetables	4.16	3.25	4.29	2.6	18.2	39	15.6	**87.1**

3	Roots and tubers	1.95	1.56		1.56			6.5	**11.57**
4	Spices	3.77	7.67	6.76	13.65	9.75	3.9	28.6	**74.1**
5	Plantation crops	5.59	9.62	3.25	5.2	26	16.9	13	**79.56**
6	Medicinal crops	1.3	1.69	0.26	1.43				**4.68**
7	Aromatic crops	0.2	0.15		0.75				**1.1**
8	Floriculture	4.55	1.95	0.65	1.3	18.07	30.55	6.5	**63.57**
	Subtotal of A	**36.86**	**43.18**	**22.83**	**50.93**	**98.02**	**120.76**	**124.95**	**497.53**
B	**Integrated mushroom unit**		50						**50**
C	**Creation of water resources**	5.875	10	15.5	9.13	10.83	18.5	21.3	**91.135**
D	**On Farm Management**	3.515	10.8	24.17	15.27	57.36	39.2	42.45	**192.765**
E	**On Farm Handling unit**		2	3	3.5		4		**12.5**
F	**Production of planting material**	21	6	6.5	6	17	15	70	**141.5**
G	**Transfer of Technology**	2.25	1.3	3.505	2.05	1.69	4.425	7.75	**22.97**
H	**Organic farming**	4.1	8.4	5.7	8	34.5	23.1		**83.8**
I	**Agriculture equipments**	2.115	5.14	8.775	8.82	4.05	12.38	18	**59.28**
J	**Integrated pest management**	2.7	3.9	0.91	1.38		1.6		**10.49**
K	**Women development**		3.5	1.5	2.1	2.5	0.9	2.5	**13**
M	**Arecanut Storage tank**				1.45				**1.45**
N	**Centre for excellence passion fruit**				27.75				**27.75**
O	**Technical support**						1.5		**1.5**
P	**Area Expansion of centre of excellence**							12.2	**12.2**
Q	**Bee Keeping**							2.8	**2.8**
	Grand Total	**78.415**	**144.22**	**92.39**	**136.38**	**225.95**	**241.36**	**302**	**1220.715**

Source of data: Director of Horticulture, Managing Director (MgSFAC), Meghalaya

Note: There were errors in addition in the source data which were rectified in the table given above

Table 3.18 Financial allocation in South Garo District during 2001–08 (₹ lakh)

	Components	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	Total
A	**Area Expansion**								
1	Fruits	12.35	14.69	6.89	17.62	13	11.29	28.5	**104.34**
2	Vegetables	2.6	3.25	3.38	2.86	7.8	21.45	9.1	**50.44**
3	Roots and tubers	1.43	1.56		1.17			2.6	**6.76**
4	Spices		6.11	6.24	7.41	6.2	5.85		**31.81**

5	Plantation crops	4.55	8.58	3.25	3.9	13	32.5	13	**78.78**
6	Medicinal crops	0.78	1.82	0.26	0.78				**3.64**
7	Aromatic crops	0.1	0.15		0.5				**0.75**
8	Floriculture	0	0				1.3		**1.3**
	Subtotal of A	**21.81**	**36.16**	**20.02**	**34.23**	**40**	**72.39**	**53.2**	**277.82**
B	**Integrated mushroom unit**							0.7	**0.7**
C	**Creation of water resources**	2.625		9.125	5.88	6.28	14.13	10.63	**48.67**
D	**On Farm Management**	1.355	4	18.955	6.88	16.74	24.79	2.85	**75.57**
E	**On Farm Handling unit**		1.5	2.5	2.5		3		**9.5**
F	**Production of planting unit**		6	2.25	3		6	38	**55.25**
G	**Transfer of Technology**	2.175	1.08	3.46	2.03	1.69	2.35	5.5	**18.285**
H	**Organic farming**	2.5	6.6	5.7	3.7	31.5	15.4	35	**100.4**
I	**Agriculture equipments**	1.53	3.9	8.085	6.3	1.8	6.725	7.3	**35.64**
J	**Integrated pest management**	2.1	2.6	0.81	1.02		1.6		**8.13**
K	**Women development**		2.5	0.5	2.1	1.5	0.9	2.5	**10**
M	**Arecanut Storage tank**				2.9				**2.9**
N	**Centre for excellence passion fruit**				27.8				**27.8**
O	**Technical support**						1.5		**1.5**
P	**Bee Keeping**							1.6	**1.6**
	Grand Total	**34.095**	**64.34**	**71.4**	**98.34**	**99.51**	**148.78**	**157.28**	**673.765**

Source of data: Director of Horticulture, Managing Director (MgSFAC), Meghalaya
Note: There were errors in addition in the source data which were rectified in the table given above

3.6 Findings and Observations

The Evaluation team observed that there was wide appreciation of the manner in which the Technology Mission Programme has been conceived and was being implemented in all the districts of Meghalaya. The overall impact of the Mission is also very much visible in terms of increased level of awareness about the role of horticulture sector in the economy of the region. Though, a clear defined road map needs to be planned for the future to have a greater impact in the field of horticulture sector. The observations and findings have been laid out as follows:

1. **Appropriate agro- climate:** Meghalaya is blessed with diverse agro climatic conditions that are conducive for cultivation of varied horticultural crops round the year. The varied agro-climate is ideal for growing large number of these horticulture crops enabling their

production and availability on a regular basis. Meghalaya holds a vast potential for the development of horticulture.

2. **Expansion of area:** There has been a substantial increase both in area and production of horticulture crops during the Technology Mission on Horticulture. After launching of the TMH, additional area of 25347.5 ha of land has been brought under Horticulture crops, till 2008.

   Area expansion has taken place mostly in case of fruits, vegetables and spices. Among fruits the main benefited crops have been pineapple (2046 ha.), orange (2035 ha.), banana (1870 ha.), peach/ plum (1327 ha.), strawberry (570 ha.), indigenous fruits (330 ha.) and stone fruits (322 ha.) etc.

   Among vegetables 1000 ha land has been used for cultivation of cabbage, carrot, cauliflower, pea, tomato and broccoli. Colored capsicum has come under area expansion of 770 ha. potatoes (360 ha.), cherry tomato (200 ha.) etc.

   Among spices, ginger contributed 1188 ha. turmeric (1018 ha.) and black pepper (849 ha.). Tezpatta/Betel vine (205 ha.) and large cardamom (164 ha.) have also been encouraged. Floriculture has benefited in a couple of districts especially Ri Bhoi (1464 ha) followed by East Garo hills (1346 ha).

   An additional area of 1570 ha has been brought under carnation, 1460 ha under Anthurium and Rose (1355 ha.). Other flowers such as Bird of Paradise, Lilium and Heliconia have also been encouraged. In fact floriculture is a post Mission development in the Region. The additional area brought under various horticulture crops is a direct impact of the support extended by TMH and as a result realizes high productivity level.

3. **Focus on commercial cultivation**: The Technology Mission has made a significant change in the cropping pattern. It has brought about transformation in the production scenario where the indigenously grown fruits, vegetables and flowers are now being commercially cultivated. The region has made an impressive progress in vegetables, cultivation of second crop in a year after paddy, thus helping the growers to earn better returns from same unit area of land. Before the mission mode intervention, horticulture production was largely of the nature of taking cash crops for supplementing farm income.

4. **Impact on Employment Generation:** The Mission's interventions were labour intensive right from the nursery stage to the selling point. These interventions have not only lead to increased productivity and better quality produce but have also generated considerable additional employment. It is estimated that employment has been created for 40% persons by the different phases of mission programmes since the inception of the Technology Mission.

   In addition to this direct employment, indirect employment is also being generated in secondary activities, e.g. transport, packaging, processing etc. The vegetable scenario has started giving quick seasonal economic returns to farmers. Commercial cultivation of flowers such as orchids, anthurium, lilium, roses etc has improved the economy of many farmers besides providing ample employment opportunities for many youth especially women.

5. **Infrastructure facilities:** The infrastructure facilities created such as community water tanks, tube wells, drip irrigation, nurseries, greenhouses, model floriculture centre, vermi-compost units etc. have helped in production and supply of quality planting material and also improving production and productivity of horticulture crops in the region. Infrastructure facilities were also created for improved post harvest management, marketing as well as processing of horticultural produce in almost all the districts. These activities have helped in improving the economy of a majority of the inhabitants of the region, mainly small and marginal farmers.

6. **Monitoring:** As per Evaluation team's observation and information, Monitoring of the programme is done but in a very lackadaisical manner. The Implementing Agency should ensure that more frequent visits are made as visiting the field for spot verification etc. Monitoring by the implementing agency acts as an encouragement to the farmers where they can discuss their problems.

7. **Capacity building:** TMH interventions are accompanied with recent technologies and infrastructure, which can help in enhancing the quantity and quality improvement of various horticulture crops in a commercialized and competitive way. In order to bring about a transformation in the production scenario, it is essential to make the farmers adopt the technologies set under the mission.

   Trainings on various issues have been organized for building the capacity of the farmers. Trainings as well as demonstrations have been carried out for beneficiaries within and outside the state. Trainings have been conducted on the following:

   i. Improvement of production technologies,
   ii. Improvement of crop protection technologies,
   iii. Training on bee-keeping,
   iv. Training on mushroom cultivation,
   v. Training on a particular crop like: fruits, vegetables, flowers, aromatic plants, medicinal, spices, plantation crops (cashew nut) etc.
   vi. Organic farming technologies,
   vii. Use of agriculture implements,
   viii. Training on processing or value addition,
   ix. Nursery raising
   x. Training on women self help groups.

The effectiveness of horticulture efforts has been increased through training organized for both the staff and farmers. The response portrayed is quite visible in terms of increased level of awareness about the importance of agricultural sector in the economy of the region.

CHAPTER IV

Incidence of benefits for the beneficiaries

4.1 Introduction

In the previous chapter, scheme wise physical and financial target achievement in different districts of Meghalaya was presented. In this chapter, utilization of the schemes by the beneficiaries and the type of agriculture and economic benefits accrued by the beneficiaries through the schemes will be analysed. The chapter consists of profile of selected beneficiaries, type of assistance given to the beneficiaries and type of utilization of those assistances and benefits emerged out of utilization of scheme assistances.

4.2 Sample Profile

A total of 350 respondents were selected through systematic random sampling method from 7 districts. A total of 50 respondents were selected from each district. Scheme wise, the respondents were selected from all 17 main schemes which were having ongoing programme components.

4.2.1 Beneficiary profile

Out of 350 respondents, 218 were males and 132 were females. 53% respondents belonged to 35-60 years age group, 37% respondents belonged to 18-35 years age group and remaining 10% were above 60 years (Table 4.1).

Caste composition of the respondents showed that 100% beneficiaries were of tribal origin i.e. (44% Garo Tribes, 41.71% Khasi tribes and remaining 14.29% were other Jaintia tribes).

All the respondents were Christians (Table 4.1).

Table 4.1 Social profile of the respondents

Particular	District							Total
	East Khasi Hills	West Khasi Hills	Jaintia Hills	Ri-Bhoi	East Garo Hills	West Garo Hills	South Garo Hills	
Respondents	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**350 (100)**
Sex								
Male	26 (52.00)	29 (58.00)	29 (58.00)	22 (44.00)	42 (84.00)	37 (74.00)	33 (66.00)	218 (62.29)
Female	24 (48.00)	21 (42.00)	21 (42.00)	28 (56.00)	8 (16.00)	13 (26.00)	17 (34.00)	132 (37.71)
Sub Total	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**350 (100)**
Age Group								
18 to 35	13 (26.00)	18 (36.00)	24 (48.00)	17 (34.00)	21 (42.00)	13 (26.00)	22 (44.00)	128 (36.57)

35 to 60	34 (68.00)	23 (46.00)	22 (44.00)	29 (58.00)	24 (48.00)	29 (58.00)	23 (46.00)	184 (52.57)
> 60	3 (6.00)	9 (18.00)	4 (8.00)	4 (8.00)	5 (10.00)	8 (16.00)	5 (10.00)	38 (10.86)
Sub Total	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**350 (100)**
Average Age (yrs)	43.64	44.00	40.32	41.02	40.50	45.62	37.90	**41.86**
Caste								
ST (Khasi)	44 (88.00)	50 (100)	0	50 (100)	2 (4.00)	0	0	146 (41.71)
ST (Garo)	6 (12.00)	0	0	0	48 (96.00)	50 (100)	50 (100)	154 (44.00)
ST (Jaintia)	0	0	50 (100)	0	0	0	0	50 (14.29)
Sub Total	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**350 (100)**
Religion								
Christian	50 (100)	50 (100)	50 (100)	50 (100)	50 (100)	50 (100)	50 (100)	350 (100)
Sub Total	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**350 (100)**

Figures within parenthesis are in percentage

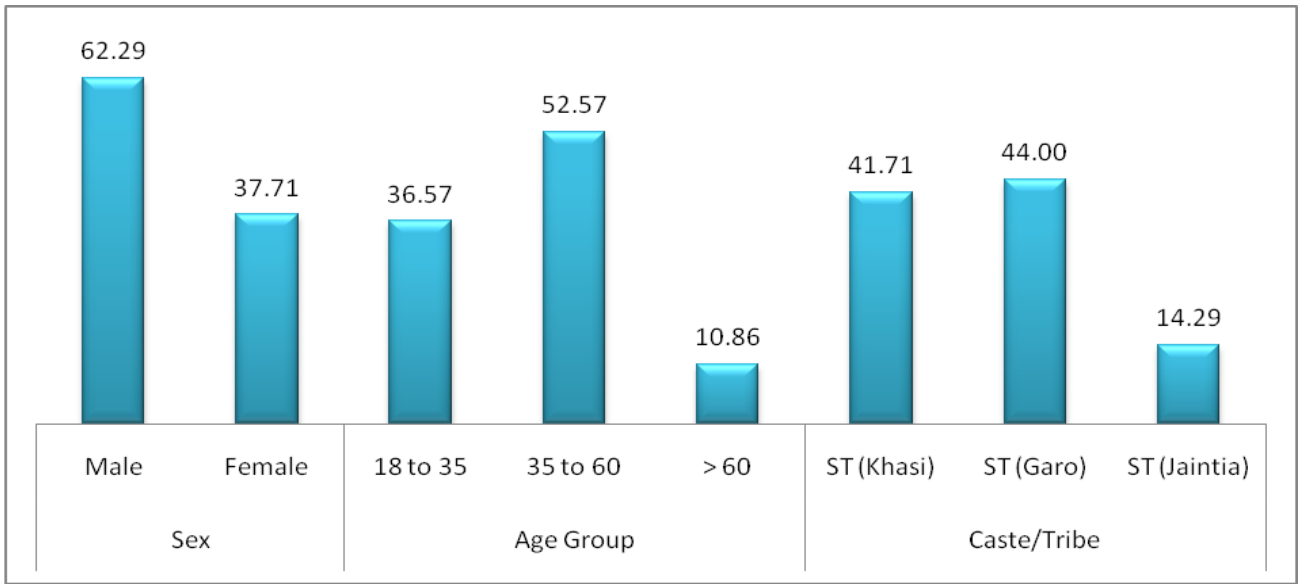


Fig. 4.1 Social profile of the respondents (in %age)

4.2.2 Beneficiaries Economic Profile

Nearly 31% respondents were Below Poverty Line (BPL) and 69% respondents were above poverty line (APL) (Table 4.2). Respondent's income analysis showed that nearly 19% respondents had less than ₹ 20,000 annual income, 27% respondents had between ₹ 20-40 thousand annual income, 34% respondents had between ₹ 40-60 thousand annual income, and

remaining 20% 27% respondents had above ₹ 60 thousand annual income. The average annual income of beneficiary households was found to be **₹ 46399.15/-**

Table 4.2 Economic profile of the respondents

Economic Class	District							Total
	East Khasi Hills	West Khasi Hills	Jaintia Hills	Ri-Bhoi	East Garo Hills	West Garo Hills	South Garo Hills	
APL	10 (20.00)	31 (62.00)	32 (64.00)	45 (90.00)	33 (66.00)	43 (86.00)	49 (98.00)	243 (69.43)
BPL	40 (80.00)	19 (38.00)	18 (36.00)	5 (10.00)	17 (34.00)	7 (14.00)	1 (2.00)	107 (30.57)
Sub Total	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**350 (100)**
Pre Project Annual Household Income (₹ 000)								
< 20	22 (44.00)	20 (40.00)	6 (12.00)	0 (0)	9 (18.00)	4 (8.00)	5 (10.00)	**66 (18.86)**
20 - 40	18 (36.00)	18 (36.00)	19 (38.00)	8 (16.00)	18 (36.00)	8 (16.00)	4 (8.00)	**93 (26.57)**
40 - 60	9 (18.00)	10 (20.00)	23 (46.00)	24 (48.00)	11 (22.00)	17 (34.00)	26 (52.00)	**120 (34.29)**
> 60	1 (2.00)	2 (4.00)	2 (4.00)	18 (36.00)	12 (24.00)	21 (42.00)	15 (30.00)	**71 (20.29)**
Sub Total	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**350 (100)**
Average Income (₹)	**26870.00**	**32560.0**	**40860.00**	**61400.00**	**64910.00**	**60420.00**	**58214.00**	**46399.15**

Figures within parenthesis are in percentage

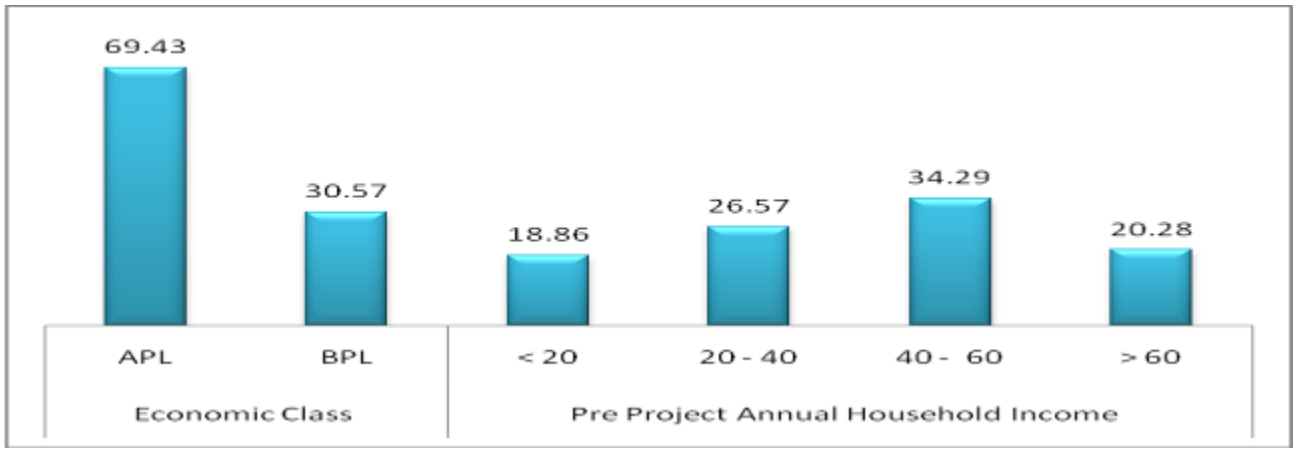


Fig 4.2 Economic profile of the respondents (in %age)

4.2.3 Occupation details

The majority of respondent in the blocks surveyed were found dependent purely on agriculture, i.e. 238 (68%) respondents followed by the beneficiaries involvement in as agriculture labour 45 (13%). The third major category of respondent was from the government service 17 (5%). Under the main occupation the number and percentage in non-agricultural activities 8 (2.3%), business or shop 22 (6.3), private service only 3 (0.86%), fishery 8 (2.3%), selling firewood 1 (0.29%), mason 2 (0.57%), weavers 1 (0.29%), electrician 2 and in country liquor business 3 respondents were there. Respondents opting the above as subsidiary occupation were agriculture labour 74(24.58%), agriculture 104(34.55%), collection & trading in forest produce 18(5.98%), business & shop owners 38(12.62%), private service 14 (4.65%), non-agriculture labour 13(4.32%), fishery 13(4.32%), country liquor business 11(3.65%), government service 5(1.66%), electrician trade (6), tailoring (3) and selling fire wood (2) respectively (Table 4.3).

Table 4.3 Occupational profile of the respondents

Particulars	District							Total
	East Khasi Hills	West Khasi Hills	Jaintia Hills	Ri-Bhoi	East Garo Hills	West Garo Hills	South Garo Hills	
Main Occupation								
Agriculture	45 (90.00)	29 (58.00)	42 (84.00)	46 (92.00)	17 (34.00)	33 (66.00)	26 (52.00)	**238 (68.00)**
Agriculture Labour	0	9 (18.00)	2 (4.00)	2 (4.00)	9 (18.00)	13 (26.00)	10 (20.00)	**45 (12.86)**
Non-Agriculture Labour	1 (2.00)	1 (2.00)	1 (2.00)	0	4 (8.00)	1 (2.00)	0	**8 (2.29)**
Business or Shop	0	5 (10.00)	1 (2.00)	0	10 (20.00)	2 (4.00)	4 (8.00)	**22 (6.29)**
Private service	0	0	0	0	3 (6.00)	0	0	**3 (0.86)**
Govt. Service	1 (2.00)	4 (8.00)	1 (2.00)	2 (4.00)	4 (8.00)	1 (2.00)	4 (8.00)	**17 (4.86)**
Fishing	1 (2.00)	1 (2.00)	0	0	0	0	6 (12.00)	**8 (2.29)**
Selling firewood	0	0	0	0	1 (2.00)	0	0	**1 (0.29)**
Mason	0	0	0	0	2 (4.00)	0	0	**2 (0.57)**
Weavers	0	0	1 (2.00)	0	0	0	0	**1 (0.29)**
Electrician	1 (2.00)	0	1 (2.00)	0	0	0	0	**2 (0.57)**
Country liquor business	1 (2.00)	1 (2.00)	1 (2.00)	0	0	0	0	**3 (0.86)**
Total	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**50 (100)**	**350 (100)**
Subsidiary Occupation								
Agriculture	5 (14.71)	21 (56.76)	2 (5.56)	4 (8.00)	31 (64.58)	17 (34.00)	24 (52.17)	**104 (34.55)**
Agriculture	16	4	17	10	4	15	8	**74**

Labour	(47.06)	(10.81)	(47.22)	(20.00)	(8.33)	(30.00)	(17.39)	**(24.58)**
Non-Agriculture Labour	2 (5.88)	1 (2.70)	3 (8.33)	0	1 (2.08)	1 (2.00)	5 (10.87)	**13 (4.32)**
Business or Shop	4 (11.76)	3 (8.11)	4 (11.11)	15 (30.00)	4 (8.33)	6 (12.00)	2 (4.35)	**38 (12.62)**
Private service	0	2 (5.41)	1 (2.78)	7 (14.00)	2 (4.17)	2 (4.00)	0	**14 (4.65)**
Govt. Service	0	0	0	4 (8.00)	0	1 (2.00)	0	**5 (1.66)**
Fishing	3 (8.82)	1 (2.70)	1 (2.78)	1 (2.00)	2 (4.17)	1 (2.00)	4 (8.70)	**13 (4.32)**
Selling firewood	0	0	0	0	1 (2.08)	0	1 (2.17)	**2 (0.66)**
Tailoring	0	0	0	2 (4.00)	0	1 (2.00)	0	**3 (1.00)**
Electrician	1 (2.94)	0	4 (11.11)	0	1 (2.08)	0	0	**6 (1.99)**
Collection and trading in forest produces	2 (5.88)	3 (8.11)	3 (8.33)	3 (6.00)	2 (4.17)	5 (10.00)	0	**18 (5.98)**
Country liquor business	1 (2.94)	2 (5.41)	1 (2.78)	4 (8.00)	0	1 (2.00)	2 (4.35)	**11 (3.65)**
Total	**34 (100)**	**37 (100)**	**36 (100)**	**50 (100)**	**48 (100)**	**50 (100)**	**46 (100)**	**301 (100)**

Figures within parenthesis are in percentage

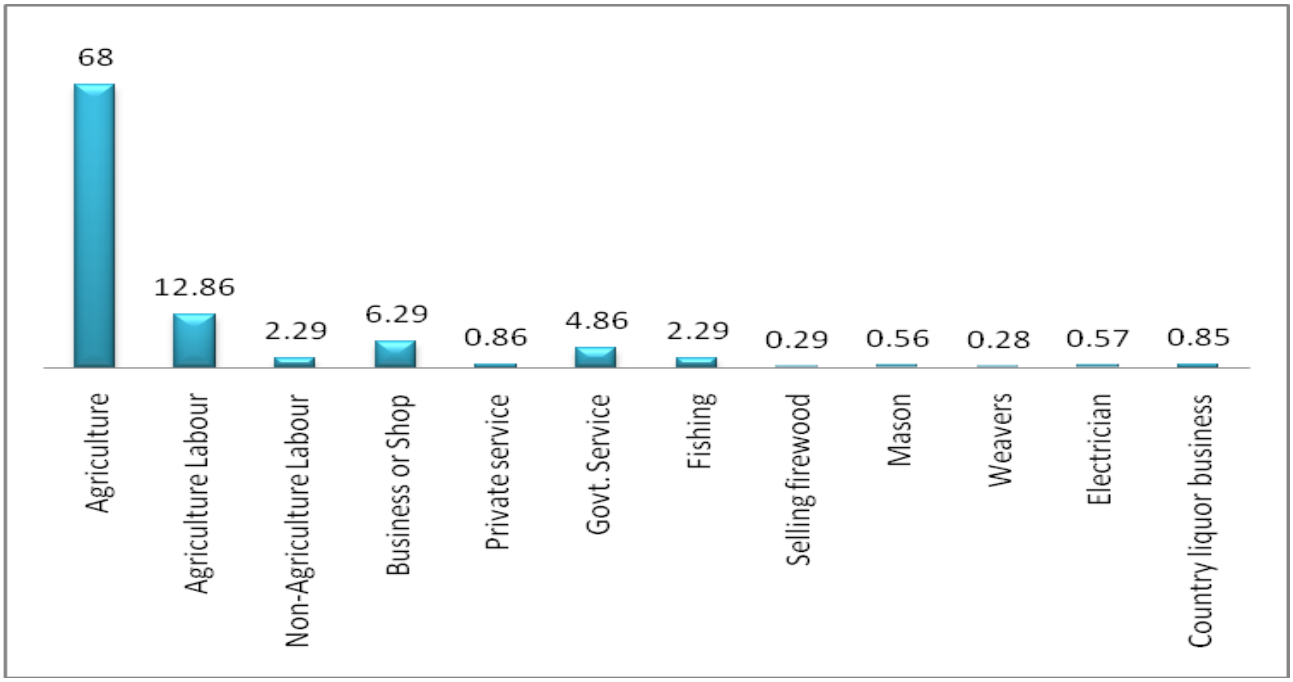


Fig 4.3 Main occupation of the respondents

4.3 Incidence of benefits from TMH

Incidence of benefits from TMH were assessed in terms of (i) Training and demonstration for capacity building, (ii) Scheme assistances, (iii) Utilization of scheme assistances and (iv) Benefits emerging out of scheme assistance utilization. Assessment of incidence of benefits under above mentioned headings are discussed below.

4.3.1 Training and demonstration for capacity building

A. Trainings: Under the technology mission ten (10) kinds of trainings were provided to the beneficiaries. These trainings included (1) Improvement of production technologies, (2) Improvement of crop protection technologies (IPM), (3) Training on bee-keeping, (4) Training on mushroom cultivation, (5) Training on any particular crop like: fruits, vegetables, flowers, aromatic plants, medicinal, spices, plantation crops (cashew nut) etc., (6) Organic farming technologies, (7) Use of agriculture implements, (8) Training on processing or value addition, (9) Nursery Raising, (10) Training on women self help groups. Several respondents attended more than one training programmes. For this reasons 350 respondents total attendance in all 10 programmes became 531. 87 respondents received training on improvement of production technologies, 50 on improvement of crop protection technologies (IPM), 8 received training on bee-keeping, 32 of respondents received training on mushroom cultivation, 132 respondents were trained on any particular crop like: fruits, vegetables, flowers, aromatic plants, medicinal, spices, plantation crops (cashew nut) etc., 63 received training on organic farming technologies, 50 on use of agriculture implements, 16 respondents were trained on processing or value addition, 33 on nursery raising and 60 of respondents received training on women self help groups for the production & popularisation of horticulture among women (Table 4.4).

B. Demonstrations: Similarly five types of field demonstrations were attended by the respondents. These are demonstration on (i) use of vermin compost, (ii) new improved crop technology, (iii) poly house/green house & low cost tunnel technology, (iv)Integrated pest management technology and (v) certification on organic farming produce. Altogether 203 respondents attended the demonstration programmes. Out of which 65 respondents each attended vermin compost demonstration and new cropping technology, 28 respondents attended Poly house/ Green house/ Low cost Tunnel, etc. demonstration, 16 respondents attended IPM and 29 respondents attended Certification of organic farming demonstration (Table 4.5).

Table 4.4 No. of respondents attended capacity building trainings under TMH

Sl. No.	Training programmes	District							Total
		East Khasi Hills	West Khasi Hills	Jaintia Hills	Ri-Bhoi	East Garo Hills	West Garo Hills	South Garo Hills	
1.	Improvement of production technologies	22 (21.57)	16 (19.51)	6 (18.75)	11 (8.87)	6 (12.77)	10 (13.33)	16 (23.19)	**87 (16.38)**
2.	Improvement of crop protection technologies (IPM)	11 (10.78)	11 (13.41)	2 (6.25)	6 (4.84)	8 (17.02)	6 (8.00)	6 (8.70)	**50 (9.42)**
3.	Bee-keeping	2 (1.96)	1 (1.22)	0	1 (0.81)	1 (2.13)	1 (1.33)	2 (2.90)	**8 (1.51)**
4.	Mushroom cultivation	9 (8.82)	4 (4.88)	6(18.75)	4 (3.23)	2 (4.26)	3 (4.00)	4 (5.80)	**32(6.03)**
5.	Various crop	16 (15.69)	19 (23.17)	6 (18.75)	37 (29.84)	12 (25.53)	20 (26.67)	22 (31.88)	**132 (24.86)**

6.	Organic farming	6 (5.88)	4 (4.88)	2 (6.25)	29 (23.39)	5 (10.64)	13 (17.33)	4 (5.80)	**63 (11.86)**
7.	Use of agriculture implements	6 (5.88)	6 (7.32)	4 (12.50)	19 (15.32)	6 (12.77)	9 (12.00)	0	**50 (9.42)**
8.	Processing/ value addition	4 (3.92)	3 (3.66)	1 (3.13)	2 (1.61)	1 (2.13)	3 (4.00)	2 (2.90)	**16 (3.01)**
9.	Nursery Raising	13 (12.75)	8 (9.76)	3 (9.38)	2 (1.61)	1 (2.13)	4 (5.33)	2 (2.90)	**33 (6.21)**
10.	Self Help Groups	13 (12.75)	10 (12.20)	2 (6.25)	13 (10.48)	5 (10.64)	6 (8.00)	11 (15.94)	**60 (11.30)**
Total		**102 (100)**	**82 (100)**	**32 (100)**	**124 (100)**	**47 (100)**	**75 (100)**	**69 (100)**	**531 (100)**

Figures within parenthesis are in percentage

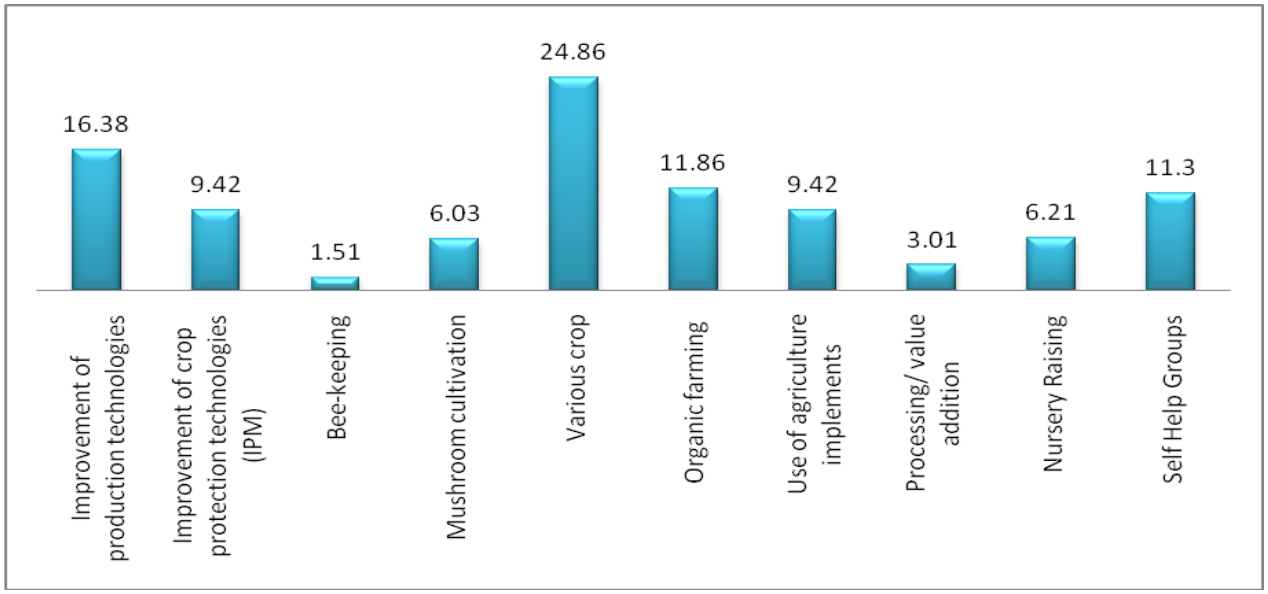


Fig 4.4 No. of respondents attended capacity building trainings under TMH

Table 4.5 No. of respondents who attended demonstration of new technologies and practices under TMH

Sl. No.	Demonstration programme	District							Total
		East Khasi Hills	West Khasi Hills	Jaintia Hills	Ri-Bhoi	East Garo Hills	West Garo Hills	South Garo Hills	
1.	Vermi-compost	8 (23.53)	8 (24.24)	1 (20.00)	18 (36.73)	6 (31.58)	9 (31.03)	15 (44.12)	**65 (32.02)**
2.	New cropping Tech	12 (35.29)	11 (33.33)	1 (20.00)	22 (44.90)	3 (15.79)	14 (48.28)	2 (5.88)	**65 (32.02)**
3.	Poly house/ Green house/ Low cost Tunnel, etc.	4 (11.76)	6 (18.18)	1 (20.00)	2 (4.08)	6 (31.58)	1 (3.45)	8 (23.53)	**28 (13.79)**
4.	Crop Protection (IPM, Bird protection net, Anti hail nets)	4 (11.76)	4 (12.12)	2 (40.00)	2 (4.08)	3 (15.79)	1 (3.45)	0	**16 (7.88)**
5.	Certification on	6	4	0	5	1	4	9	**29**

	organic farming	(17.65)	(12.12)	(0.00)	(10.20)	(5.26)	(13.79)	(26.47)	**(14.29)**
Total		**34 (100)**	**33 (100)**	**5 (100)**	**49 (100)**	**19 (100)**	**29 (100)**	**34 (100)**	**203 (100)**

Figures within parenthesis are in percentage

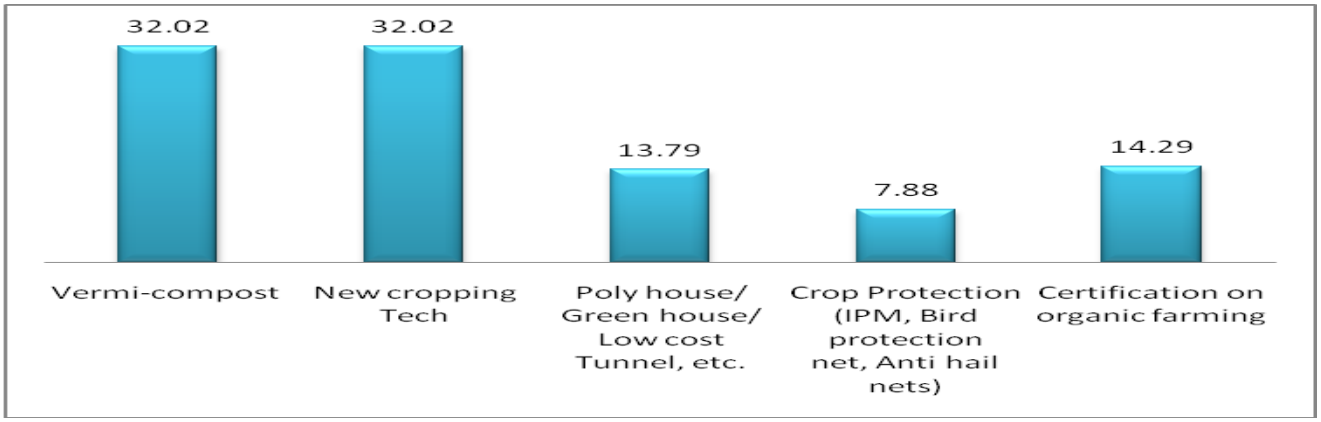


Fig 4.5 No of respondents attended demonstration programmes under TMH

4.3.2 Types of assistances

The assistance provided to the beneficiaries are both in the nature of cash and kind, apart from these, regular monitoring and on farm trials, demonstrations and training have added much for the success of the TM in this region.

A. Assistance in cash: Cash assistances were given for most of 74 programme components of TMH. Cash assistances varied from ₹ 600/unit (Bee keeping) to ₹ 9 lakhs/unit (for Big nursery in public sector). Altogether 350 respondents received 403 number cash assistances. Several respondents received cash assistances for more than one scheme.

Out of 403, 167 number cash assistances were received for horticulture crop area expansion, 20 for non horticulture crop expansion, 24 for IPM, 14, 23, and 29 number were respectively for Plastic culture, nursery raising and agricultural implements, 31 for emergency pest control, 32 for new irrigation system, 21 for bird protection and others, 14 for community irrigation, 2 each for cold storage and processing units and 24 for miscellaneous purposes (Table 4.6).

B. Assistance in kind: Altogether 365 number of scheme assistances were given in kinds to 350 respondents. Like cash assistance, number of respondents received scheme assistance in kind for more than one scheme. Scheme wise 248 respondents received seeds and planting materials, 53 respondents received agriculture implements, 53 respondents received fertilisers, insecticides and pesticides, and 11 respondents received other agriculture inputs. The assistance in kinds included seed, FYM, plant protection materials, trellis (crossed bamboo) for staking vegetable crops, for flowers like orchids & roses plants, pot and pot mixture, neem cake, bone meal, poly shade etc., for turmeric crop quality rhizomes etc..

Table 4.6 Number of respondents who received cash assistances from the scheme

Sl. No	Particulars	District							Total
		East Khasi Hills	West Khasi Hills	Jaintia Hills	Ri-Bhoi	East Garo Hills	West Garo Hills	South Garo Hills	
1.	Area expansion under horticulture crops	27 (35.06)	30 (37.97)	21 (63.64)	14 (24.14)	22 (37.93)	22 (45.83)	31 (62.00)	**167 (41.44)**
2.	Area expansion under non-horticulture crops	4 (5.19)	5 (6.33)	1 (3.03)	2 (3.45)	3 (5.17)	1 (2.08)	4 (8.00)	**20 (4.96)**
3.	Integrated pest management (IPM)	5 (6.49)	5 (6.33)	1 (3.03)	4 (6.90)	6 (10.34)	3 (6.25)	0	**24 (5.96)**
4.	Plasti-culture	3 (3.90)	4 (5.06)	1 (3.03)	2 (3.45)	3 (5.17)	1 (2.08)	0	**14 (3.47)**
5.	Nursery (Small or Big)	4 (5.19)	7 (8.86)	1 (3.03)	2 (3.45)	3 (5.17)	2 (4.17)	4 (8.00)	**23 (5.71)**
6.	Agriculture implements	5 (6.49)	5 (6.33)	1 (3.03)	13 (22.41)	1 (1.720	4 (8.33)	0	**29 (7.20)**
7.	Emergent needs like crop failures or pest attack	4 (5.19)	4 (5.06)	1 (3.03)	11 (18.97)	4 (6.90)	6 (12.50)	1 (2.00)	**31 (7.69)**
8.	Irrigation systems (Drip irrigation, sprinkler irrigation system)	6 (7.79)	6 (7.59)	3 (9.09)	4 (6.90)	8 (13.79)	4 (8.33)	1 (2.00)	**32 (7.94)**
9.	Any other purpose (shade net house, bird protection nets, anti hail nets)	5 (6.49)	6 (7.59)	1 (3.03)	2 (3.45)	4 (6.90)	1 (2.08)	2 (4.00)	**21 (5.21)**
10	Irrigation sources (community tank and tube wells)	4 (5.19)	4 (5.06)	1 (3.03)	1 (1.72)	2 (3.45)	0	2 (4.00)	**14 (3.47)**
11	Cold storage units	2 (2.60)	0	0	0	0	0	0	**2 (0.50)**
12	Processing units	2 (2.60)	0	0	0	0	0	0	**2 (0.50)**
13	Any other assets	6 (7.79)	3 (3.80)	1 (3.03)	3 (5.17)	2 (3.45)	4 (8.33)	5 (10.00)	**24 (5.96)**
Total		**77 (100)**	**79 (100)**	**33 (100)**	**58 (100)**	**58 (100)**	**48 (100)**	**50 (100)**	**403 (100)**

Figures within parenthesis are in percentage

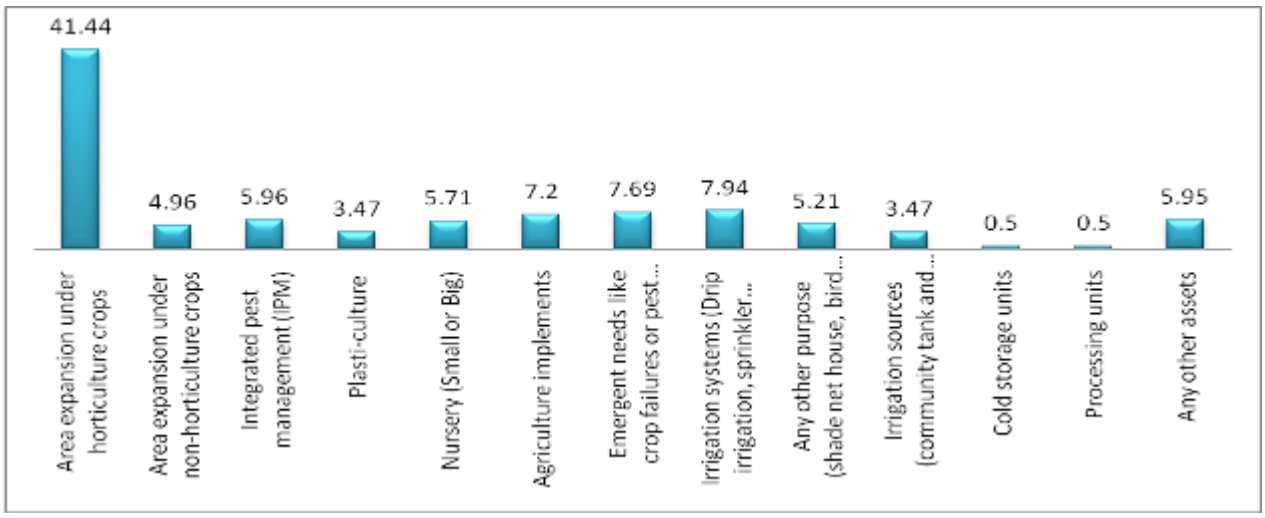


Fig 4.6 Number of respondents who received cash assistances from the scheme

Table 4.7 Number of respondents who received the scheme in kind

S. No.	Particulars	District							Total
		East Khasi Hills	West Khasi Hills	Jaintia Hills	Ri-Bhoi	East Garo Hills	West Garo Hills	South Garo Hills	
1.	Seeds and planting materials	28 (50.00)	37 (62.71)	31 (86.11)	43 (76.79)	37 (64.91)	40 (67.80)	32 (76.19)	**248** (67.95)
2.	Agriculture implements	12 (21.43)	10 (16.95)	2 (5.56)	6 (10.71)	9 (15.79)	9 (15.25)	5 (11.90)	**53** (14.52)
3.	Fertilisers, Insecticides and pesticides	12 (21.43)	10 (16.95)	2 (5.56)	6 (10.71)	9 (15.79)	9 (15.25)	5 (11.90)	**53** (14.52)
4.	Any other agriculture inputs	4 (7.14)	2 (3.39)	1 (2.78)	1 (1.79)	2 (3.51)	1 (1.69)	0	**11** (3.01)
Total		**56 (100)**	**59 (100)**	**36 (100)**	**56 (100)**	**57 (100)**	**59 (100)**	**42 (100)**	**365 (100)**

Figures within parenthesis are in percentage

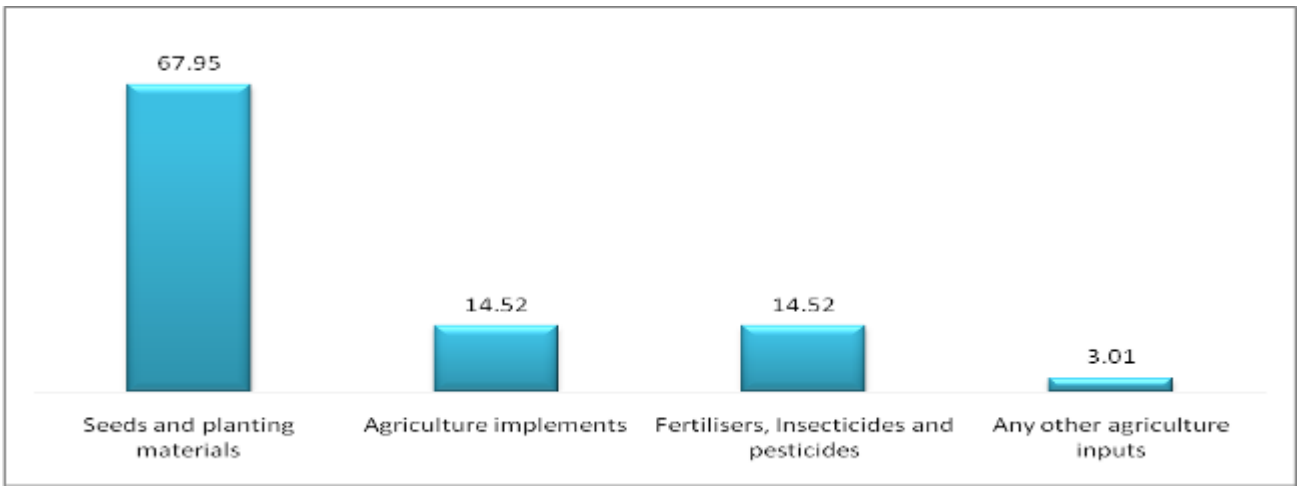


Fig 4.7 No of respondents who received scheme assistance in kinds (in %age)

4.3.3 Types of utilization

Scheme assistances were utilized for production enhancement of mainly horticulture produces. Utilization of scheme assistances are measured in terms of (a) Area or unit expansion under TMH per respondent, (b) Annual production under TMH scheme per respondents and (c) Number of employment days generated under TMH schemes per respondent.

A. Area or unit expansion: On an average, area under TMH schemes per respondent compared to pre project (TMH) period has increased by 393.28% for Spices, medicinal and aromatic plants followed by 313.65% for Vegetables, 178.96% for Floriculture, 161.92% for Fruits, 61.09% for Plantation crops, and 52.76% for organic farming. For Bee Keeping average production unit under TMH compared to pre project period has increased by 578% (Table 4.8).

B. Production: On an average total production under TMH schemes per respondent compare to pre project (TMH) period has increased by 215% for Fruits followed by 178.66% for Floriculture, 157% for Spices & Medicinal plants, 106.33% for Vegetables, and 52.61% for organic farming. For Bee Keeping average honey production under TMH compared to pre project period has increased by 578.44% (Table 4.9).

C. Employment days: On an average total employment days generated under TMH schemes per respondent compare to pre project (TMH) period has increased by 578% for Bee Keeping followed by 393% for Spices & Medicinal plants etc., 314% for Vegetables, 179% for Floriculture, 162% for Fruits, 100% each for Nursery raising, Power tiller and Disel Engine, 61% for plantation crops and 53% for Organic Farming (Table 4.10).

Table 4.8 Respondent and scheme wise average total area under TMH (Acre or units)

Schemes	Respondents	Average area (acre or unit /respondents)		
		Pre Project	Post Project	% Increase
Fruits	54	2.26	5.92	161.92
Floriculture	38	2.45	6.83	178.96
Plantation Crops	27	6.48	10.44	61.09
Vegetables	53	2.49	5.15	313.65
Spices, Medicinal & Aromatic Plants	23	1.20	3.09	393.28
Organic Farming	19	1.62	2.47	52.76
Bee Keeping (Unit/respondent)	7	1.61	10.92	578.42

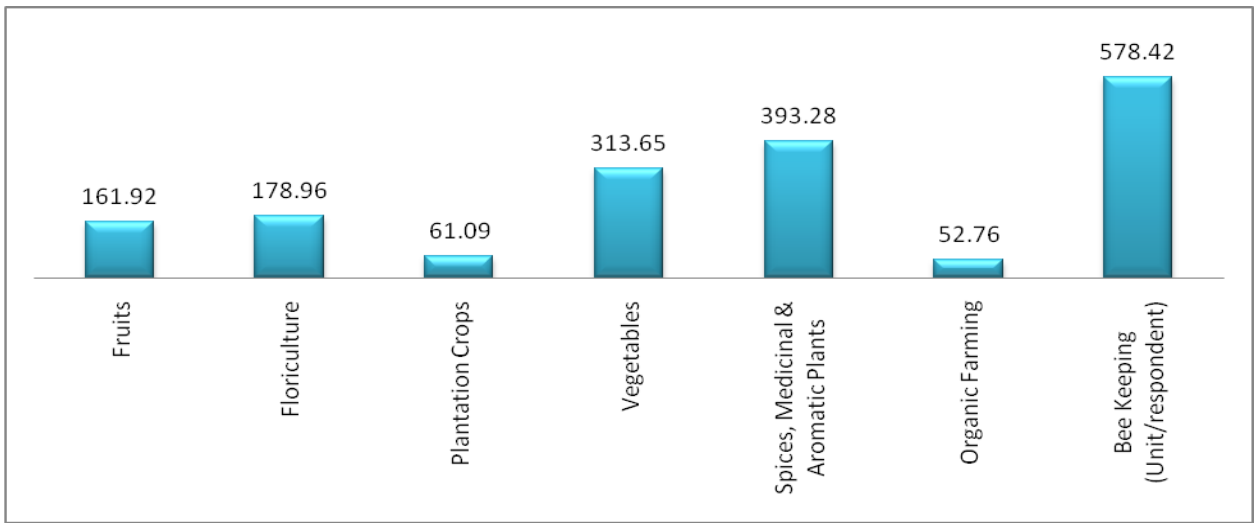


Fig. 4.8 Respondent and scheme wise percentage increase in average total area or unit of production under TMH compared to pre project period

Table 4.9 Respondent and scheme wise average total production per year (Kg/year)

Schemes	Respondents	Average total production (kg/year/respondent)		
		Pre Project	Post Project	% Increase
Fruits	54	225.50	710.32	215.00
Floriculture	38	257.53	717.64	178.66
Plantation Crops	27	259.17	521.94	101.39
Vegetables	53	249.62	514.99	106.31
Spices, Medicinal & Aromatic Plants	23	84.29	216.52	156.88
Organic Farming	19	81.08	123.74	52.61
Bee Keeping	7	11.27	76.46	578.44

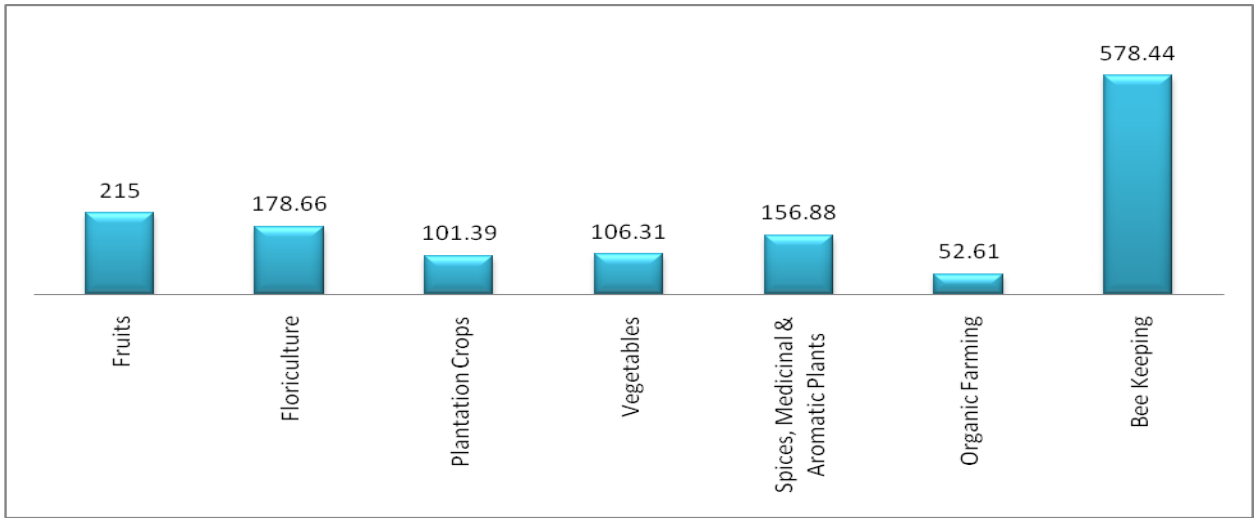


Fig. 4.9 Respondent and scheme wise percentage increase in average total production under TMH schemes compared to pre project period

Table 4.10 Respondent and scheme wise average number of employment days generated

Schemes	Respondents	Average number of employment days (days/respondents)		
		Pre Project	Post Project	% Increase
Fruits	54	248.60	651.13	161.92
Floriculture	38	443.45	1237.07	178.96
Plantation Crops	27	712.80	1148.27	61.09
Vegetables	53	450.69	1864.29	313.65
Spices, Medicinal & Aromatic Plants	23	180.00	887.90	393.28
Organic Farming	19	64.80	98.99	52.76
Bee Keeping (Unit/respondent)	7	28.98	196.60	578.42
Production of planting material (nursery)	18	0	180	100
Power Tiller	27	0	140	100
Diesel Engine	20	0	140	100

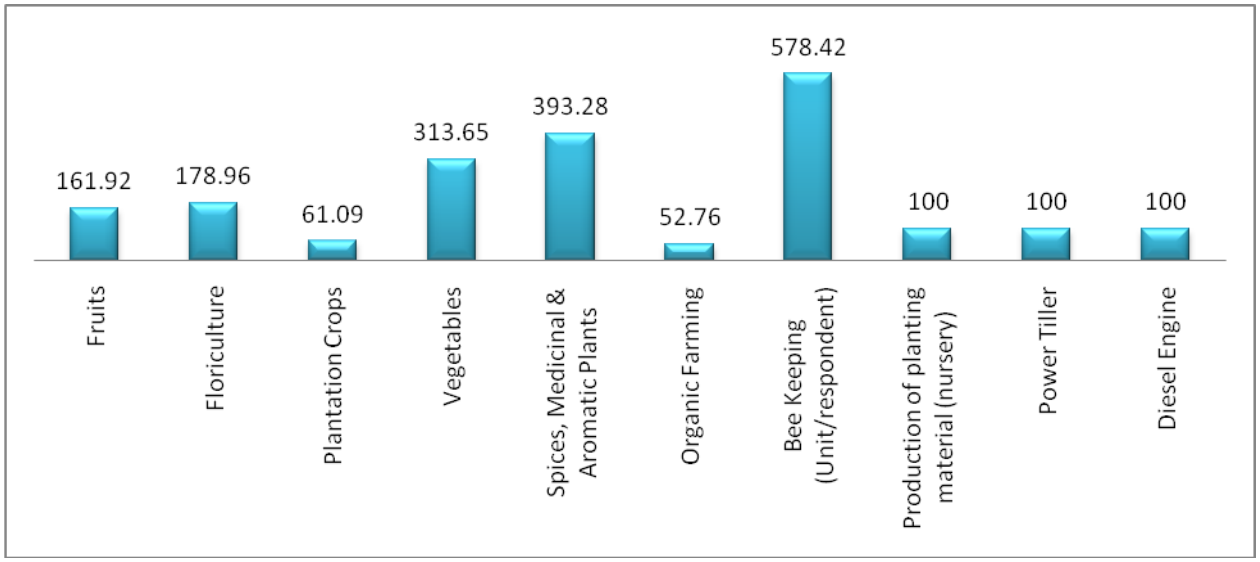


Fig. 4.10 Respondent and scheme wise increase in average number of employment days generated under TMH schemes compared to pre project period

4.4 Accrued benefits of the respondents

Economic benefits:

A.The average annual income of all the 350 beneficiaries during Pre Project Period was reported to be Rs 46,399.15. Out of 350 beneficiaries, only 282 beneficiaries were benefitted by the production output emerged out of the scheme utilization. The average Post Project income of these 282 beneficiaries were found to be Rs 60,578.17.This showed a growth of 30.56% in the annual income of the beneficiaries during Post project over Pre project income (Table 4.11).

B. Other benefits: Besides income enhancements respondents also benefited by (i) Collective marketing facilities through co-operatives/ farmer's groups/ SHGs (12.32% respondents), (ii)

Transportation facilities (34.78%), (iii) Linkages with processing units (4.35%), (iv,) Women's Development Interventions (16.67%), (v) Access to Laboratories and IPM facilities (10.14%), and other benefits (24.74%) (Table 4.11)

Table 4.11 Scheme wise average economic enhancement for the respondents (in ₹)

Schemes	Respondents	Average annual income (₹)		
		Pre Project	Post Project	% Increase
Fruits	54	50111.11	75166.25	49.99
Floriculture	38	57228.95	75940.26	32.7
Plantation Crops	27	57592.59	66278.01	15.08
Vegetables	53	55471.70	65396.60	17.89
Spices, Medicinal & Aromatic Plants	23	51086.96	56239.49	10.09
Use of Plastic-Culture	17	42647.06	-	-
Creation of Water Resources	6	50000.00	-	-
On Farm Water Management	26	53442.31	-	-
Production of Planting materials	8	30000.00	35921.63	19.74
Transfer of technology	43	39546.51	-	-
Organic Farming	19	54052.63	65993.19	22.09
Agriculture Equipments	10	31100.00	-	-
Bee Keeping	7	37571.43	43689.95	16.29
Farm handling units	19	39736.84	-	-
Total	**350**	**46399.15**	**60578.17**	**30.56**

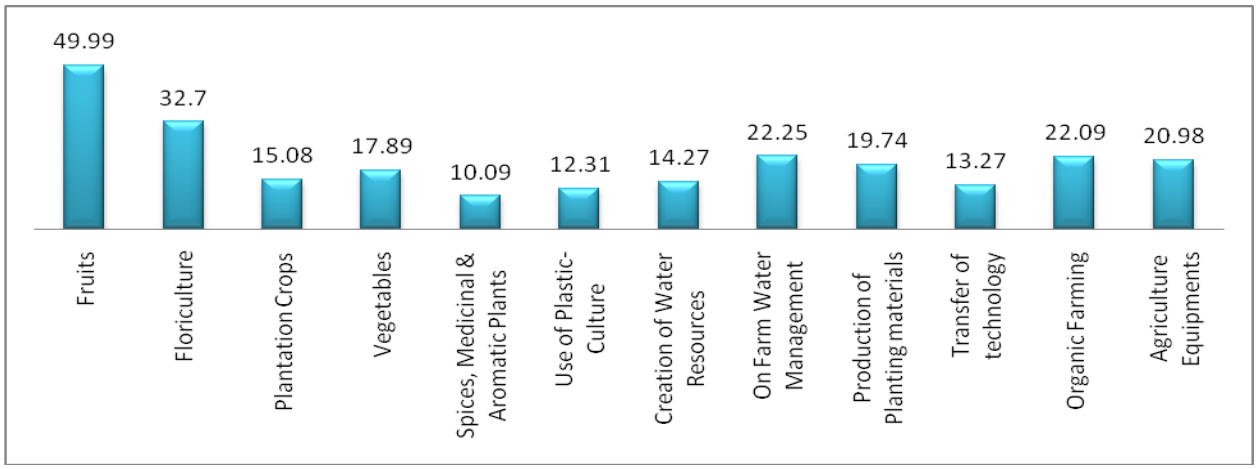


Fig 4.11 Scheme wise average economic enhancement for the respondents

Table 4.12 Other benefits accrued by the respondents under TMH

S. No.	Particulars	District							Total
		East Khasi Hills	West Khasi Hills	Jaintia Hills	Ri-Bhoi	East Garo Hills	West Garo Hills	South Garo Hills	
1	Collective marketing facilities through co-operatives/ farmer's groups/ SHGs	2 (6.90)	4 (14.29)	0	2 (9.52)	6 (31.58)	2 (8.33)	1 (5.88)	**17 (12.32)**
2	Transportation facilities made available	6 (20.69)	10 (35.71)	0	3 (14.29)	10 (52.63)	9 (37.50)	10 (58.82)	**48 (34.78)**
3	Linkages with processing units	0	0	0	2 (9.52)	0	2 (8.33)	2 (11.76)	**6 (4.35)**
4	Women's Development Interventions (Formation of SHGs)	5 (17.24)	3 (10.71)	0	8 (38.10)	1 (5.26)	4 (16.67)	2 (11.76)	**23 (16.67)**
5	Availability of and access to laboratories facilities for leaf analysis, IPM, Tissue culture, plant health clinic, etc.	6 (20.69)	3 (10.71)	0	2 (9.52)	0	3 (12.50)	0	**14 (10.14)**
6	Any other benefits/ schemes	10 (34.48)	8 (28.57)	0	4 (19.05)	2 (10.53)	4 (16.67)	2 (11.76)	**30 (21.74)**
Total		**29 (100)**	**28 (100)**	**0**	**21 (100)**	**19 (100)**	**24 (100)**	**17 (100)**	**138 (100)**

Figures within parenthesis are in percentage

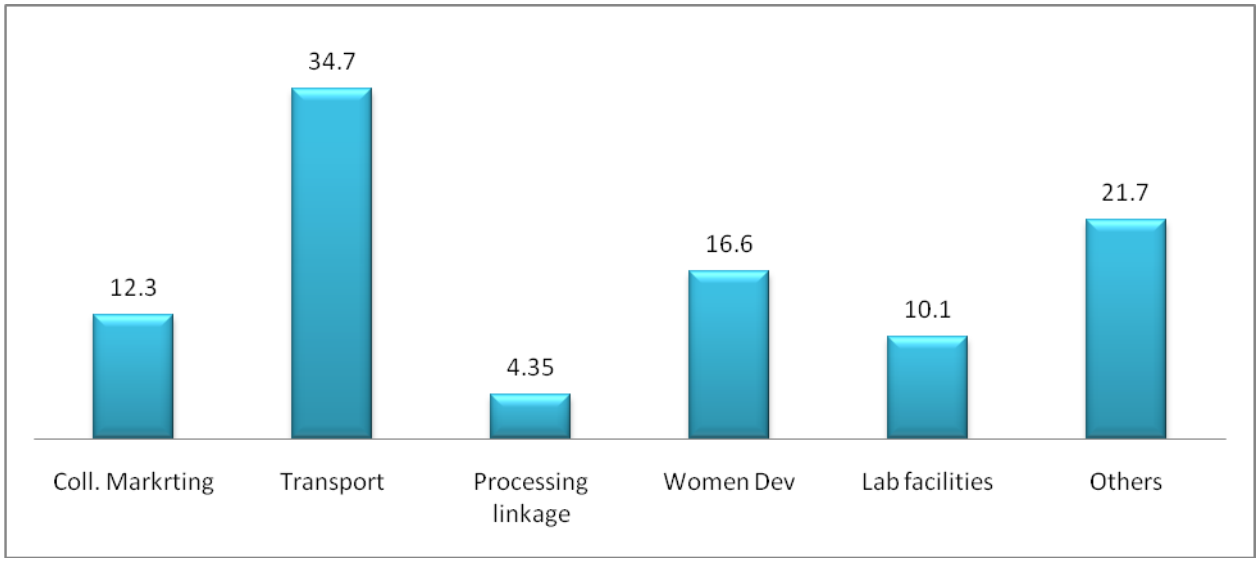


Fig. 4.12 Nature of various benefits received by the respondents under the TMH

4.5 Summary

A. Sample

1. A total of 350 respondents were selected through systematic random sampling method from 7 districts for the evaluation study.
2. Out of 350 respondents, 218 were males and 132 were females.
3. Nearly 31% respondents were found to be from below poverty line (BPL) and 69% respondents were above poverty line (APL). The average annual income of all the 350 beneficiaries during Pre Project Period was reported to be Rs 46,399.15

B. Incidence of Benefits from TMH

Incidence of benefits from TMH were assessed in terms of (i) Training and demonstration for capacity building, (ii) Scheme assistances, (iii) Utilization of scheme assistances and (iv) Benefits emerging out of scheme assistance utilization. Assessment of incidence of benefits under above mentioned headings are discussed below.

1. Training and demonstration for capacity building

i. Trainings: Under the technology mission ten (10) kinds of trainings were provided to the beneficiaries. These trainings included (1) Improvement of production technologies, (2) Improvement of crop protection technologies (IPM), (3) Training on bee-keeping, (4) Training on mushroom cultivation, (5) Training on any particular crop like: fruits, vegetables, flowers, aromatic plants, medicinal, spices, plantation crops (cashew nut) etc., (6) Organic farming technologies, (7) Use of agriculture implements, (8) Training on processing or value addition, (9) Nursery Raising, (10) Training on women self help groups. Several respondents attended more than one training programmes. For this reasons 350 respondents total attendance in all 10 programmes became 531.

ii.Demonstrations: Similarly five types of field demonstrations were attended by the respondents. These are demonstration on (i) use of vermin compost, (ii) new improved crop technology, (iii) poly house/green house & low cost tunnel technology, (iv) Integrated pest management technology and (v) certification on organic farming produce. Altogether 203 respondents attended the demonstration programmes.

2. Types of assistances

The assistance provided to the beneficiaries are both in the nature of cash and kind, apart from these, regular monitoring and on farm trials, demonstrations and training have added much for the success of the TM in this region.

i. Assistance in cash: Cash .assistances were given for most of 74 programme components of TMH. Cash assistances varied from ₹ 600/unit (Bee keeping) to ₹ 9 lakhs/unit (for Big nursery in public sector). Altogether 350 respondents received 403 number cash assistances. Several respondents received cash assistances for more than one scheme.

ii. Assistance in kind: Altogether 365 number of scheme assistances were given in kinds to 350 respondents. Like cash assistance, number of respondents received scheme assistance in kind for more than one scheme.

3. Types of utilization

Scheme assistances were utilized for production enhancement of mainly horticulture produces. Utilization of scheme assistances are measured in terms of (a) Area or unit expansion under TMH per respondent, (b) Annual production under TMH scheme per respondents and (c) Number of employment days generated under TMH schemes per respondent.

i. Area or unit expansion: On an average, area under TMH schemes per respondent compared to pre project (TMH) period has increased by 393.28% for Spices, medicinal and aromatic plants followed by 313.65% for Vegetables, 178.96% for Floriculture, 161.92% for Fruits, 61.09% for Plantation crops, and 52.76% for organic farming. For Bee Keeping average production unit under TMH compared to pre project period has increased by 578%.

ii. Production: On an average total production under TMH schemes per respondent compare to pre project (TMH) period has increased by 215% for Fruits followed by 178.66% for Floriculture, 157% for Spices & Medicinal plants, 106.33% for Vegetables, and 52.61% for organic farming. For Bee Keeping average honey production under TMH compared to pre project period has increased by 578.44%.

iii. Employment days: On an average total employment days generated under TMH schemes per respondent compare to pre project (TMH) period has increased by 578% for Bee Keeping followed by 393% for Spices & Medicinal plants etc., 314% for Vegetables, 179% for Floriculture, 162% for Fruits, 100% each for Nursery raising, Power tiller and Diesel Engine, 61% for plantation crops and 53% for Organic Farming.

C. Accrued Benefits of the Respondents

i. Economic benefits: The average annual income of all the 350 beneficiaries during Pre Project Period was reported to be Rs 46,399.15. Out of 350 beneficiaries, only 229 beneficiaries were benefitted by the production output emerged out of the scheme utilization. The average Post Project income of these 229 beneficiaries were found to be Rs 60,578.17.This showed a growth of 30.56% in the annual income of the beneficiaries during Post project over Pre project income .

ii. Other benefits: Besides income enhancements respondents also benefited by (i) Collective marketing facilities through co-operatives/ farmer's groups/ SHGs (12.32% respondents), (ii) Transportation facilities (34.78%), (iii) Linkages with processing units (4.35%), (iv,) Women's Development Interventions (16.67%), (v) Access to Laboratories and IPM facilities (10.14%), and other benefits (24.74%).

Photo 4.1 Photos of TMH Project in Seven Districts of Meghalaya

Bird of Paradise imported from Holland at Centre of Excellence, Williamnagar, East Garo Hills

Gerbera plantation by Women SHGs In Samanda Block, East Garo Hill

Carnation at Centre of Excellence, Williamnagar, East Garo

Anthurium at Centre of Excellence, Williamnagar, East Garo

Organic Farming construction of vermi compost units, in Baghmara, South Garo Hills.

Packing of Strawberry by WSHG in Samanda Block, East Garo Hills.

Bee Keeping in Rongram Block, West Garo Hills.

Production of Colored Capsicum by WSHG in Rongram Block, West Garo Hills

Anthurium cultivation at Centre of Excellence, Samgong in East Garo Hill

Raising Orchid along with Anthurium
Centre of Excellence, Samgong in East Garo Hill

Rose cultivation at Centre of Excellence, at Dewlieh Farm, Umsning, District – Ri-Bhoi

Strawberry cultivation at Centre of Excellence, at Dewlieh Farm, Umsning, District – Ri-Bhoi

CHAPTER V

Impact of Programmatic Components, Constraints and Recommendations

5.1 Introduction

There were 74 programmatic components under 17 types of schemes implemented under TMH. In this chapter, salient impact of various programmatic components and the constraints of implementation have been briefly discussed. Field cases have also been compiled to highlight the field realities. This chapter mainly focuses on scheme wise programme components and the value of assistances provided under each component, constraints of programme implementation and how to overcome them.

5.2 Scheme wise programmatic components

The schemes under area expansion covered Fruits, Floriculture, Plantation crops, vegetables, spices, medicinal and aromatic plants as sub schemes. A wide range of tropical, sub-tropical and temperate fruits (banana, orange, rejuvenation of old orange orchards, pineapple, stone fruits, passion fruits, kiwi, strawberry etc.), flowers (anthurium, carnation, rose, lilium), vegetables (cabbage, cauliflower, carrot, colored capsicum, French beans), spices (turmeric, black-pepper, ginger, chillies, large cardamoms), plantation crops (cashew nut, areca-nut, coconut) both indigenous and exotic were covered in all the districts of Meghalaya apart from other schemes covering use of plastic-culture, On farm water management, Production of planting materials, Transfer of technology and distribution of agriculture equipments.

5.2.1 Analysis of programmatic components

The components as implemented in different district show impressive achievements. The rate of assistance provided for promotion of horticulture crops i.e. for fruits, flower, root & tubers, vegetables, plantation crops, spices and medicinal crops was ₹ 13000/- per hectare with the exception of Kiwi (@₹ 11,250/-ha), Strawberry (@₹ 7,500/-ha), Aromatic plants (@₹ 5,000/-ha) besides providing assistance for creation of infrastructural facilities for improving adaptability and productivity of the crops. The difference observed in the rate of assistance varied from ₹ 600/- under Bee keeping component (lowest) and ₹ 8 lakhs (highest) for establishing nursery for production of planting material. For the detailed rate of assistance and units size refer to Table No. 5.1.

The implementations of all the 74 components under each of 17 schemes were implemented in all 7 district of Meghalaya, differing in the number of units allocated in the district. A detailed review of components under the schemes and the status as implemented in different districts are provided in Table 5.2.

Table 5.1 Assistance given under different programme components of TMH

S. No.	Schemes	Components	Description	
A.	**Fruits**		**Rate in Rs./Ha**	**Unit Size**
1.		Banana	Rs.13,000/ha	(1 unit = 1 ha)
2.		Orange	₹ 13,000/ha	(1 unit = 1 ha)
3.		Pine Apple	₹ 13,000/ha	(1 unit = 1 ha)
4.		Other Fruits	₹ 13,000/ha	(1 unit = 1 ha)
5.		Cherry	₹ 13,000/ha	(1 unit = 1 ha)
6.		Pear	₹ 13,000/ha	(1 unit = 1 ha)
7.		Peach	₹ 13,000/ha	(1 unit = 1 ha)
8.		Indigenous Fruit	₹ 13,000/ha	(1 unit = 1 ha)
9.		Stone Fruit	₹ 13,000/ha	(1 unit = 1 ha)
10.		Passion Fruit	₹ 13,000/ha	(1 unit = 1 ha)
11.		Kiwi	₹ 11,250/ha	(1 unit = 1 ha)
12.		Strawberry	₹ 7,500/ha	(1 unit = 1 ha)
B.	**Floriculture**			
1.		Flowers	₹ 13,000/ha	(1 unit = 0.2 ha)
2.		Rose	₹ 13,000/ha	(1 unit = 0.2 ha)
3.		Carnation	₹ 13,000/ha	(1 unit = 0.2 ha)
4.		Anthurium	₹ 13,000/ha	(1 unit = 0.2 ha)
5.		Lilium	₹ 13,000/ha	(1 unit = 0.2 ha)
C.	**Plantation crops**			
1.		Cashew-nut	₹ 13,000/ha	(1 unit = 1 ha)
2.		Coconut	₹ 13,000/ha	(1 unit = 1 ha)
3.		Areca-nut	₹ 13,000/ha	(1 unit = 1 ha)
D.	**Vegetables**			
1.		Vegetables	₹ 13,000/ha	(1 unit = 1 ha)
2.		Colored Capsicum	₹ 13,000/ha	(1 unit = 1 ha)
E.	**Spices, Medicinal & Aromatic crops**			
1.		Spices	₹ 13,000/ha	(1 unit = 1 ha)
2.		Large Cardamom	₹ 13,000/ha	(1 unit = 1 ha)
3.		Black pepper	₹ 13,000/ha	(1 unit = 1 ha)
4.		Tezpatta	₹ 13,000/ha	(1 unit = 1 ha)
5.		Turmeric	₹ 13,000/ha	(1 unit = 1 ha)
6.		Chilli	₹ 13,000/ha	(1 unit = 1 ha)
7.		Ginger	₹ 13,000/ha	(1 unit = 1 ha)
8.		Betel vine	₹ 13,000/ha	(1 unit = 1 ha)
9.		Medicinal	₹ 13,000/ha	(1 unit = 1 ha)
10.		Aromatic plants	₹ 5,000/-ha.	(1 unit = 1 ha)
F.	**On farm management**			
1.		Bird Protection Net	₹ 2000/- unit	(1 unit = 1 no.)
2.		Anti Hail Net	₹ 500/-tree	(1 unit = 1 Tree)

3.		Shade net	₹ 14/- sq. mt.	
G.	**Creation of water sources**			
1.		Community Tank	₹ 1.00/unit	(one unit)
2.		Tube wells	₹ 12,500/unit	(one unit)
H.	**On farm water management**			
1.		Drip Irrigation	₹ 28,500/units	(one unit)
2.		Mulching	₹ 7000/ unit	(one unit)
3.		Sprinkler Irrigation	₹ 15,000/ unit	(one unit)
4.		Green House	₹ 40,000/- unit	(one unit)
5.		Hi-Tech Green House	₹ 3,25,000/unit	(1 unit = 0.1ha.)
6.		Low Cost Green House	₹ 12,500/ unit	(one unit)
7.		Low Cost Tunnel	₹ 10,000/- unit	(one unit)
8.		Over head water tank	₹ 25,000/- tank	(one unit)
I.	**Production of planting materials**			
1.		Private Nursery for production of planting materials	₹ 3.00/unit	(one unit)
2.		Big Nursery (Public)	₹ 9.00/ unit (in lakh)	(one unit)
3.		Big Nursery (Private)	₹ 8.00/ unit (in lakh)	(one unit)
4.		Small Nursery (Public)	₹ 6.00/ unit (in lakh)	(one unit)
5.		Small Nursery (Private)	₹ 3.00/unit (in lakh)	(one unit)
J.	**Transfer of technology**			(1 unit = 1 ha)
1.		Training Inside the State	₹ 1500/farmers	(1unit=1Farmer)
2.		Training Outside the State	₹ 2500/farmers	(1unit=1Farmer)
K.	**Organic farming**			
1.		Vermi Compost	₹ 30,000/ unit	(Individual unit)
2.		Incentive to Organic Farming	₹ 10,000/unit	(1 unit = 1 ha)
3.		Organic farming on tea		(1 unit = 1 ha)
L.	**Agriculture equipments**			
1.		Manual Operated	₹ 1500/- unit	(One unit)
2.		Power Tiller	₹ 45,000/- unit	(One unit)
3.		Diesel Engine	₹ 9000/ unit	(One unit)
4.		Power Operated	₹ 5000/ unit	(One unit)
5.		Electric Pump set	₹ 3000/ unit	(One unit)
M.	**Farm handling units**		₹ 50,000/ unit	(1 unit = 1 Structure)
N.	**Areca nut soakage tank**		₹ 29,000/tank	(1 unit = 1 Structure)
O.	**IPM**		₹ 1000/ unit	(One unit)
P.	**Plant Protection equipment**			(One unit)
Q.	**Women Self Help Groups**		₹ 5000/- per SHG	(1 unit = 1 SHG)

Table 5.2 District wise implementation status

Sl. No.	Schemes	Components	East Khasi Hills	West Khasi Hills	Jaintia Hills	Ri-Bhoi	East Garo Hills	West Garo Hills	South Garo Hills
A.	**Fruits**								
1.		Banana	Y	Y	Y	Y	Y	Y	Y
2.		Orange	Y	Y	Y	Y	Y	Y	Y
3.		Rejuvenation (old orange orchards)	Y	Y	Y	N	Y	N	N
4.		Pine Apple	Y	Y	Y	Y	Y	Y	Y
5.		Other Fruits	Y	Y	Y	Y	Y	N	N
6.		Cherry	N	N	Y	N	N	N	N
7.		Pear	Y	Y	Y	N	N	N	N
8.		Peach	Y	Y	Y	Y	N	Y	N
9.		Regional Fruit	Y	N	Y	Y	N	N	N
10.		Indigenous Fruit	Y	Y	Y	Y	Y	Y	Y
11.		Stone Fruit	Y	Y	Y	Y	Y	Y	Y
12.		Passion Fruit	Y	Y	Y	Y	Y	Y	Y
13.		Kiwi	Y	N	N	N	N	N	N
14.		Strawberry	Y	Y	Y	Y	Y	Y	N
15.		Root & Tuber	Y	Y	Y	Y	Y	Y	Y
B.	**Floriculture**								
1.		Flowers	Y	Y	Y	Y	N	Y	N
2.		Rose	Y	Y	Y	Y	N	N	N
3.		Carnation	Y	Y	Y	Y	Y	Y	N
4.		Anthurium	N	N	N	Y	Y	Y	Y
5.		Orchids	N	N	N	N	N	Y	N
6.		Lilium	Y	Y	Y	Y	N	Y	N
7.		Gerbera	Y	Y	N	Y	Y	Y	N
C.	**Plantation Crops**								
1.		Cashew-nut	Y	Y	Y	Y	Y	Y	Y
2.		Coconut	N	Y	Y	Y	Y	Y	Y
3.		Areca-nut	Y	Y	Y	Y	Y	Y	Y
D.	**Vegetables**								
1.		Vegetables	Y	Y	Y	Y	Y	Y	Y
2.		Colored Capsicum	Y	Y	Y	Y	Y	Y	Y
E.	**Spices, Medicinal & Aromatic crops**								
1.		Spices	Y	N	Y	Y	Y	Y	Y
2.		Large Cardamom	N	N	Y	N	N	Y	N
3.		Black pepper	Y	Y	Y	Y	Y	Y	Y
4.		Tezpatta	N	Y	Y	N	N	Y	N
5.		Turmeric	Y	Y	Y	Y	Y	Y	Y
6.		Chilli	Y	Y	Y	Y	Y	Y	Y

7.		Ginger	N	Y	Y	Y	Y	Y	Y
8.		Betel vine	Y	Y	Y	Y	Y	Y	Y
9.		Medicinal	Y	Y	Y	Y	Y	Y	Y
10.		Aromatic plants	N	Y	Y	Y	Y	Y	N
11.		Vanilla	N	N	N	N	N	N	N
F.	**Use of Plastic-culture**								
1.		Soil Conservation	Y	N	N	N	N	N	N
2.		Bird Protection Net	Y	N	N	Y	N	N	N
3.		Anti Hail Net	Y	N	N	Y	N	N	N
4.		Shade net	Y	N	N	Y	Y	Y	Y
G.	**Creation of water sources**								
1.		Community Tank	Y	Y	Y	Y	Y	Y	Y
2.		Tube wells	Y	Y	Y	Y	Y	Y	Y
H.	**On farm water management**								
1.		Drip Irrigation	Y	Y	Y	Y	Y	Y	Y
2.		Mulching	Y	Y	Y	Y	Y	Y	Y
3.		Sprinkler Irrigation	Y	Y	Y	Y	Y	Y	Y
4.		Green House	Y	Y	Y	Y	Y	Y	Y
5.		Hi-Tech Green House	Y	Y	Y	Y	Y	Y	Y
6.		Low Cost Green House	Y	Y	Y	Y	Y	Y	Y
7.		Low Cost Tunnel	Y	Y	Y	Y	Y	Y	N
8.		Over head water tank	Y	N	N	Y	N	N	N
I.	**Production of planting materials**								
1.		Private Nursery for production of planting materials	Y	N	Y	Y	N	N	N
2.		Big Nursery (Public)	Y	Y	Y	Y	Y	Y	N
3.		Big Nursery (Private)	N	N	Y	Y	Y	Y	Y
4.		Small Nursery (Public)	Y	Y	Y	Y	Y	Y	Y
5.		Small Nursery (Private)	Y	Y	Y	Y	Y	Y	Y
J.	**Transfer of technology**								
1.		Training Inside the State	Y	Y	Y	Y	Y	Y	Y
2.		Training Outside the State	Y	Y	Y	Y	Y	Y	Y
K.	**Organic farming**								
1.		Vermi Compost	Y	Y	Y	Y	Y	Y	Y
2.		Incentive to Organic Farming	Y	Y	Y	Y	Y	N	Y
3.		Organic farming on tea	N	N	N	N	N	N	N
L.	**Agriculture equipments**								
1.		Manual Operated	Y	Y	Y	Y	Y	Y	Y
2.		Power Tiller	Y	Y	Y	Y	Y	Y	Y
3.		Diesel Engine	Y	Y	Y	Y	Y	Y	Y

4.		Power Operated	Y	Y	Y	Y	N	N	Y
5.		Electric Pump set	Y	Y	Y	Y	Y	Y	Y
M.	**Bee keeping**								
1.		Bee Keeping (2007-08)	Y	Y	Y	Y	Y	Y	Y
N.	**Farm handling units**								
1.		Farm Handing units	Y	Y	Y	Y	Y	Y	Y
2.		Areca nut Soakage Tank	Y	N	Y	Y	N	Y	Y
3.		IPM	Y	Y	Y	Y	Y	Y	Y
4.		Plant Protection equipment	N	N	N	N	N	N	Y
5.		Women Self Help Groups	Y	Y	Y	Y	Y	Y	Y
6.		Construction of poly houses	N	N	N	N	N	Y	N
7.		Center of Excellence	N	N	N	Y	Y	N	N

(Y = Yes, N = No)

Table 5.3 Average economic benefit from the schemes

Schemes	Respon Dents	Average annual income (Rs.)		
		Pre Project	Post Project	% Increase
Fruits	54	50111.11	75166.25	49.99
Floriculture	38	57228.95	75940.26	32.70
Plantation Crops	27	57592.59	66278.01	15.08
Vegetables	53	55471.70	65396.60	17.89
Spices, Medicinal & Aromatic Plants	23	51086.96	56239.49	10.09
Use of Plastic-Culture	17	42647.06	0	12.31
Creation of Water Resources	6	50000.00	0	14.27
On Farm Water Management	26	53442.31	0	22.25
Production of Planting materials	8	30000.00	35921.63	19.74
Transfer of technology	43	39546.51	0	13.27
Organic Farming	19	54052.63	65993.19	22.09
Agriculture Equipments	10	31100.00	0	20.98
Bee Keeping	7	37571.43	43689.95	16.29
Farm handling units	19	39736.84	0	19.22
Total	**350**	**46399.15**	**60578.17**	**30.56**

5.2.2 Economic benefits:

The average annual income of all the 350 beneficiaries during Pre Project Period was reported to be Rs 46,399.15. Out of 350 beneficiaries, only 229 beneficiaries were benefitted by the production output emerged out of the scheme utilization. The average Post Project income of these 229 beneficiaries were found to be Rs 60,578.17.This showed a growth of 30.56% in the annual income of the beneficiaries during Post project over Pre project income (Table 5.3).

5.2.3 District wise best practices

The Technology Mission provided extension support for adopting improved technology and use of quality inputs including quality planting material. The intervention brought under horticulture production was a direct impact on the realized high productivity levels.

a. Establishment of Horti-hubs also known as Centre of Excellence at William Nagar in East Garo Hills and at Dewlieh Farm, Umsning in Ri-Bhoi districts have made a significant impact for the farmers around these districts. Demonstration on cultivation of particular crop like Strawberry, Colored capsicum, packaging, processing and storage of fruits & vegetables etc., farm trials on some temperate exotic fruits and flowers are the highlights of these hubs. The Centre of Excellence is also serving as the training center for the farming community. Various types of irrigation systems, poly houses, net houses and mist chambers are being used to grow exotic varieties of flowers, fruits and vegetables under controlled conditions.

b. Fruit cultivation area was largely witnessed in the West Garo district (2642ha.) followed by Ri- Bhoi district (1847 ha.) and East Garo(1774 ha).

c. Another scheme by which the majority of respondents were benefited was area expansion under vegetable cultivation. The maximum area covered under this scheme was reported in East Khasi Hills district (1001 ha, unit shows the total cropped area under vegetables), followed by East Garo Hills district (983 ha), West Garo Hills (670 ha), West Khasi Hills (577 ha), Ri-Bhoi (548 ha), Jaintia (518 ha) and South Garo Hills (388 ha).

d. Cultivation of spices was also largely witnessed with a total production of 3454 ha in Meghalaya. Jaintia Hills District witnessed the highest production (760 ha) followed by EastGaro, West Garo and Ri-Bhoi.

e. Floriculture cultivation was highest in Ri-Bhoi followed by East Garo and Jaintia. Meghalya accounted for a total of 4923 ha of Floriculture cultivation.

5.2.4 Program components which cause greater benefits

The focus of the TMH was in the area expansion under different horticultural crops, particularly promoting temperate region fruits (including strawberry), flowers, vegetables (colored capsicum) and plantation crops etc. as evident from the survey and evaluation of various program components. The greater impact under area expansion was observed in the total area under fruits cultivation.

Altogether 10220.5 ha of land were covered under various Fruits programme components during 2001-2008 in Meghalaya. Out of these, East Khasi Hill district had 1273 ha coverage, West Khasi Hill district had 914 ha coverage, Jaintia Hill district had 944.5 ha coverage, Ri-Bhoi district had 1847 ha coverage, East Garo Hill district had 1774 ha coverage, West Garo Hill district had 2642 ha coverage, and South Garo Hill district had 826 ha coverage

5.3 Crop Wise Targets and Achievement

Table 5.4 Crop Wise Targets and Achievement for Xth and XIth Plan

Sl. No	Item	Units ´000MT	Xth Plan		XI Plan	
			Target (2002-07)	Achievement (2002-07)	Target (2007-12)	Achievement (2007-08)
1	**Fruit Crops**					
	Pineapple	´000MT	85.00	85.00	90.40	90.04
	Citrus Fruits	´000MT	34.33	34.33	46.28	42.81
	Banana	´000MT	66.41	66.41	82.08	83.25
	Papaya	´000MT	6.10	6.10	10.09	10.31

	Temperate Fruits	´000MT	5.33	5.33	7.05	10.42
	Misc Fruits	´000MT	36.76	36.76	50.04	45.92
	Strawberry	´000MT	-	-	6.04	5.89
	Total Fruits	**´000MT**	**234.33**	**234.33**	**291.98**	**288.64**
2	**Vegetables**	**´000MT**	**145.49**	**145.49**	**170.02**	**152.64**
3	**Tuber Crops**					
	Potato	´000MT	157.58	157.58	192.19	172.01
	Sweet Potato	´000MT	19.02	19.02	25.35	25.04
	Tapioca	´000MT	23.32	23.32	29.15	28.05
	Total Tuber Crops	**´000MT**	**199.92**	**199.92**	**246.69**	**225.10**
4	**Spice Crops**					
	Ginger	´000MT	46.81	46.81	60.54	50.24
	Turmeric	´000MT	9.62	9.62	15.05	12.75
	Chillies	´000MT	1.26	1.26	18.07	3.14
	Black Pepper	´000MT	0.54	0.54	2.12	2.18
	Total Spice Crops	**´000MT**	**58.23**	**58.23**	**95.78**	**68.31**
5	**Plantation Crops**					
	Tea	´000MT	1.84	1.84	5.60	5.70
	Arecanut	´000MT	14.77	14.77	18.24	19.05
	Cashewnut	´000MT	6.40	6.40	8.45	9.08
	Total Plantation Crops	**´000MT**	**23.01**	**23.01**	**32.29**	**33.83**

5.4 Constraints of programme implementation

The main objective of the Mission was a holistic development of the horticulture sector covering fruits, vegetables, spices, flowers, aromatic plants and plantation crops. In the process of analyzing the effectiveness of the Technology mission an attempt has been made to identify the major constraints, which hamper the productivity of the crops and limit the types of assistance and critical inputs that the farmers ought to get.

It is clear from the review of implementation of the TMH that there has been a substantial increase in area, production and productivity in major Horticulture crops leading to employment generation, since last plan periods. However, the gaps in the Horticulture development, in the state, have also been identified.

The constraints can still be worked upon, as there is still scope for improvement.

The following constraints have been identified during the study:

1. Time required

The TMH was launched in 2001-02 to address the issues of production, marketing and processing of Horticulture crops through MgSFAC, the implementing organization which has been mandated by the Dept. of Agriculture, Govt. of India to implement the mission programme. SFAC has contributed a lot in endorsing Horticulture crops in the state of Meghalaya. Still there is a need to go a long way in promoting the horticultural industry at a competitive edge. MgSFAC activities will definitely get organized gradually over the years. Only after this state level arrangement has functioned for a few years would it be possible for the state to decide what

kind of a formal organization set up it would like to have at the district level to promote SFAC. It would, therefore be prudent to give some time for this state level arrangement to reaffirm itself in the promotion of Horticulture crops.

2. Maintenance of records

The Records were found to be maintained in a few offices but it still needs to be kept in a more systematic manner. Though it was reported that the records of the various DDOs were audited by Chartered Accountants as well as by the Accountant General from time to time, but in a few cases the records were found missing. Maintenance of records is equally important as documenting them. Vital records such as category wise posts sanctioned by the Government, production of nursery seedlings, income derived from the sale of seedlings and fruits, total quantity of chemical fertilizer and pesticides received from the competent authority etc also needs to be regularly maintained.

This study was conducted to assess the progress of the mission. However, records on earlier years were not maintained by some of the implementing agency. In the absence of such important records it was a herculean task for the evaluation team to make any systematic assessment of the progress of the Mission. Hence the team faced difficulty in working out accurate year-wise achievement. As such, the cumulative achievement right from its inception i.e. 2001- 2008 could not be assessed properly. Cash books, Stock books and distribution list were maintained by some implementing agencies only. Records on financial involvement such as land compensation, purchase of vehicles, purchase of tools and equipment, construction of various infrastructures etc. were not at all available to the Evaluation team. Thus proper analysis on financial target and achievement could not be attempted in this report. The department should in future ensure that proper records are maintained in all the activities of the mission.

3. Database & Market Intelligence

The MgSFAC is dependent on the data base generated by the Department of Agriculture, Govt. of Meghalaya. If MgSFAC initiates its own data base and market intelligence, it would give the programmes and project a boost. This should be given importance and should also be understood that an authentic and upto date statistical base is an essential pre-requisite for proper planning process for development of the Horticulture sector. Efforts should be made in making attempts to compile the data on area, production and productivity of some of the horticultural crops on a regular basis. More realistic planning would have been possible if actual data for all the years since the initiation of the TMH were made available. In the absence of this statistical information uniformly for all the years, the evaluation team had to face limitations to make realistic assessment of the actual needs of this sector. Unless the data base is made stronger and broader in its coverage, long-term planning for horticultural development will be difficult and unrealistic. Furthermore, bench mark survey of all horticultural crops need to be conducted. The Mission should set up a market intelligence unit to provide market/ trade information to disseminate information related to the sector. There is an urgent need to develop and strengthen Horticulture database system for generation, documentation and dissemination of the information.

4. Training and exposure

As reported by the beneficiaries so far few trainings have been imparted in the Districts by the concerned Departments. Though time to time, training and exposure trips were conducted for the officers and farmers by taking them to HTC Pune and HTC Jaipur. The Evaluation team strongly

felt that technical training/guidance should be given to the farmers time to time for proper knowledge and capacity building of the farmers involved in the programme. The amount of training needs to be substantially increased, such that all stakeholders having responsibility for horticultural crops should receive training each year.

5. Fencing of farm

The fencing should be emphasized more vigorously. Several respondents were found to be casual about the fencing and therefore faced the threat of damage due to cattle or other animals.

6. Marketing of the product

It was reported that, the farm could produce about 10,000 kgs. of different fruits in a year. Fruits being perishable item, unless they are sold at the right time, the fruits will perish within no time. But due to the non availability of market facilities and cold storage equipment for preservation of the fruits, most of the fruits were sold out in the local market at a throw away price and most of the unsold fruits either perished, eaten up by animals or stolen by the people. The concerned department should find ways and means for the disposal of all the products of the farm at the right time so that the production of the farm is fully utilized without wastage and also for earning more revenue to the State Government.

7. Inadequate processing infrastructure

A large quantity of different fruits, vegetables, cereals, and pulses are grown in the State but most of them are either consumed directly or exported to other regions. Due to inadequate processing infrastructure very less quantity of the total production is processed. If the processing facilities are improved, it would help in increase in farm income as well as employment in rural areas. The Mission should initiate steps for encouraging investment in food processing sector by rationalization of procedures, encouraging entrepreneurs, strengthening of food processing units in the State to focus on quality and brand building exercise.

8. Export potential

The evaluation has brought out the potential for development of Horticulture produce, particularly organically grown Horticulture produce, which can be sold in raw or processed form. Meghalaya is famous for oranges and some other crops such as Passion fruit, Kiwi, strawberry, large cardamom etc. which are grown only in this region of the country. These fruits have considerable export potential which is yet to be exploited. The demand for Floriculture has increased significantly.

Excellent marketing of Anthurium as cut flower has given a phenomenal impact to the farmers at the local level. There is also a huge scope for export of Anthurium to countries like Japan and Middle East. As reported from the districts of Ri Bhoi and Garo Hills, Anthurium was sent to Japan and Dubai, but due to small scale production, it could not be carried forward. Proper planning and developmental efforts can be very flourishing for floriculture business enterprises in Meghalaya.

The North East region has also good scope for horizontal expansion as much unused land suitable for cultivation of different horticultural crops is available.

5.5 General Recommendations and Suggestions

A. Programme implementation

This Evaluation Report has analysed the present status of Horticulture in the hilly terrain and observed gaps and constraints in the implementation of the TMH programme. Based on the achievements, the gaps and lessons learnt during evaluation have rightly been identified. To overcome these gaps, a number of recommendations for action have been formulated by AISD. For proper implementation of the mission programme, it is suggested that the TMH should analyze the critical gaps, consider the recommendations proposed and take into account the interdependence of different challenges and points of entry.

1. Programme Coordination

Given the other recommendations of the TMH, many responsibilities for the Programme Coordination team have been identified. The TMH needs to re-consider how overall coordination and planning of horticultural development will be promoted. They need to decide how to best address these issues, whether through increasing administrative staff in the Programme Coordination team, providing management training for existing staff, and/or obtaining technical assistance. Various programme stakeholders need also to comply with management's procedural guidelines, i.e., regarding planning, budgeting, reporting, monitoring, etc.

2. Strategic Planning

The TMH Programme is broad and fairly ambitious. Nonetheless, development of Horticulture in Meghalaya is a long-term endeavor that will require at least 10-15 years of support. Therefore, more attention is needed for strategic planning, in terms of deciding on priorities for the remainder of the current programme and activities for the coming phases.

Therefore, the Evaluation team recommends that the TMH Programme Management conduct different phases of strategic planning workshop, to refocus the programme design, agree upon priority activities and outputs, and to develop a work plan and budget for the remaining years of the programme. The strategic planning workshop would help work on further development of indicators to monitor the programme's performance (achievement of outputs) and impacts (achievement of objectives).

3. Training and exposure

Horticulture is a technically challenging and complex field. Given the introduction of new techniques and limited exposure of the personnel, efforts must be made to provide additional assistance. To achieve this, technical assistance and training and other support is required for nursery operators. Training programme should be organized for farmers on pre and post harvest management.

Large number of farmers from all the districts of the state should be given exposure of Horticulture Development programmmes outside the state, so as to familiarize them with latest technologies being employed by other developed states. Similarly Farmers' training under the mission is a key programme for ushering in Horticulture development in the region. Hence the farmers should be given ample opportunity to participate in training programs that will enhance their capacity and knowledge towards use of improved techniques in Horticulture.

The Evaluation team recommends that TMH should consider where it can best find such technical guidance that can provide technical training to its farmers. It may be possible for TMH to arrange capacity building programmes through SAMETI/ ATMA within the state. Other alternative is to find some expertise through other projects and programmes to provide some short-term technical guidance. If such technical guidance cannot be found in the team of implementing agency, then technical assistance should be recruited through private consulting firms, or capacity building professional consultants, whichever may be best suited to provide these services. The Mission should discuss whether such arrangement could be supported within the existing budget, or whether additional funds to procure assistance from the Dept. of Agriculture could be available.

4. Infrastructure facilities

The Mission has the potential to register commendable progress on the production front with the provision of more infrastructure creation in terms of nurseries, green houses, community tanks, tube wells and tissue culture labs. Besides enthusiasm of farmers, this will help serve as focal points for extension of recommended technology to a large number of farmers in identified production clusters and also provide forward linkages between production and marketing by setting up facilities for sorting, grading, packaging and making trading arrangements.

5. Monitoring and Evaluation

It is envisaged that the Technology Horticulture Mission will monitor all programmes in the area of Horticulture. It is recommended that adequately staffed and equipped Monitoring and Evaluation (M&E) unit should be set up in the Mission for taking up this responsibility on a systematic basis. The State Level Executive Committees should also be assisted by M&E Units for concurrent monitoring of the on-going programmes.

The programme needs to develop an adequate Monitoring and Evaluation system. This will facilitate the preparation of such internal reports that will act as an important source for evaluating activities time to time. Prior to entrusting any external agency for evaluation, the progress reports and internal evaluation reports need to be prepared and compiled by the programme management unit. Such monitoring and reporting will not only serve evaluation purposes, but also more importantly serve as an ongoing management tool.

There is also need for strengthening of district level implementation and monitoring functions.

It is suggested that in each district a Functional Committee may be set up for this purpose. Fresh graduates in various disciplines of agricultural sciences, agricultural economics etc. could be inducted on ad hoc basis for project implementation and also to obtain a feed back on problems and constraints faced by cultivators/entrepreneurs.

Besides, internal evaluation, arrangements also need to be made at the district level for third party monitoring and periodic evaluation to get un-biased feedback. Out-sourcing of this function to Consultants also needs to be considered.

6. Need for Improved Data Base

There is need for improving data base in the Horticulture sector for better programme administration. In view of staff constraints in the concerned departments at the State level, the TMH needs to hire technical graduates for collection of data on input use, area/production/productivity of Horticulture crops, consumption of Horticulture produce,

estimation of market surpluses etc. These professionals may be located in the departments or outsourced to public institutes. The collection of data needs to be organised on uniform standardized lines across the States. Methodologies and guidelines for this purpose need to be laid down.

7. Corpus Fund

Since the Mission programme extends over a large gamut from production, post-harvest management marketing to processing, the need for funding of studies on different aspects/field problems, market research, R&D efforts and processing technology can arise at any point of time. There are chances where unfavorable climate change and such unforeseen or other contingent expenditure cannot be provided for in normal budgeting procedures. It is suggested that a Corpus Fund might be set up under a separate budget. Source of funding is crucial and it is suggested that a corpus of sufficient amount would be a must so that the recurring income arising out of the corpus could take care of activities of MgSFAC.

8. Incentives for Production

The endeavour of the Mission is to achieve productivity increase in traditional crops and introduce commercially high valued innovative crops which are in demand in international and domestic markets. The emphasis is also on improving quality of the raw produce so that it is open to processing for marketable value added products. The basic support needed is quality planting material for Horticulture crops. It is necessary to work out projections of planting material required for each crop and each variety on the basis of year-wise projections of area under the Strategic Plan. This will help provide extension and financial support to farmers.

9. Organic Farming

Another thrust area for the Mission is to promote organic farming for which the region has natural advantages. The region is known to use minimum fertilizers and pesticides. This weakness is proposed to be converted into strength through appropriate technology-based development and adoption of organic management of Horticulture development activities. Incentives should be given for organic farming for commercial crops such as ginger, pepper, turmeric, cardamom and other spices. Along with provision for production incentives, there is also the need for providing investments for certification and marketing of organic produce.

10. Irrigation Costs

The success of Horticulture takes into account cost of irrigation including provision of micro irrigation facilities. In the North East Region due to nature of terrain and geo-hydrological factors, the source of irrigation is often located at quite a distance from the producing area. In such cases there should be appropriate arrangements for including cost of lifting water and channeling it from the source to the cultivation/ producing area. Additional arrangements should be made for interior and hard to reach areas too.

11. Marketing

It was felt that MgSFAC should take up marketing as one of the major thrust areas. It should collect useful market intelligence and make it available to farmers and their organizations and enterprises. It should also help the farmers in obtaining marketing support from existing Government Schemes.

Improvement of local and export marketing of horticultural produce, medicinal and aromatic plants, and value-added products will require not only improvement of domestic markets, but also greater attention to domestic and export market information. It also needs improving linkages with all ongoing marketing efforts and collaborators. Marketing studies are needed to find viable markets for floriculture and medicinal plants.

The Mission should make adequate provision for market promotion measures through mass, print/electronic media and product awareness campaigns. Provisions also need to be made for collection of market intelligence. For this purpose the TMH should consider creating information hubs at the district level manned by professionals. Collection of information should be undertaken with the support of Information Technology wherever possible.

There is a greater need for efficient linkages between the producers and the consumers for expanding employment opportunities and increasing the rural income through better marketing of agricultural products.

12. Collection Centres

In each of the locations market collection centres needs to be put up with facilities for cleaning, grading and packaging. Collection centres will need to be set up for more organized and quicker transport of fresh produce to the wholesale/secondary market sites. These collection centres also need to be linked directly to small scale processing units which also need to be set up in each cluster of Horticulture grown areas.

13. Role of other organisations

There is also need for involvement of the other agencies in marketing and processing areas. These agencies such as TRIFED, NAFED etc. already have the required mandate to lend/ support to the Mission activities in these two subject areas. Besides this the existing allied agencies like ICAR, NHB, NRCO, NABARD, Cooperatives etc, and several nationally acclaimed organizations need to be involved more actively in the Missions programmes.

14. Research and Development

In view of lack of research support in critically important crops and programmes of Meghalaya, it is necessary for the State to establish Research Institutes for commercially grown Horticulture crops. These research institutes will help carry out basic research in consonance with locally associated problems and development requirements. At the national level, The Indian Council of Agricultural Research (ICAR) has been gradually building up research infrastructure for a wide variety of horticultural crops. The ICAR also provides funding support to several institutes through a large number of time-bound ad-hoc mission mode projects to solve specific problems as well as International collaborations and foreign aided projects to promote Horticulture research in certain specific areas. Systematic research efforts will lead to the development of improved varieties and hybrids, improved production and protection technologies for different horticultural crops for varying agro-climatic regions and situations of the country as well as post harvest processing.

15. Commitment, Ownership and Sustainability

The Horticulture programme is highly relevant for the development of the region involved in the sector, the peripheral areas as well as the state on the whole. This in turn will remain a priority for national development for the years to come. The sector has been accorded high priority in

almost all the Five Year Plans. The Ministry of Agriculture demonstrates a clear sense of "ownership" of this nationally executed programme. The TMH was favorably impressed by the personal commitment of the government staff and the farmers. The sustainability of activities is growing, as more farmers and others in the private sector become engaged in horticultural activities and enterprises. The human resource development efforts to build up staff capacities also are contributing to the long-term sustainability of efforts to develop the horticultural sector. To adequately develop Horticulture over the next 10-20 years in Meghalaya, considerable additional support will be needed, from the State as well as the Central Government, donors and private investors.

B. Financial

Horticulture and Floriculture hold immense potential in terms of high value addition to the farmers. The constraining factors include high cost of cultivation, transportation and marketing. With the financial help of SFAC, the economic status of the farmers will be further strengthened and export promotion will be facilitated. To bear the transportation cost, Transport subsidy should be provided to the beneficiaries.

The high capital cost involved in establishing an orchard/ a plantation, or rejuvenation of existing old unproductive plantation poses serious constraint in area expansion under these crops. The situation becomes all the more difficult in view of the large number of small holdings devoted to these crops which are essentially owned by weaker section, who have no means to invest, nor can afford to stand the burden of credit even if available. Besides this, is the long growth period of the horticultural crops like mango, orange, apple and plantation crops like coconut, arecanut, cashewnut, etc.

All these factors necessitate the provision for easy going credit facilities in easy installments for repayment of loans tosmall and marginal farmers. High cost of inputs and lack of enough incentives for production of quality varieties /species, product diversification, value addition, etc. also hinder crops development.

SFAC should utilize funds as per provision of the scheme and send regular progress report and utilization certificate to the Technology Mission Cell in the prescribed format. SFAC should also get its accounts audited at the end of each financial year, by the authorized Chartered Accountants and state level agency like the Accountant General.

5.6 District wise Recommendations and Suggestions

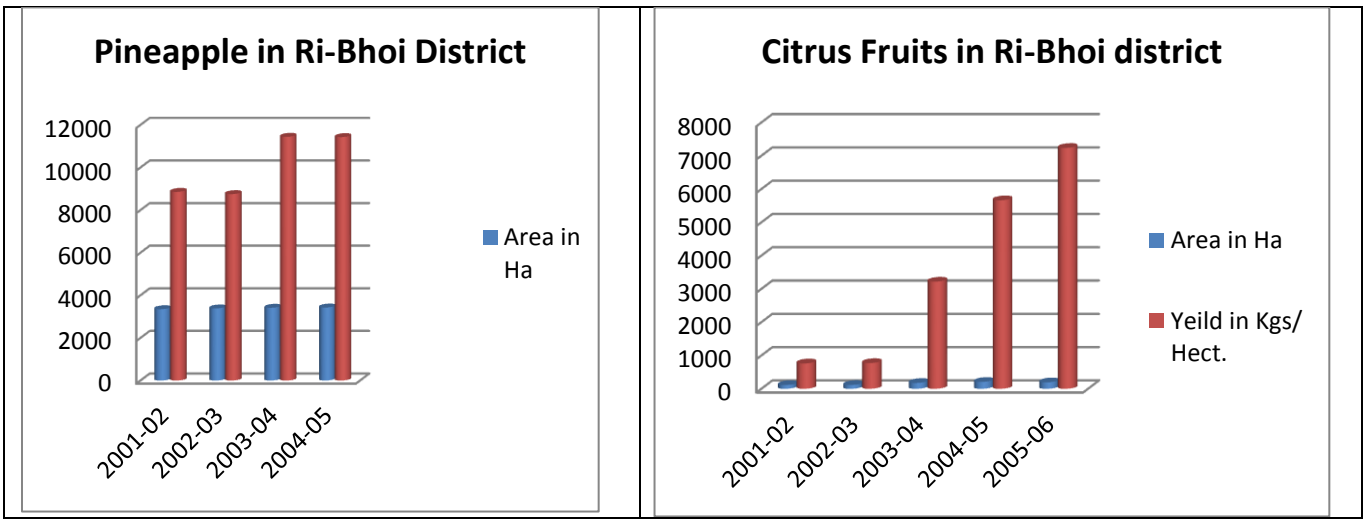
5.6.1 Ri- Bhoi

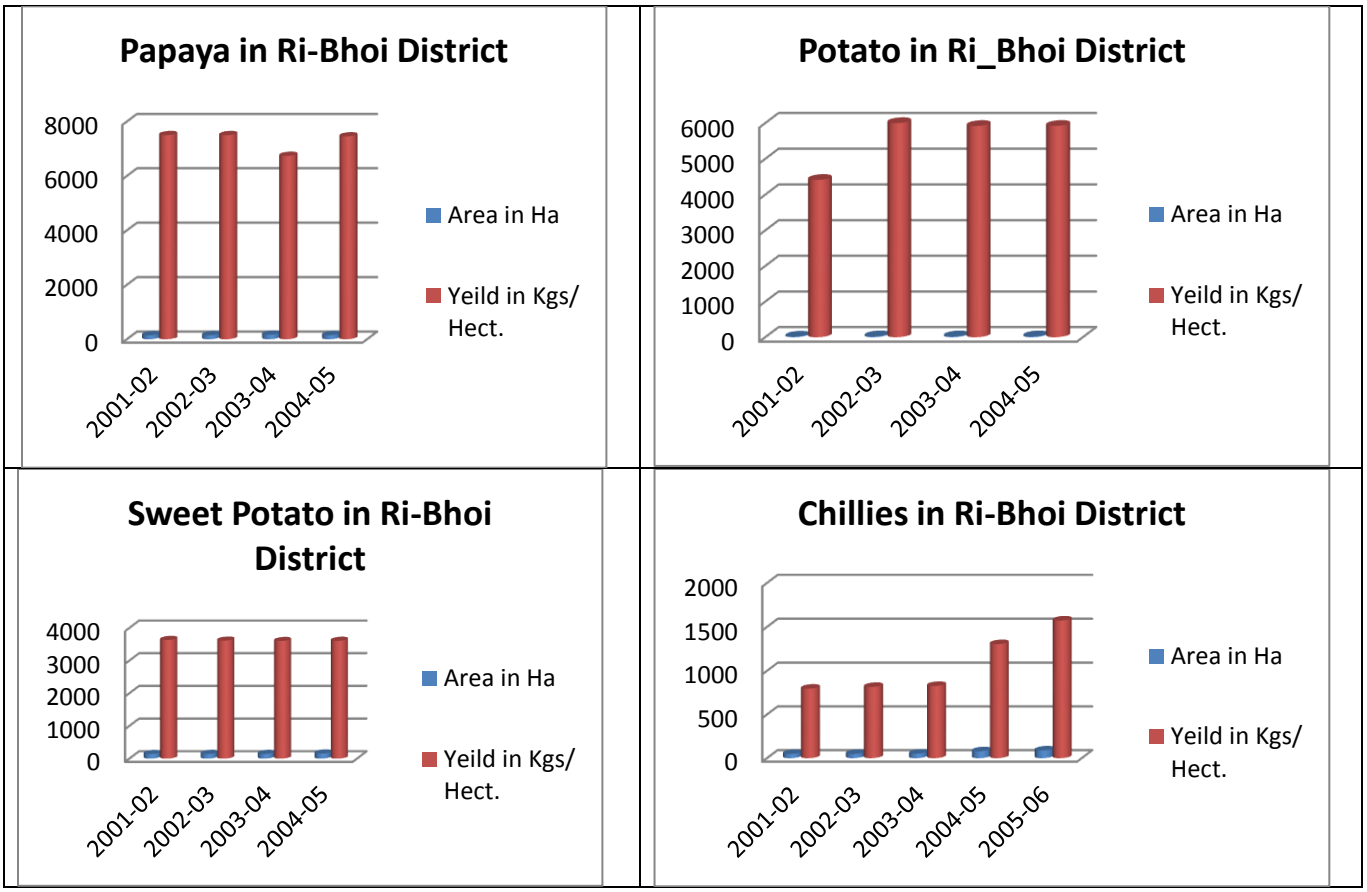
- About 80% of the district falls in sub-tropical zone for horticulture production. As a result subtropical crops such as pineapple, strawberry, ginger, turmeric, sweet potato, arecanut, vegetables and flowers should primarily be targeted for improvement in area coverage as well as productivity.
- The district has second highest area of land under miscellaneous tree crops and groves, management of the groves where horticulture centered institutional development can be promoted through cooperatives or SHGs with five to ten years lease term.
- Considering the locational advantage of the district being closest to Guwahati Airport, it should be developed as a hub of collection centers for horticulture produce for the entire

state. A series of cold storages needs to be set up at strategic locations along the national Highway.

- The model project on strawberry at Dewlieh, Umsning should widely be replicated and publicized as successful model. This can lead to shift towards sustainable mono-cropping of high value cash crops at larger scale through pro-active role of change agents (successful farmers).
- The Umsing- Nongpoh belt should be developed as hub of vegetable production and floriculture through extension of horticulture services in the area on an intensive project mode.
- The district has displayed significant increase in production with respect to cole crop, carrort, radish, tomato and peas, along with increase in productivity of most vegetable crops for the period 2001-02 to 2005-06. This should be further encouraged through crop specific promotional activities and development interventions.
- As the productivity of citrus fruits in the district is nearly double than state average but the area under citrus crops is just two percent of total area of the same in Meghalaya, there is immense scope of area expansion in the district. This can be achieved through focused area approach for citrus fruits.
- There is need for setting up of fruit processing unit in the district to cater to the demand from the external market.
- Similarly as the district leads in productivity of spices like turmeric and chilly but the area coverage is less, there is need for allocation of more funds towards area expansion of these crops. (2007-08)

Fig.5.1 Growth of Area and productivity of major Horticulture crops in Ri- Bhoi District after implementation of TMH

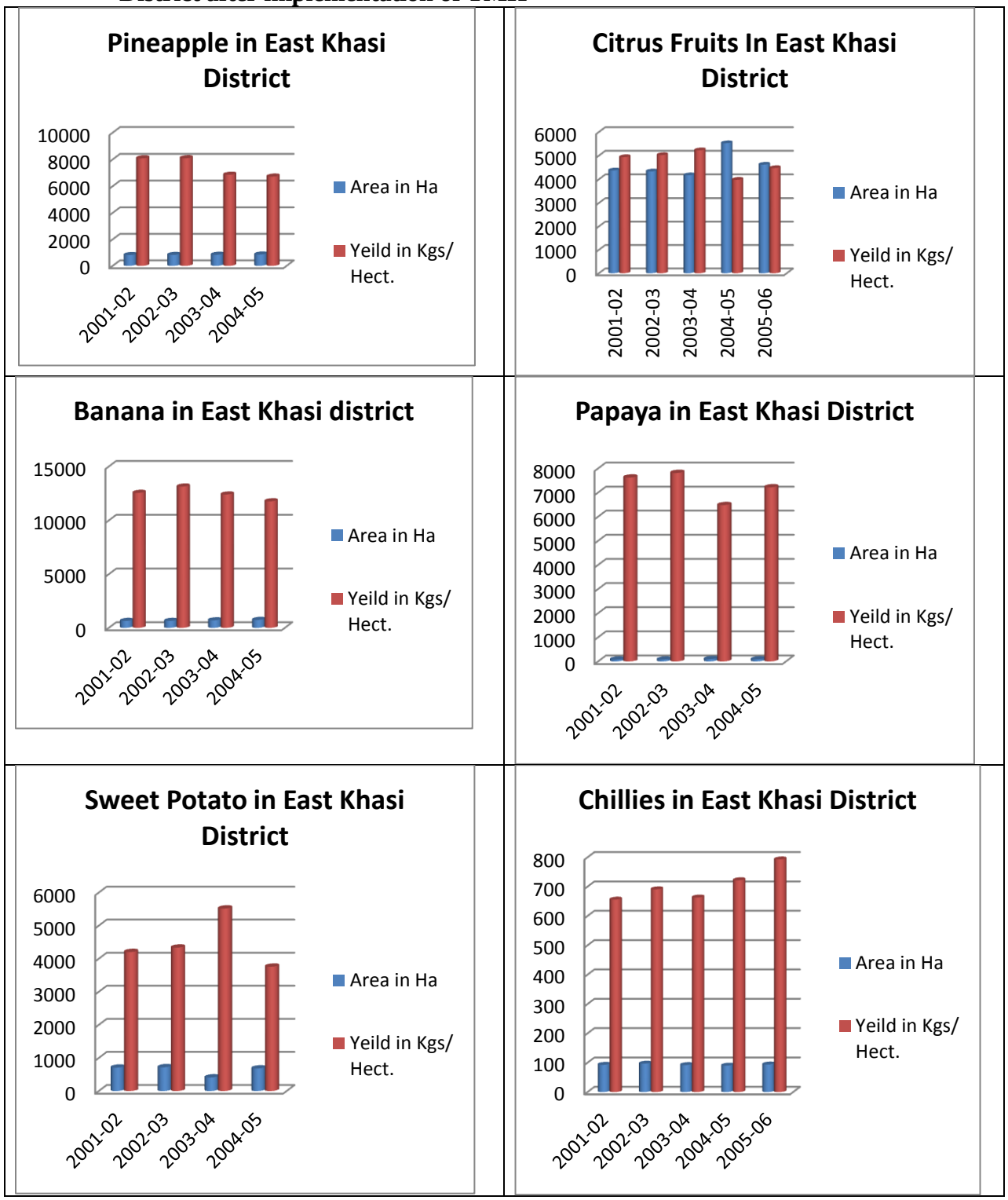




5.6.2 East Khasi Hills

- The district has more than half of the total area of Meghalaya under temperate zone and is home to several traditional horticulture products such as Khasi Mandarins etc. Considering this the target crops should be a balanced mix of traditional as well as exotic temperate crops.
- The locational advantage of the district as the administrative and transportation centre should be utilized for collection and dissemination of technical knowhow as well as physical and financial resources.
- The foray into successful cultivation of off seasonal vegetables like tomatotes in the district should be encouraged by grater allocation of resources such as poly houses.
- The widely acknowledged workmanship of the horticulture farmers of the Shillong plateau especially potato should be encashed towards building up of pioneer horticulture institution on cooperative model of Horticulture.
- During the period 2001-02 to 2004-05 the productivity of pineapple has decreased by 1367 Kgs/ Ha though there has been small increase in area of 40 Ha. This calls for proper ascertaining of causes and designing of remedies for rejuvenation of orchards.

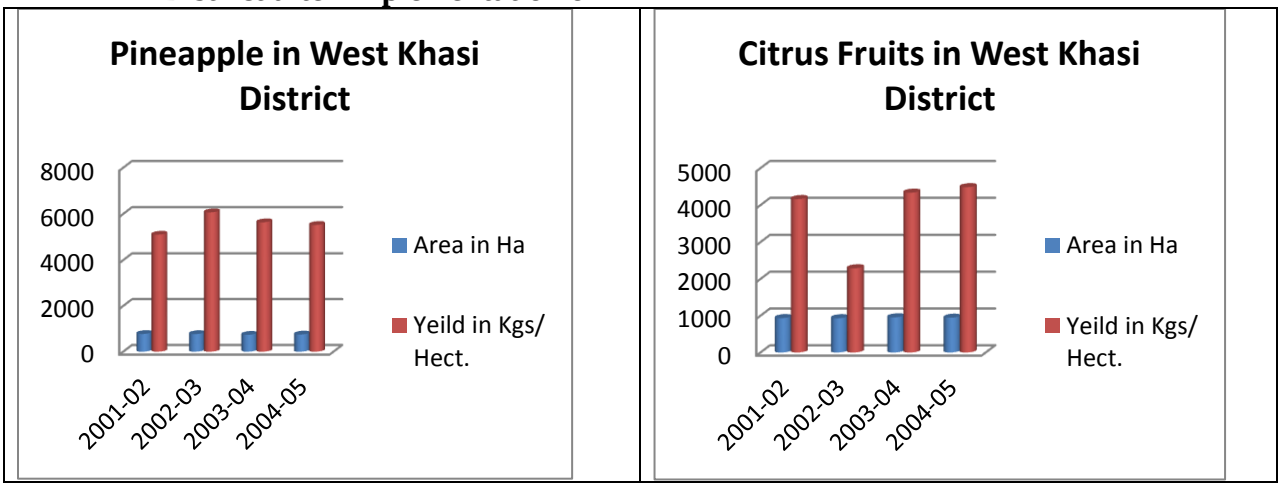
Fig. 5.2 Growth of Area and productivity of major Horticulture crops in East Khasi District after implementation of TMH

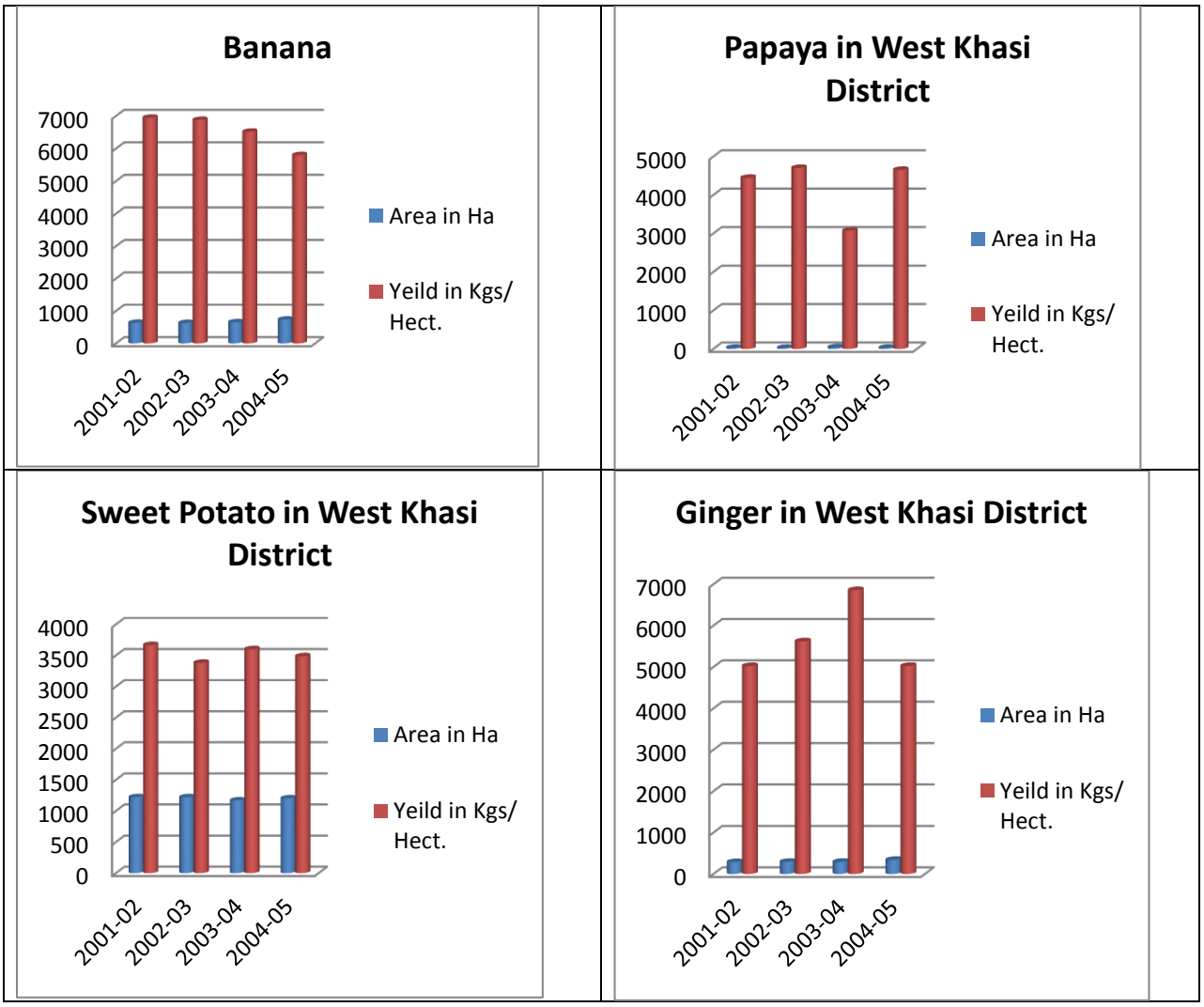


5.6.3 West Khasi Hills

- As the district possesses the best balance of temperate and sub tropical zone for horticulture equal importance should be given for promotion of tropical as well as temperate crops.
- As the district has maximum area in the state under the category of cultivable wasteland and fallow it should be seen as the focus district for area expansion under horticulture crops.
- As the road density of the district is one of the lowest in the state traditional horticulture crops with high shelf life such as pineapple, spices and sweet potato should be targeted in remote areas whereas high value exotic crops can be promoted in high altitude areas close to Shillong.
- As the district has the maximum area in the state under category of forest, pineapple cultivation should be encouraged on a wider scale to overcome the menace of Jhum cultivation.
- There should be higher allocation of funds for promotion of cultivation of fruits, spices, medicinal and aromatic plants in the district.

Fig. 5.3 Growth of Area and productivity of major Horticulture crops in West Khasi District after implementation of TMH





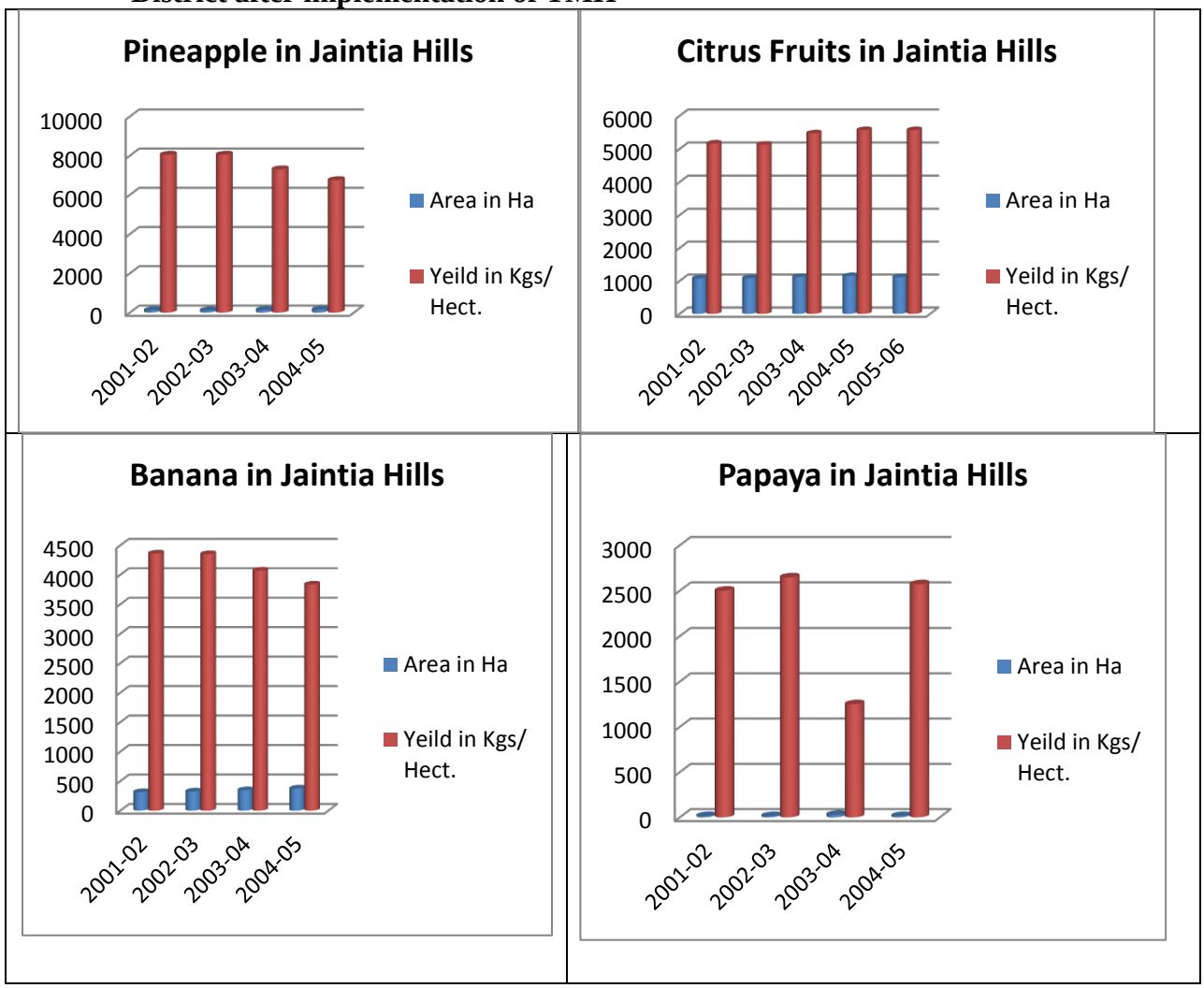
5.6.4 Jaintia Hills

- The district has greater part of the area under subtropical zone and small percentage of area under temperate zone. Crop mix for promotion of horticulture should be fixed accordingly.
- The district has second largest area in the state under the category of cultivable waste land and fallow other than current fallow. Juxtaposed with the locational advantage and high productivity of traditional horticulture crops the district presents an unique opportunity for horticultural growth which can be achieved through crop specific focused interventions.
- As the district is well connected with through road network and Agartala Guwahati National Highway passes diagonally through it adequate storage facilities for horticulture produce should be constructed strategically along the national highway.
- Though the productivity of citrus fruits in the district is second highest in the state of its area continues to be low (Directorate of Horticulture 2004). This calls for focused

approach towards expansion in area under these crops along with greater allocation of physical and financial resources for the development of the same.

- For the cultivation of spices especially Lakadong variety of turmeric the Nongbah-Shangpung belt of the Jaintia hills should be developed as organic spices production zone. A marketing hub of spices needs to be set up at the nearest collection centre.
- Though the district has highest area under sweet potato its productivity remains the lowest in the state (Directorate of Horticulture 2004). This calls for interventions for productivity enhancement in the district.
- Despite the high area of cultivable waste land and fallow land the district has the lowest area under total fruit crops. This calls for sustained efforts towards area expansion under indigenous fruit crops.

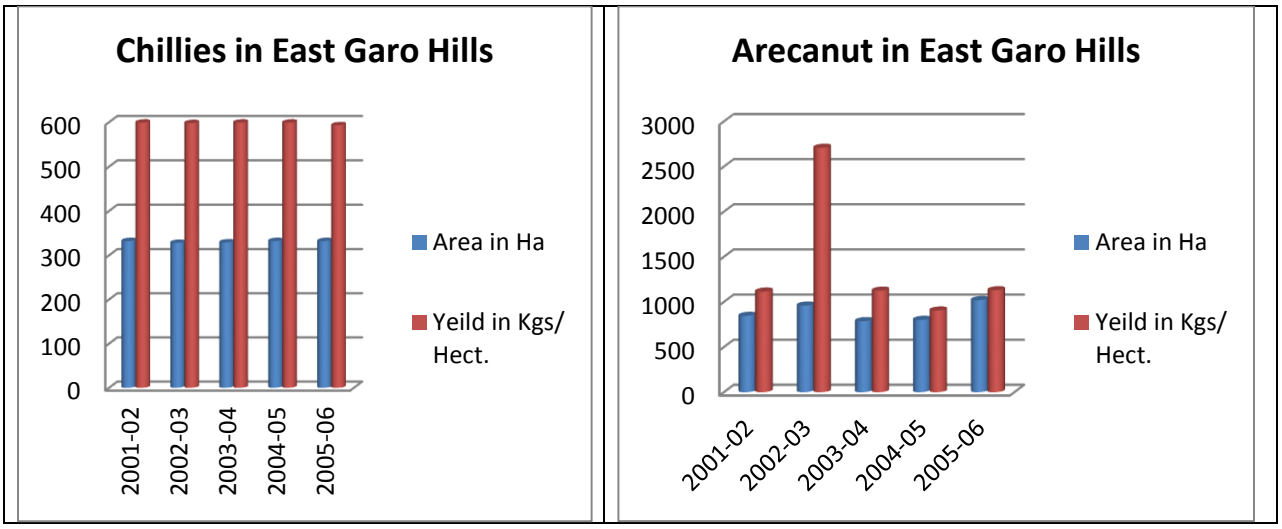
Fig. 5.4 Growth of Area and productivity of major Horticulture crops in Jaintia Hills District after implementation of TMH



5.6.5 East Garo District

- Though district ranks second in productivity of total fruit crops the total area remains low. As larger parts of the district lies in tropical zone this calls for area expansion of traditional crops such as Banana, papaya, arecanut and citrus fruits.
- As the district provides the sole entry and exit points for the entire Garo Hills its locational advantage and good connectivity should be encashed by setting up of regional collection, storage and marketing centre through setting up of adequate infrastructure.
- Though the district has maximum area under cultivation of ginger its productivity is reported to be the lowest (2005). This demands focused intervention for enhancement of productivity technological interventions.
- The district provides ample potential for cultivation of anthurium. The Model Pilot project on Anthurium located at Samgong Horticulture Farm, Williamnagar, needs to be scaled up through greater allocation of resources for setting up of shade houses and drip irrigation
- Farmers growing anthurium besides being linked through Public Private Partnership should be organized on cooperative model.
- Cultivation of off season as well as exotic vegetables should to be expanded by organizing growers' interest groups.
- More number of Horticulture Orchards cum nurseries should be set up in the district.

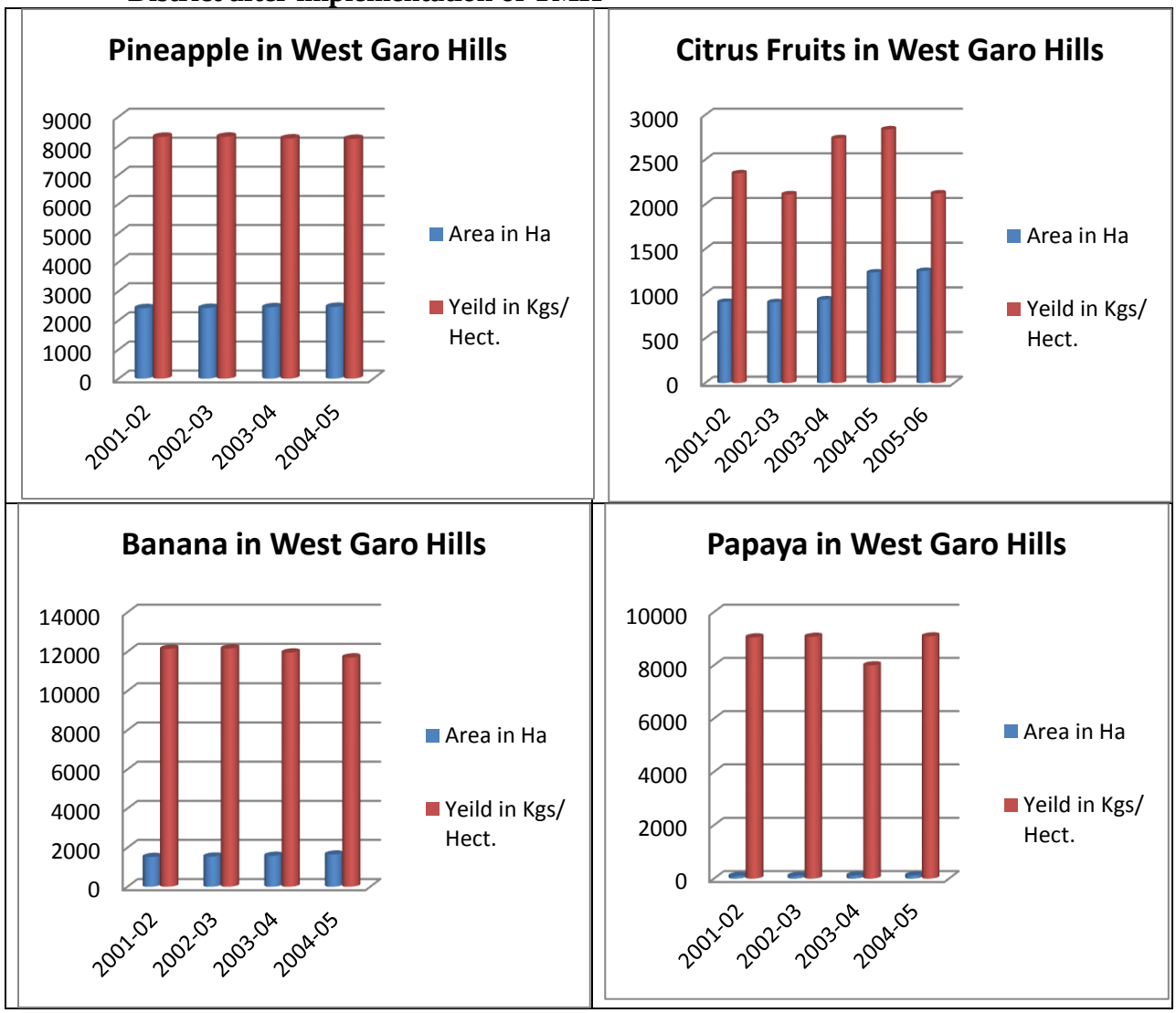
Fig. 5.5 Growth of Area and productivity of major Horticulture crops in East Garo Hills District after implementation of TMH

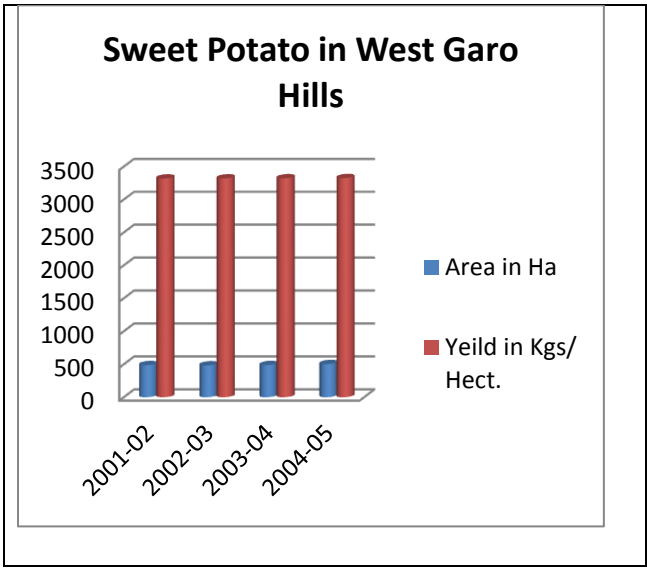


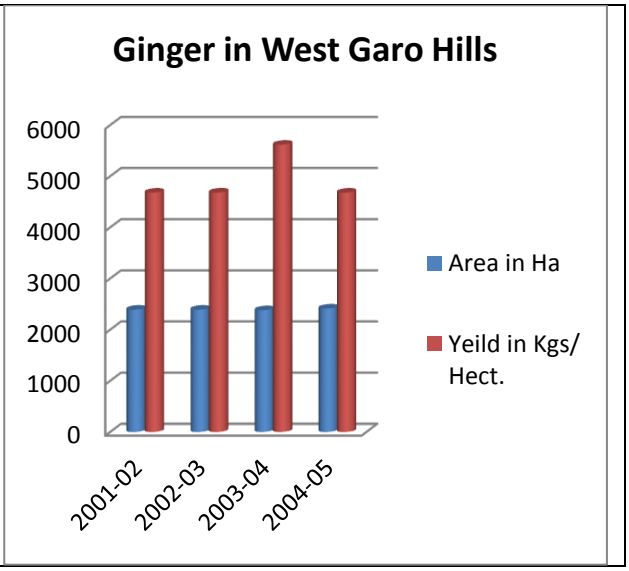
5.6.6 West Garo District

- On one hand fallow plus cultivable wasteland of the district being second highest in state and on the other hand maximum area in the district falling under tropical zone category, the interventions need to be designed towards increase in productivity as well as area expansion of crops such as pineapple, citrus fruits and banana.
- The district has highest area as well as productivity of bananas which indicates towards channelization of efforts towards further development of the crop through technological inputs such as tissue culture.
- The district presents the unique tradition of cultivation of spices such as L. cardamom, bay leaf, cinnamon and black pepper which should be targeted for area expansion through greater financial and physical allocation.
- The district is the leader in arecanut cultivation and ranks second in production of cashewnut and tea.
- Though the district has highest area under cultivation of chillies its productivity remains lower than the state average. This needs interventions targeting productivity enhancement through induced change in horticultural practices at the community level.

Fig. 5.6 Growth of Area and productivity of major Horticulture crops in West Garo Hills District after implementation of TMH



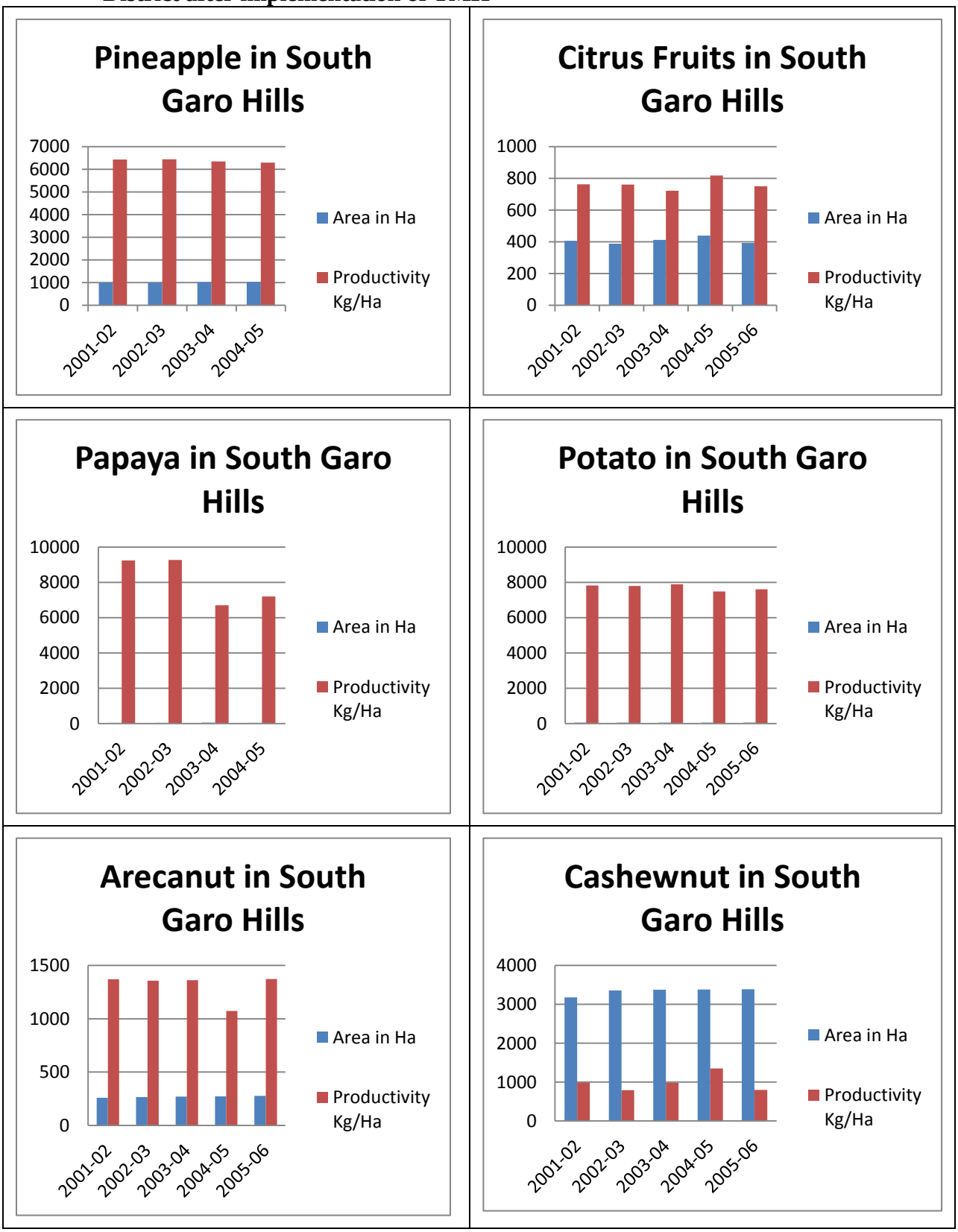




5.6.7 South Garo District

- South Garo is the smallest and one of the most remote districts of Meghalaya. With about 55% area under category of forest the district ranks highest in the state in terms of forest cover. The combination of physical and ecological aspects makes it a potential area for development of horticulture based organic farming of crops such as black pepper, cashewnut, arecanut, coconut, orange, papaya, litchi, grapefruit and tubers.
- Considering the existing area under cropping and high potential of growing different types of plantation crops in the district a district level collection and processing centre may be set up along with more number of horticulture farms and nursery at local level.
- Considering the remoteness of the district Greater allocation of resources for the promotion of horticulture farming at community level needs to be undertaken.
- Considering the fact that productivity of tuber crops is among the highest in the state but their area of cropping remains less than 0.5% of the total in Meghalaya development of these crops needs to be undertaken in a project mode. Setting up of cold storage is required for the development of these crops in the district.
- Considering the decline in productivity of pineapple, citrus fruits and papaya for the period 2001-02 to 2004-05 better interventions needs to be designed for these crops.
- Considering the decline in allocation of resources for the development of spices, medicinal and aromatic crops since 2001-08 fresh impetus is needed for better planning towards development of these crops in the district.

Fig. 5.7 Growth of Area and productivity of major Horticulture crops in South Garo Hills District after implementation of TMH



5.7 Conclusion

It is clear from a cursory enumeration of constraints and opportunities that at both the levels i.e. the state and district will need to discharge their respective functions in a symbiotic manner if the SFAC initiative is to take roots and blossom. Despite the numerous challenges, there is also a need to join efforts and resources in a true and practical PPP (Public Private Partnership) structure to address these challenges. Most importantly, there is also a need to engage the positive mindsets/attitude and help others especially small holder and marginal farmers to have "business oriented mindset" which will position the horticultural industry at a competitive edge. The success of the mission programme lies on how the entire stakeholders perform collaboratively with a common purpose.

CHAPTER VI

Assessment of Programme Sustainability of TMH

6.1 Introduction

Implementation of TMH has discovered and redefined the scenario in the state of Meghalaya. Other related avenues of income generation resulting in over all development of the people around are evident by the implementation of TMH interventions. In this chapter an attempt has been made to enumerate the sustainability of the schemes and the programs as implemented in all the districts of the state. A brief note about the sustainability measures are also discussed later in this chapter. The outcome of these measures in the future development of horticulture sector will surely reflect. Further suggestions are advised to improve in the existing form for future endeavors.

6.2 Scheme wise sustainable measures adopted

There are altogether 17 schemes comprising 74 components studied in the present evaluation study. The National Horticulture Board, Meghalaya supported the implementing agencies with various technical and non-technical supports for better implementation of programmes. In other words, various sustainable measures were taken in consideration for better implementation of the programmes scheme wise. Some of the sustainable measures adopted for particular schemes have been described in Table 6.1.

Sustainable measures adopted for all these schemes are as follows:

1. Area expansion under fruits, flowers, vegetables, plantation crops, spices etc in itself has created great impact among the farming community,
2. Centre of excellence also known as horti hub for demonstration of most of component activities under various schemes,
3. Training of farmer's, SHGs and WSHGs inside and outside the state,
4. Exposure visit in the temperate region and the nearby market for capacity building,
5. Demonstration in farmer's field etc.,
6. Technical assistance for crop production, IPM etc.
7. Creating packaging, storage, transportation and marketing facilities for cut flowers,
8. Market linkage for other farm produce,
9. Financial assistance for agri inputs and equipments on subsidized rate,
10. Identify constraints and suggest remedial measures,
11. Assistance for forewarning for insect-pests infestation and disease control,
12. Technology refinement and imparting training through on farm trials on farmer's fields and training to extension functionaries.

Table 6.1 Scheme wise sustainable measures adopted

S.No.	Scheme	Sustainable Measures adopted
1.	Fruits	• Centre of excellence also known as horti- hub for demonstration of all components. • Training inside and outside the state • Exposure visit in the temperate region and the nearby market • Technical assistance • Packaging and storage facilities • Market linkage • Financial assistance for agri inputs and equipments on subsidized rates
2.	Floriculture	• Dissemination of information through media and publication • Demonstration in farmers field • Packaging, storage and transportation of cut flowers • Training inside and outside the state
3.	Plantation crops	• Technical assistance for crop production, IPM etc • Market linkage • Financial assistance for agri inputs and equipments on subsidized rate
4.	Vegetables	• Centre of excellence also known as horti- hub for demonstration of vegetable crop cultivation such as Red and Yellow Capsicum etc. • Training inside and outside the state • Technical assistance • Market linkage • Assistance for forewarning of pests and disease
5.	Spices, Medicinal & Aromatic Crops	• Demonstration • Technical assistance • Training inside and outside the state • Processing and value addition through project
6.	Use of Plastic-culture	• Financial assistance • Exposure visit • Training inside and outside the state • Technical assistance • Demonstration for cultivation of crops under controlled conditions
7.	Creation of water sources	• Financial assistance • Exposure visit Participation of farmers for maintenance
8.	On farm water management	• Ensuring demonstration in farmers fields as well as in poly-houses maintained by the department of Centre of Excellence, Hortu-hubs or elsewhere. • Technical assistance and Financial assistance
9.	Production of	• Centre of excellence also known as horti- hub for

	planting materials	demonstration of all components. • Technical assistance • Creating Local Market • Financial assistance for agri inputs and equipments on subsidized rate
10.	Transfer of technology	• Technology refinement and imparting training through on farm trials on farmers fields and training to extension functionaries. • Demonstration. • Exposure visit. • Workshops / Seminars etc.
11.	Organic farming	• Technical and financial support • Training and Demonstration
12.	Agriculture equipments	• Financial assistance for agri inputs and equipments on subsidized rate • Training and Demonstration
13.	Bee keeping	• Technical assistance • Financial assistance on subsidized rate • Assistance in kinds i.e. providing a set of Bee Hive and Bee colony
14.	Farm handling units	• Construction cost • Use as temporary collection and storage center.

6.3. Probable effect of the sustainable measures

Study was conducted in 7 districts of Meghalaya viz. East Khasi Hills, West Khasi Hills, Jaintia Hills, Ribhoi, East Garo Hills, West Garo Hills and South Garo Hills. As shown in table 6.1 various types of sustainable measures were adopted scheme wise for better result of the programme.

A. Scheme wise probable effects of sustainable measures illustrates that regarding fruits cultivation, West Garo Hills was on the top followed by Ri Bhoi and East Garo Hills..

B. Evaluating the sustainable measures regarding floriculture it was found that Ri-Bhoi and East Garo Hills are exceptionally well in comparison to other districts. Cut flower production, green house, cold storage facilities at Centre of excellence has been found good in East Garo Hills. Demonstration in farm field, packaging, storage, transportation and marketing facilities for cut flowers, Training inside and outside the state had great impact on beneficiaries.

C. In plantation crops, performance of West Garo Hill is on top followed by South Garo, East Garo Hills and West Khasi. Beneficiaries of these districts were provided with exposure visit in temperate region and nearby market to understand various technical aspects involved in plantation of crops. Beneficiaries were also supported with financial assistance for agri inputs and equipments on subsidized rate. The sustainable measures regarding plantation of crops were introduced in each of the districts but the beneficiaries of East Khasi Hills, Jaintia Hills, East Garo Hills and West Garo Hills performed much better in comparison to the other districts.

D. On vegetable production it was found that highest production was in East Khasi Hill followed by East Garo Hill, West Garo Hill. In these districts vegetable production was comparatively in large scale than other districts. Sustainable measures adopted for vegetable cultivation probably had good impact and effects in these districts. Exposure visit, financial assistance, technical assistance, market linkage pest and disease management really helped a lot to the beneficiaries of these districts regarding vegetable cultivation.

E. In Spices crops, performance of Jaintia Hill is on top followed by East Garo, West Garo Hills

F. Performance of districts on medicinal and Aromatic crop, it was noticed that all the districts have more of less similar results if compared from the tables. Sustainable measures adopted for this scheme were demonstration, assistance for forewarning of pests and disease, financial assistance for agri inputs and equipments on subsidized rate, technical assistance, training inside and outside the state. Beneficiaries of the above mentioned districts adopted these sustainable measures, which helped them in giving satisfactory outputs.

G. District wise performance on use of plastic culture, it was found that East Khasi Hill performed very well followed by Jaintia Hills, East Garo Hills and West Garo Hills. Sustainable measures provided to the districts under this scheme were financial assistance, exposure visit, training inside & outside the state and technical assistance. These measures helped the beneficiaries in soil conservation, on moisture conservation, use and benefits of bird protection net, anti hail net and shade net etc.

H. There were two components under the scheme creation of water resources viz. community tank and tube well. Under this scheme beneficiaries were supported with financial assistance and the farmer's groups are given the responsibility to the care and maintenance of the assets created under this scheme. The observations during the evaluation study showed that impact in all the seven districts were more or less same.

I. On farm water management had components like drip irrigation, mulching, sprinkler irrigation, green house, hi-tech green house, low cost green house, low cost tunnel, over head water tank. Under this scheme beneficiaries were provided technical and financial assistance. Besides this beneficiaries were also provided training.

J. Under the scheme production of planting material big and small nursery development are its component. Assistance provided to beneficiaries district wise under this scheme were demonstration in centre of excellence, training inside and outside the state, exposure visit in the temperate region and the survey for local market, technical assistance, financial assistance etc. Performances of district under this scheme reveals that centre of excellence were very good in East and West Garo Hills.

K. Under the scheme transfer of technology, technology refinement and imparting training through on farm trials and training to extension functionaries. Beneficiaries of all the district probably had good impact and effects of the above mentioned assistance provided to them.

L. Organic farming plays a vital role in the production of crops. Vermi compost is one of the major components of organic farming. Sustainable measures adopted for organic farming were training, financial and technical assistance etc. performance of all the districts under this scheme were found good.

M. Agriculture implements and equipments have a major role in agriculture. From sowing of seeds to crop harvesting, agriculture equipments has major contribution. Under this scheme districts were supported with financial assistance and training on the use of agriculture equipments. Beneficiaries of almost all the districts had good impact of training provided to them.

N. Bee keeping is such a practice that provided handsome economic returns if done successfully. Under this scheme beneficiaries were provided with training, demonstration and financial assistance. Very few beneficiaries of South Garo Hills and East Garo Hills were found doing it in a better way. In other districts, it was almost negligible.

O. Creation of farm handling units have contributed in as temporary collection and storage of farm produce, all the beneficiaries of the districts were benefited under this scheme.

6.4 Good points that emerged from different schemes

Fruit crops

- 100% achievement of financial targets for the X^{th} Plan period (2002-07) and over 98% achievement of financial targets for XI^{th} Plan period up-till 2007-08.
- Reception of special attention to traditional horticulture areas through financial and physical allocation through TMH all across the state.
- About 9% increase in productivity of pineapple for the period 2001-02 to 2005-06 for the entire state.
- 11.5 % increase in productivity of citrus fruits in West Khasi District (2001-02 to 2005-06).
- 10.7 % increase in productivity and 10.6 % increase in area of citrus fruits in Jaintia District (2001-02 to 2005-06).
- 19.7 % increase in productivity of chillies in Ri- Bhoi District and 11 % increase in productivity of chillies in East Khasi District (2001-02 to 2005-06).
- Rejuvenation of orchards and check on dip in production of oranges (Khasi Mandarin) in areas in East Khasi Hills.
- Improved scientific management of senile orchards through project interventions in traditional oranges growing areas.
- Improved cash and food crop management at community level through balanced monoculture of high value cash crops such as strawberry along with continuation of traditional food varieties.
- Remarkable increase in return on investment through strawberry cultivation at individual and group level.
- Shift in livelihood profile of traditional subsistent horticulture farmer towards modern market driven production.
- Change in practice away from non sustainable *Jhuming* system towards settled farming led by successful change agents at local level.
- Easing of daily drudgery of subsistence farmers including women through adoption of Low Volume High Value crops.
- Addition of market value to Traditional Fruits and ornamental cops like Sohiong, Sophi, Pitcher plant etc. through crop development and support schemes such as food processing.

Vegetables

- The most heartening aspect in the vegetable sector is the rise in productivity in most vegetable crops except in cabbage, turnip, bottle gourd and beans.
- Tomato cultivation has become a special adopted feature in the Umsning- Nongpoh belt where the farmers of the region are growing tomatoes in both rabi and kharif season. Tomato cultivation introduced in the high altitudes regions of Khasi Hills is proving to be very successful.
- Appropriate utilization of natural resources supported by high rainfall and climatic diversity through crop diversification towards off season vegetables in high potential areas.
- Adoption of integrated cluster approach for effective project implementation
- Convergence of community based institutional action with government programmes.
- Setting up of 11 Rural Primary markets and two trading Sheds in the state

Other Support Schemes

- Setting up of three Disease forecasting Units two Gardeners training centre and one each of Leaf Analysis Laboratory, Tissue culture laboratory and Plant health clinic in the state.
- Setting up of two cold storages, 45 Nurseries and 845 Earthworm units through TMH interventions in the state.
- Setting up of 1064 green houses, 522 Drip irrigation, 367 sprinkler irrigation, 320 community tanks and 249 tube wells at individual farms.
- Setting up of one each of Model Floricultue Centre, Integrated mushroom unit, Rose model project and Anthurium Model project at centre of high potential areas leading to transfer of technology through scientist/experts farmers interface. This has induced change of practices from subsistence level horticulture towards diversified cropping with high return on investment at cluster level.

6.5 Suggestions

To make the programme more sustainable, following suggestions are recommended:

1. Proper technical support for the implementation of program components is necessary to ensure area specific needs that can be addressed. Community participation at the planning stage also needs to be ensured so that its commitment for sustaining the assets created under TMH is obtained.
2. It is suggested that all work related with the land and water based activities in the area may be taken care of by the concerned village institution duly supported by respective technical line departments.
3. Conservation of water resources should be given top priority.
4. For management of common property resources, community participation should be ensured.
5. Short-term training courses on various attributes may periodically be arranged at the State, District and Block levels.

6. Increase use of HYV by way of Seed Replacement. Necessary tie up arrangement with agencies providing agro-input should be made for pre-positioning of seeds, at the same time preservation of pure line genotypes should also be maintained to conserve the bio diversity.
7. Arrangement for buffer stocking of fertilizer and bio-fertilizer.
8. Farmers training conducted at regular interval of time.
9. Availability of irrigation to be ensured.
10. Availability of desired variety of seeds for direct seeding.
11. IPM measures to be practiced vigorously.
12. Judicious use of natural resources to avoid wasting resources through over-production,
13. Efficient use of resources keeping the capability within limits of the land and water,
14. Conservation of biodiversity, don't break the chain that maintains a healthy living environment, discouraging *Jhoom* cultivation practices,
15. Resilience: Avoid vulnerability to external disruptions-plan ahead and diversify,
16. Pricing policies: Recognize the value of natural resources and cover the costs of using them,
17. Balance: This refers to a balanced external economy to avoid excess pressure on natural capital; perhaps it applies at the farm level as well,
18. Community participation: Involve community in making decisions about sustainable use.
19. Social equity: Consider whether new technology adversely affects other people's livelihood, or treats people unfairly,
20. Global perspective, consider whether development in one place may not cause social problems elsewhere,
21. Qualitative development, consider factors like health and lifestyle which are benefits of development, as well as economic returns.

CHAPTER VII

Case Studies under TMH

7.1 Cases from the Field

Although there was existence of traditional and regional fruit cultivation, but the cultivation was restricted to a small scale. With the intervention of the technology mission, Floriculture, Fruit orchards, Plantations and vegetable cultivation have been done in large scales. This has definitely improved the economic condition of the farmers. Certain cases of such practices have been documented.

Case Study 1: Anthurium cultivation under net house

A government servant with the state, Smt. Hema Sangma of Tura in West Garo Hills received two units (2000 sq. mt. area/unit) for Anthurium Cultivation under area expansion in Floriculture Scheme. The unit per area for Anthurium cultivation was 2000 sq. mts. She received planting materials for Anthurium, coco-pit, agro-chemical and some plant protection chemicals. She also received assistance for drip irrigation system and a low cost green house structure for two units. With all this assistance, she became one of the large scale growers of Anthurium. With a good earning, her weekly income from 2 units of Anthurium cultivation was approximately ₹1800/- (300 cut flower @ ₹ 6/- per cut flower).

Photo 7.1 Anthurium cultivation at Smt. Hema Sangma's plot in Tura

Photo 7.2 Anthurium cultivation at Smt. Hema Sangma's plot in Tura

Case Study 2: Big nursery (Private)

Mr. Silseng Marak of Dabegre village, Baghmara, the district headquarter of South Garo Hills received ₹8 lakhs for the production of planting material, in two installments. The evaluation team enquired details about the disbursement of funds with the District Horticulture Office at Baghamara but the team was not satisfied with the keeping records of the funds and disbursing cash assistance maintained in this office. The team also visited the nursery site as directed by the beneficiary of this component and found nothing to be termed as a nursery, as also shown in the picture below. Even any earth work was not carried out for the establishing a nursery. The beneficiary took the team to his home to show some of the areca nut seedlings grown in his homestead land. The total number of areca nut seedling found there were approximate 2000. The money received by this beneficiary was never monitored for its proper use. The previous DHO of South Garo Hills disbursed the fund to him with no written agreement between the parties for the released cash assistance.

Photo 7.3 Big nursery under progress in Mr. Silseng Marak

Photo7.4 Big nursery in Dabegre village, Baghmara

Case Study 3: Community Tank

A group called Seng Nongrep Tympew, Lamin, was formed under the leadership of Shri Rojen Lamin of Amlaren Block, Jaintia Hills district. It was formed with the objective of Horticultural and Community development. The group proposed a community tank for common use in horticultural purposes. The total project cost amounted to ₹one lakh. Under the Scheme of Creation of water sources, TMH sanctioned and disbursed the amount to the group. The project supported 100% capital cost, whereas community contribution amounted to ₹ 5000/- in the form of labour cost. The maintenance of this community tank is done by the group members for which the group members are contributing a small amount monthly for the repair and maintenance of the tank. The other members of this group are Mr. Morrison Dkhar, Shri Sroi Lamin, Shri Nishol Lamin and Shri WotKhonglah. The community tank was established on February 01, 2003.

Photo 7.5 Construction of community tank in progress in JaintiaHils

Case Study 4: Promotion of Women SHG for Horticulture Development

Promotion of Era Women Self Help Group, for cultivation of Gerbera was done with the installation of a poly house in the Chinemgre village of Samanda Block, East Garo Hills District, to build the capacity of women for horticultural purposes. This WSHG involved 10 women members. This group received assistance regarding Gerbera cultivation were both in cash and kind. The respondent could not tell the aggregated sum of money received for the purpose, as the components included a poly house for an area of 2000 square meter, drip irrigation system, training for production techniques of cut flowers, sapling and a running amount of ₹ 5000/- for recurring cost etc.

Photo 7.6 Cultivation of Gerbera through WSHG in Samanda Block, East Garo Hills

Photo 7.7 Cultivation of Gerbera through WSHG in Samanda Block, East Garo Hills

Case study 5: Cultivation of strawberry in Ri- Bhoi

Shri Ostander Lyngkhoi is one of the pioneers of strawberry cultivation in Ri-Bhoi district hailing from Sohliya village near Umsing. He was one of the first farmers to adopt the cultivation of strawberry on a sizable scale. From a modest beginning of 50 plants Ba Os as he is popularly known now has a strawberry plantation with more than 14000 plants. Prior to strawberries he was cultivating tea, tomato, French bean, peas and paddy. Now he is specialized in growing only paddy and strawberry. In his own words, "Strawberry cultivation is much more profitable than any other crop as we can be assured of at least 50% return on investment". Citing the previous years example whence he got assistance under the Technology Mission Ba Os pointed out that with an investment of ₹60000 he made a net profit of ₹184000 from 10000 plants. Strawberries from his farm as well as from other farmers are being marketed by a private entrepreneur, Ms. S. M. Multipro in a unique PPP marketing model initiative by the department. Having being trained at the benefits of strawberry cultivation Ba Os has transformed himself into a highly effective change agent for the Technology Mission. Due to his effort the village of Sohliya has taken up strawberry cultivation in a big area and is one the cluster area chosen for the cultivation of strawberries under future Technology Mission.

Photo 7. 8 Mr. Ostander Lyngkhoi with his valued harvest of strawberries

Case study 6: Stopping Jhuming through cultivation of pineapple in East Garo Hills

Jhuming or slash and burn cultivation has always been a way of life for the farmers of Koksi Songma a village located in Ronjeng block of East Garo Hill District. Over the years numerous schemes have been tried out to provide the villagers with the viable alternatives to the traditional methods of cultivation but none have been successful. Today through initiatives taken up under technology Mission ten villages have finally accepted settled cultivation and are growing 12 hectares of pineapple on what were previously Jhum lands. The story of Kadok Momin of this village is not a story of profit or economic gain but is example of the paradigm shift in attitude and mind set change that the Mission has been able to affect in this remote area of the country which other programme has not been able to do. Kadok Momin 42 with three children was leading a poverty ridden life till she adopted pineapple cultivation two years back whence earlier she was cultivating for domestic purpose. Now she cultivates for the market and is able to sell her pineapples for ₹5 per Kg in the local markets of William Nagar and Ronjeng which has improved her economic conditions tremendously. Now she does not intend to nor does she want to go back to Jhuming.

Photo 7.9 Kadok Momin showing her healthy pineapple fields

Photo 7.10 Pineapple cultivation is well set to undo the damage done by Jhuming

Case study 7: Transforming livelihoods through cultivation of off season vegetables

Located 20 kms. away from Shillong on the Shillong Mawphlang road the relatively unknown village of Mawkriah can very well claim itself to be the cradle of commercial cultivation of off season vegetables. Till a few years back this tiny hamlet was producing only potatoes. Today thanks to the intervention of the technology mission it has been declared as a centre of excellence for vegetables and produce off season vegetables like cole crops, radish, peas etc. from May to December, a time when production in other states is virtually non-existent. The centre, which comprises of 205 farmers representing eight villages, serves as a demonstration of the success of the cluster approach to horticultural development and has been able to generate surplus production of 700 MT of vegetables in 7 months, fetching revenue of ₹ 1750000. This has enabled the working committee member of the centre to purchase a mini truck with which they transport and market the produce not only locally but to places like Assam, Tripura and Mizoram.

Photo 7.11 Generating wealth through off season cole crop

Case Study 8: Mixed farming of off season vegetables in East Khasi Hills

Shri Blim Sing Khongkliam, 46 years, a progressive farmer in Wah Umrem, Pynursla has a plot of land of three hectares. Through the assistance and technical guidance of the department, he started mixed farming five years ago by growing different types of vegetables. The District Horticulture Officer, East Khasi Hills, Shillong under the Technology Mission Scheme, provided him with poly houses, vermin compost unit, mechanized pump set, sprinkler irrigation system and vegetable seeds. These incentives have enabled him to expand the area under horticulture activities especially for off season vegetable production and have enhanced his annual income to ₹ 150000 from the sale of horticulture produce only. He is now able to sustain and educate his children from the surplus income he receives from his firm. His endeavor serves as a model for the farmers of Pynursla and surrounding villages.

Photo 7.12 ShriBlim Sing Khongkliam with his mixed vegetable farm and poly house

Case study 9: Floriculture by Women SHG in East Khasi Hills

Smt. Bibida Nongbri and Smt. Tinolin Shabong of Mawkriah village were ordinary village housewives, tending to their household duties of raising their children and helping their husbands in their subsistence farming. In 2004-05 these two women decided to take advantage of Technology Mission scheme for women in horticulture and formed two self help groups with the objective to take up horticultural activities to supplement their incomes with an initial seed capital of Rs 5000 the two groups started floriculture nurseries in their villages. Seeing the groups afford to make a better future for themselves the office of the District Horticulture Officer East Khasi Hills provided them with 5 low cost poly houses 1250 numbers of Gerbera seedlings, 500 seedlings of carnation etc. for cut flower production only. Now each group is earning ₹140,000 annually from the sale of cut flowers as nursery plants which has really boasted their income and encouraged them to expand their floriculture activities on their own. Their hard work has paid off and at present the Mawkriah women self help groups have even hired helpers, thereby generating employment to the people of that village. Even more significant is that these women are now serving as role models for women of their villages to emulate.

Photo 7.13 A group member with poly house nursery

Source - Success stories under TMH, Dept. of Horticulture, Meghalaya

ANNEXURE I

List of Beneficiaries (Name, Sex, Age, Village, Block, District)

Sl. No.	Name of the Beneficiary	Sex	Age	Village	Block	District
1	Surith M. Sangma	Male	28	Dasangre	Baghmara	East Garo Hills
2	Benuritha C Marak	Female	41	William Nagar	Samanda	-do-
3	Webster Ch. Marak	Male	90	New Rangmalgre	Samanda	-do-
4	Tarjan Ch. Marak	Male	32	New Rangmalgre	Samanda	-do-
5	Bolin Marak	Male	19	New Rangmalgre	Samanda	-do-
6	Lt.Shri. Balansing Sangma	Male	75	New Rangmalgre	Samanda	-do-
7	Eaklash K. Sangma	Male	35	Pakwakgre	Samanda	-do-
8	Prehenny N. Sangma	Female	40	Chinamgre	Samanda	-do-
9	Hellingson M. Sangma	Male	37	New Rangmalgre	Samanda	-do-
10	Balma Ch. Marak	Male	41	New Rangmalgre	Samanda	-do-
11	Priladine M Marak	Female	46	Ampangre	Samanda	-do-
12	Sengan D Shira	Male	34	Pakwakgre	Samamda	-do-
13	Shri. Hellingson M. Sangma	Male	37	New Rangmalgre	Samamda	-do-
14	Palin Myrthong	Male	40	Pakwakgre	Samanda	-do-
15	Elvarina D Shira	Female	38	Williumnagar	Samamda	-do-
16	Shri. Moniram Sangma	Male	60	New Rangmalgre	Samamda	-do-
17	Shri Nibash Sangma	Male	60	Samamda	Samamda	-do-
18	Shri. Timollin Sangma	Male	32	New Rangmalgre	Samamda	-do-
19	Shri. Dellington Sangma	Male	35	New Rangmalgre	Samamda	-do-
20	Mingsin Ch. Marak	Male	50	Chinemgre	Samanda	-do-
21	Dailen. M. Sangma	Male	32	Pakwakgre	Samanda	-do-
22	Ranjit N Sangma	Male	44	New Rangmalge	Samanda	-do-
23	Samgong Notaline C Marak	Female	39	Williumnagar	Samanda	-do-
24	Roban Ch Momin	Male	35	Samanda	Samanda	-do-
25	Semilla Ch. Manak	Female	37	Williumnagar	Samanda	-do-
26	Borin Ch. Barak	Male	35	Pakwakgre	Samanda	-do-
27	Emalson Ch Marak	Male	40	New Rangmalgre	Samanda	-do-
28	Letesh C Marak	Female	44	Pakwakgre	Samanda	-do-
29	Romth M. Sangma	Male	27	Rangmalgre	Samanda	-do-
30	Labith Sangma	Male	40	Rangmalgre	Samanda	-do-
31	Lumita Marak	Female	23	Williumnagar	Samanda	-do-
32	Pheny N. Sangma	Male	49	Chinemgre	Samanda	-do-
33	Balna Marak	Male	25	New Rangmalgre	Samanda	-do-
34	Pelleng Ch. Marak	Male	26	Pakwafegre	Samanda	-do-

35	Babeng Ch. Marak	Male	32	Pakwafegre	Samanda	-do-
36	Shri Soben Marak	Male	25	Sokadam Balading	Songsak	-do-
37	Shri Pristone Marak	Male	37	Sokadam Balading	Songsak	-do-
38	Shri Nangjon Marak	Male	62	Sokadam Balading	Songsak	-do-
39	Shri Mengnang Marak	Male	21	Sokadam Balading	Songsak	-do-
40	Shri Molik Marak	Male	32	Sokadam Balading	Songsak	-do-
41	Shri Polnath Sangma	Male	74	Sokadam Balading	Songsak	-do-
42	Shri Dilip Sangma	Male	36	Sokadam Balading	Songsak	-do-
43	Shri Sengman Sangma	Male	25	Sokadam Balading	Songsak	-do-
44	Shri Nangsin Marak	Male	36	Sokadam Rongkabok	Songsak	-do-
45	Shri Derom Sangma	Male	53	Sokadam Rongkabok	Songsak	-do-
46	Shri Sengan Sangma	Male	28	Sawegre	Songsak	-do-
47	Shri Sukumar Marak	Male	30	Sawegre	Songsak	-do-
48	Maljan Sangma	Male	40	Sawegre	Songsak	-do-
49	Shri James Cornel Sangma	Male	53	Songsak Bolchugre	Songsak	-do-
50	Shri Soten Sangma	Male	75	Pakwakgre	Samanda	-do-
51	Smt. Phorbon Nongspung	Female	50	Thangshing	Mawkynrew	East Khasi Hills District
52	Ersina Kharumnuid	Female	28	Thangsning	Mawkynrew	-do-
53	Ilip Sohtun	Male	65	Jongksha	Mawkynrew	-do-
54	Andamery	Female	50	Jongksha	Mawkynrew	-do-
55	Phorbon Nongspung	Female	45	Thangsning	Mawkynrew	-do-
56	Jessica Kharumnuid	Female	23	Thangsning	Mawkynrew	-do-
57	Naran Nongrum	Male	57	Jongksha	Mawkynrew	-do-
58	Ridashisha Mylliem Pdah	Female	28	Mawiapbang	Mawkynrew	-do-
59	Mangkara Kharumnuid	Male	22	Thangshing	Mawkynrew	-do-
60	Peter Nonglyer	Male	60	Jongksha	Mawkynrew	-do-
61	Nerin Nongrum	Male	57	Jongksha	Mawkynrew	-do-
62	Kloria Nongrum	Female	52	Jongksha	Mawkynrew	-do-
63	Kansing M.Pdah	Male	39	Mawiapbang	Mawkynrew	-do-
64	Pharbon Nongspung	Female	45	Thangsning	Mawkynrew	-do-
65	Spingbon Kharmalieh	Male	52	Jongksha	Mawkynrew	-do-
66	Ba-aisuklang Tham	Female	35	Mawiapbang	Mawkynrew	-do-
67	Mondalin M. Pdah	Female	45	Mawiapbang	Mawkynrew	-do-
68	Trian Kharkongor	Female	52	Mawiapbang	Mawkynrew	-do-
69	Thrinsila Kharkongor	Female	45	Nongjrong	Mawkynrew	-do-
70	Slobon Nongspung	Female	44	Thangsning	Mawkynrew	-do-
71	Drip Kharkongor	Male	40	Nongjrong	Mawkynrew	-do-
72	Olet Kharsahnoh	Male	46	Jongksha	Mawkynrew	-do-
73	Kloria Nongspung	Female	52	Jongksha	Mawkynrew	-do-

74	Phidriancy Kharumnuid	Female	28	Thangsning	Mawkynrew	-do-
75	Kolet K-Mawlieh	Male	58	Mawiapbang	Mawkynrew	-do-
76	Iorila M.Pdah	Female	38	Mawiapbang	Mawkynrew	-do-
77	Mondalin M.Pdah	Female	47	Mawiapbang	Mawkynrew	-do-
78	Balangstar Songthiang	Male	55	Jongksha	Mawkynrew	-do-
79	Baioti Rangslang	Male	45	Mawiapbang	Mawkynrew	-do-
80	Harles Kharsohnoh	Male	60	Jongksha	Mawkynrew	-do-
81	Phorlim Nongrum	Male	60	Jongksha	Mawkynrew	-do-
82	Nowen Synjri	Male	42	Nongjrong	Mawkynrew	-do-
83	Sarat Kharsohnoh	Male	57	Thangsning	Mawkynrew	-do-
84	Aidlas Mukhim	Female	45	Nongjrong	Mawkynrew	-do-
85	Neselda Kharphuli	Male	45	Nongjrong	Mawkynrew	-do-
86	Iohriti Suting	Female	20	Mawblang	Mawkynrew	-do-
87	Edring Mukhim	Male	70	Nonghali	Mawryngkneng	-do-
88	Piom Lawai	Male	36	Mawiong Sung	Mawryngkneng	-do-
89	Rimilan Nongpluh	Male	25	Kut	Mawryngkneng	-do-
90	Aimili War	Female	45	Nonghali	Mawryngkneng	-do-
91	Seiborlang Warlarpih	Male	30	Mawryngkneng	Mawryngkneng	-do-
92	Philamon Sohtun	Female	50	Kut	Mawryngkneng	-do-
93	Blister Mawthoh	Male	40	Mawryngkneng	Mawryngkneng	-do-
94	Margret Lawai	Female	27	Nonghali	Mawryngkneng	-do-
95	Shahbor Kharsunai	Male	42	Puriang	Mawryngkneng	-do-
96	Basuklang Lawai	Female	72	Mawiong Sung	Mawryngkneng	-do-
97	Dison Nongspung	Male	38	Puriang	Mawryngkneng	-do-
98	Wandaris Surong	Female	25	Mawiong Sung	Mawryngkneng	-do-
99	Kshui Nongrum	Male	22	Nonghali	Mawryngkneng	-do-
100	Oles Dhar	Male	28	Kut	Mawryngkneng	-do-
101	Erina Tariang	Female	40	Jongushen	Amlarem	Jaintia Hills
102	Thiangmon Potam	Female	27	Nongtalang	Amlarem	-do-
103	Kyrmen Xakuna	Female	32	Muktapur	Amlarem	-do-
104	Deba Nonglamin	Female	25	Muktapur	Amlarem	-do-
105	Philbi Langshiang	Female	35	Muktapur	Amlarem	-do-
106	Rmen Lakuna	Female	64	Muktapur	Amlarem	-do-
107	Bles Suting	Female	40	Syndai	Amlarem	-do-
108	Swim Mylliem	Male	35	Syndai	Amlarem	-do-
109	Kaven Buam	Male	50	Amjalong	Amlarem	-do-
110	Kat Tariang	Male	70	Jongushen	Amlarem	-do-
111	Malbi Tariang	Female	33	Jongushen	Amlarem	-do-
112	Harin Lamin	Male	85	Amjalong	Amlarem	-do-
113	Borlin Khovylah	Male	50	Dawki	Amlarem	-do-

114	Rojen Lamin	Male	46	Lamin	Amlarem	-do-
115	Chen Myrchiary	Male	55	Nongtalang	Amlarem	-do-
116	Rajen Lamin	Male	39	Lamin	Amlarem	-do-
117	Kyrshan Rongryi	Male	30	Hawai Sutnga	Amlarem	-do-
118	Boi Bthuh	Male	32	Hawai Sutnga	Amlarem	-do-
119	Khlur Bthulu	Male	25	Hawai Sutnga	Amlarem	-do-
120	Pimon Bthuh	Male	19	Hawai Sutnga	Amlarem	-do-
121	Red Lomurong	Female	30	Hawai Sutnga	Amlarem	-do-
122	Cherish Suja	Female	35	Amlari	Amlarem	-do-
123	Kal Buam	Male	45	Jhangbuli	Amlarem	-do-
124	Susana Nongrum	Female	24	Amlari	Amlarem	-do-
125	Dapmon Syndai	Female	35	Amlari	Amlarem	-do-
126	Phidalis Laka Shiang	Female	35	Jongushen	Amlarem	-do-
127	Ling Polcher	Male	45	Nonstalang	Amlarem	-do-
128	Hoping Sumel	Male	30	Muktapur	Amlarem	-do-
129	Robinson Padu	Male	38	Noyotalavg	Amlarem	-do-
130	Bidud Shadap	Male	35	Hawai Amse	Amlarem	-do-
131	June Tariang	Male	32	Hawai Amse	Amlarem	-do-
132	Sarteng Syrti	Male	48	Hawai	Amlarem	-do-
133	Dapmon Syndai	Female	39	Syndai	Amlarem	-do-
134	Bitus Gayay	Male	39	Dawri	Amlarem	-do-
135	Linity Shylla	Female	35	Jongushen	Amlarem	-do-
136	Europe Rongrgi	Female	30	Hawai Bhoi	Amlarem	-do-
137	Kwang Suliang	Male	40	Hawai Sutnga	Amlarem	-do-
138	Borlin Khorglah	Male	55	Dawki	Amlarem	-do-
139	Aidalin Khonglah	Female	25	Riahjalong	Amlarem	-do-
140	Hemes Lanong	Male	38	Sohkha Shnong	Amlarem	-do-
141	Aiom Pamthied	Female	30	Pdengshakap	Amlarem	-do-
142	Khe Taviang	Female	55	Jarain	Amlarem	-do-
143	Soanis Myrchiang Amdap	Male	58	Nongtalang	Amlarem	-do-
144	Bitus Gayang	Male	39	Dawki	Amlarem	-do-
145	Rowis Syndai	Male	32	Muktapur	Amlarem	-do-
146	Arnest Lyngdoh	Male	25	Jongushen	Amlarem	-do-
147	Norea Talang	Male	50	Muktapur	Amlarem	-do-
148	Willy Pohplet	Male	45	Muktapur	Amlarem	-do-
149	Nomi Potikysnu	Female	62	Irangblang	Amlarem	-do-
150	Moolida Akpar	Female	55	Irangblang	Amlarem	-do-
151	Shen Makri	Male	48	Nongtyrlaw	Umling	Ri-Bhoi
152	Talsm Hyujdoh	Male	45	Nongtyrlaw	Umling	-do-
153	Johu Nongrum	Male	35	Mawiong	Umling	-do-

154	Khel Maring	Male	49	Mawiong	Umling	-do-
155	Herson Makri	Male	43	Mawiong	Umling	-do-
156	Sumil Kakri	Male	40	Pambir	Umling	-do-
157	Lasit Rabha	Male	40	Mawoing	Umling	-do-
158	Phren Maring	Male	50	Pambir	Umling	-do-
159	Reit Masuig	Male	42	Nongtyrlaw	Umling	-do-
160	Dren Makri	Male	34	Nongtyrlaw	Umling	-do-
161	Paulus Makri	Male	43	Pahamshka	Udup	-do-
162	Mariau Mallai	Female	53	Umkon	Umling	-do-
163	Jick Makri	Female	55	Pambirlum	Umling	-do-
164	Sunil Lyngdoh	Male	40	Mawiong	Umling	-do-
165	Jhel Lyngdsh	Male	51	Pahamshken	Umling	-do-
166	Jrang Lyngdoh	Male	30	Mawiong	Umling	-do-
167	Neru Lapang	Male	65	Pambir	Umling	-do-
168	Kati Rabha	Male	28	Pambirlum	Umling	-do-
169	Dut Lyngoloh	Male	42	Mauring	Umling	-do-
170	Dral Maring	Male	25	Mauring	Umling	-do-
171	Rowil Makri	Male	36	Mauring	Umling	-do-
172	Pral Syngkli	Male	38	Mauring	Umling	-do-
173	Klas Makri	Male	75	Nongtyrlaw	Umling	-do-
174	Lros Makri	Male	45	Nongtyrlaw	Umling	-do-
175	Anjella Maiong	Female	38	Umkon	Umling	-do-
176	Sabina Maiong	Female	35	Umkon	Umling	-do-
177	Therina Maiong	Female	35	Umkon	Umling	-do-
178	Flora Maiong	Female	28	Umkon	Umling	-do-
179	Thom Syiem	Female	42	Mawlong	Umling	-do-
180	Bankyntiewlang Women Self Helf Group	Female	45	Mawlong	Umling	-do-
181	Streamles Mawphniang	Female	40	Mawlong	Umling	-do-
182	Thom Syieni	Female	42	Mawlong	Umling	-do-
183	Women Farmer Group	Female	30	Umla Khat	Umling	-do-
184	Kynthuplang Women Farmer Group	Female	35	Umshaken	Umling	-do-
185	Women Farmer Group Iii	Female	50	Umshaki	Umling	-do-
186	Happy Mangu	Female	28	Unshaka	Umling	-do-
187	Anjela Maiong	Female	40	Umkon	Umling	-do-
188	Strebon Makroh	Female	30	Umshaken	Umling	-do-
189	Probina Mynsong	Female	40	Umden	Umling	-do-
190	Smti. Angela Maiong	Female	38	Umkon	Umling	-do-
191	Smti. I. Nongkseh	Female	32	Banbudai	Umling	-do-

192	Smti. Lucy Dewkhaid	Female	45	Erpakon	Umling	-do-
193	Smti. Bernadeth Khongsngi	Female	36	Umran	Umling	-do-
194	Smti. Shadu Imii	Female	28	Plasha	Umling	-do-
195	Smti. Glorinda Mallai	Female	62	Plasha	Umling	-do-
196	Smti. Krelin Shylla	Female	21	Kynton Phanram	Umling	-do-
197	Smti. Iarlis Syngkli	Female	32	Dewon	Umling	-do-
198	Smti. Dia Syiem	Female	70	Dewon	Umling	-do-
199	Smti. Suk Khymdeit	Female	46	Dewon	Umling	-do-
200	Smti. Diatris Mallai	Female	31	Dewon	Umling	-do-
201	Silsery R. Mamak	Male	30	Dabigre	Baghmara	South Garo Hills
202	Kadith R. Sangma	Male	28	Rongrengpal	Rongara	-do-
203	Banseng Marak	Male	38	Rongrengpal	Rongara	-do-
204	Buja R. Sangma	Male	35	Debegri	Baghmara	-do-
205	Arwin P. Marak	Male	38	Rongrengpal	Rongara	-do-
206	Indrusent N. Marak	Male	46	Dabram	Baghmara	-do-
207	Joinson Sangma	Male	35	Mindikgre	Baghmara	-do-
208	Getison Sangma	Male	32	Mindikgre	Baghmara	-do-
209	Spenson Sangma	Male	45	Mindikgre	Baghmara	-do-
210	Julius M Sangma	Male	32	Dabit Bibra	Baghmara	-do-
211	Pidindro Sangma	Male	36	Siju	Baghmara	-do-
212	Klebin Sangma	Male	38	Rongdong	Baghmara	-do-
213	Beldin Marak	Male	24	Naweram	Rongara	-do-
214	Winterson Ranak	Male	65	Dasangre	Baghmara	-do-
215	Jimbert N Marak	Male	30	Masighat	Baghmara	-do-
216	Bansic R Marak	Male	40	Dasangre	Baghmara	-do-
217	Arwin P. Marak	Male	72	Rongrengpal	Baghmara	-do-
218	Ebiris Rynniaw	Male	27	Rongrengpal	Baghmara	-do-
219	Belindro Marak	Male	46	Dasanggre	Baghmara	-do-
220	Seuma N. Sangma	Male	31	Daligre	Baghmara	-do-
221	Rosebin A Sangma	Female	35	Randini	Baghmara	-do-
222	Memika N Marak	Male	30	Randini	Baghmara	-do-
223	Ibina K Sangma	Female	30	Randini	Baghmara	-do-
224	Osallie A Sangma	Female	40	Randini	Baghmara	-do-
225	Silsery R. Mamak	Male	30	Dabigre	Baghmara	-do-
226	Nildosh Sangma	Male	36	Naweram	Rongara	-do-
227	Genon R. Sangma	Male	38	Naweram	Rongara	-do-
228	Millikson Sangma	Male	36	Alokpang	Rongara	-do-
229	Nanitha S Marak	Female	38	Rasighat	Baghmara	-do-
230	Benitha A Sangma	Female	24	Masighat	Baghmara	-do-

231	Winterson Ranak	Male	65	Dasangre	Baghmara	-do-
232	Benitha A Sangma	Female	24	Masighat	Baghmara	-do-
233	Isarabell P Marak	Female	45	Bolsalgre	Baghmara	-do-
234	Julius M Sangma	Male	32	Dabit Bibra	Baghmara	-do-
235	Brellurina R Marak	Female	36	Dabit Bibra	Baghmara	-do-
236	Nanitha S Marak	Female	38	Rasighat	Baghmara	-do-
237	Brellurina R Marak	Female	36	Dabit Bibra	Baghmara	-do-
238	Nanitha S Marak	Female	38	Rasighat	Baghmara	-do-
239	Benitha A Sangma	Female	24	Masighat	Baghmara	-do-
240	Winterson Ranak	Male	65	Dasangre	Baghmara	-do-
241	Jimbert N Marak	Male	30	Masighat	Baghmara	-do-
242	Ebiris Rynniaw	Male	27	Rongrengpal	Baghmara	-do-
243	Belindro Marak	Male	46	Dasanggre	Baghmara	-do-
244	Brellurina R Marak	Female	36	Dabit Bibra	Baghmara	-do-
245	Nanitha S Marak	Female	38	Rasighat	Baghmara	-do-
246	Memika N Marak	Male	30	Randini	Baghmara	-do-
247	Ibina K Sangma	Female	30	Randini	Baghmara	-do-
248	Osallie A Sangma	Female	40	Randini	Baghmara	-do-
249	Arwin P. Marak	Male	72	Rongrengpal	Baghmara	-do-
250	Nanitha S Marak	Female	38	Rasighat	Baghmara	-do-
251	Shri Moren Marak	Male	60	Anogre	Rongram	West Garo Hills
252	Shri. Nanjeng A. Sangma	Male	38	Anogre	Rongram	-do-
253	Shri.Binalson T. Sangma	Male	30	Sa.Dodgre	Rongram	-do-
254	Chribath R. Marak	Male	38	Sasatgre	Rongram	-do-
255	Bali Singh M Sangma	Male	42	Sasatgre	Rongram	-do-
256	Witnen B Marak	Male	64	Ampangre	Rongram	-do-
257	Khangjang A Sangma	Male	45	Anogre	Rongram	-do-
258	Sellitha G Momin	Female	25	Sasatgre	Rongram	-do-
259	Dinen Sangma	Male	37	Ampanggre	Rongram	-do-
260	Joresh A Sangma	Male	62	Chandigri	Rongram	-do-
261	Raseng T Sawgma	Male	21	Chandigri	Rongram	-do-
262	Disem Marak	Male	32	Chandigri	Rongram	-do-
263	Jingin B Marak	Male	74	Anogri	Rongram	-do-
264	Damol D. Sangma	Male	36	Anogri	Rongram	-do-
265	Winen B. Marak	Male	25	Ampanggre	Rongram	-do-
266	Walnang Ch. Marak	Male	36	Chandigre	Rongram	-do-
267	Windam G. Momin	Male	53	Chandigre	Rongram	-do-
268	Senthy Ch. Marak	Male	28	Chandigre	Rongram	-do-
269	Remilla B Marak	Female	30	Anogre	Rongram	-do-
270	Balang Marak	Male	40	Ampanggar	Rangram	-do-

271	Gangcheng A Saryma	Male	53	Anogre	Rongram	-do-
272	Janjate A Sangma	Female	75	Anagre	Rongram	-do-
273	Merini G Mdmin	Female	70	Sasatgre	Rangram	-do-
274	Salmeingson T. Sanyana	Male	36	Sasatgu	Rongram	-do-
275	Shri.Almen Sangma	Male	50	Anogre	Rongram	-do-
276	Shri.Balseng Marak	Male	28	Anogre	Rongram	-do-
277	Shri.Jingku Sangma	Male	45	Anogre	Rongram	-do-
278	Shri.Jimstone Sangma	Male	41	Anogre	Rongram	-do-
279	Shri.Wilsen Sangma	Male	23	Anogre	Rongram	-do-
280	Smt.Gojoni Sangma	Female	57	Anogre	Rongram	-do-
281	Smt.Jimjoni Sangma	Female	44	Anogre	Rongram	-do-
282	Smt.Atchi Marak	Female	50	Anogre	Rongram	-do-
283	Smt.Enjak Marak	Female	85	Anogre	Rongram	-do-
284	Smt.Sarini Marak	Female	35	Anogre	Rongram	-do-
285	Smt.Mereni Marak	Female	24	Sasatgre	Rongram	-do-
286	Shri. Sawen Marak	Male	35	Sasatgre	Rongram	-do-
287	Shri. Emonsing Marak	Male	40	Ditigre	Betasing	-do-
288	Shri. Danseng Marak	Male	37	Damalgre	Rongram	-do-
289	Shri. Dillucks Sangma	Male	64	Walbakgre	Selsella	-do-
290	Shri. Eliazar Marak	Male	57	Nokatgre	Selsella	-do-
291	Shri.Pajilat Sangma	Male	44	Amguri	Selsella	-do-
292	Shri. Ashok Marak	Male	50	Apalgre	Selsella	-do-
293	Shri. Rathin Koch	Male	57	Apalgre	Selsella	-do-
294	Smt.Leena Sangma	Female	44	Sangkaripara	Betasing	-do-
295	Smt.Loretta Sangma	Female	50	Singgimari	Betasing	-do-
296	Shri.Morning H. Marak	Male	57	Wakatagre	Betasing	-do-
297	Shri.Johan Ch.Marak	Male	44	Wakatagre	Betasing	-do-
298	Shri.Densing M.Sangma	Male	50	Wakatagre	Dalu	-do-
299	Shri.Mose Sangma	Male	85	Wakatagre	Dalu	-do-
300	Smt.Girija Sangma	Female	35	Koinadubi	Dalu	-do-
301	Smt. Dahunlang Sohlang	Female	25	Ksehmawnai	Mairang	West Khasi Hills
302	Smt. Bildalin Nongrem	Female	45	Ksehmawnai	Mairang	-do-
303	Shri. Kliss Lyngdoh	Male	30	Mawphanniaw	Mairang	-do-
304	Smt. Artalin Sun	Female	50	Nongdom	Mairang	-do-
305	Shri. Petros Ryntathiang	Male	40	Nongrangoi	Mairang	-do-
306	Smt. Melina Warjri	Female	27	Patharlyndan	Mairang	-do-
307	Smt. Klida Mawlong	Female	42	Patharlyndan	Mairang	-do-
308	Shri. Wusterland Sangriang	Male	72	Nonglynkien	Mawkyrwat	-do-

309	Smt. Twentinoris Nongphlang	Female	38	Phlangdiloin	Mawkyrwat	-do-
310	Smt. Phrilio Imiong	Female	25	Phlangdiloin	Mawkyrwat	-do-
311	Shri. Tairos Shylla	Male	22	Phodjaud	Mawkyrwat	-do-
312	Shri. Skinglan Nongsiej	Male	28	Janepih	Mawshynrut	-do-
313	Shri. Ioannis K. Sohphoh	Male	38	Mawdonglang	Mawshynrut	-do-
314	Smt. Diolin Myrthong	Female	32	Mawruksoin	Mawshynrut	-do-
315	Shri. Dret Mawlieh	Male	45	Mawruksoin	Mawshynrut	-do-
316	Shri. Banjoplang Nongsiej	Male	36	Mawsleh	Mawshynrut	-do-
317	Shri. Boster Nonglang	Male	28	Myndo	Mawshynrut	-do-
318	Smt. Edwina Synnia	Female	62	Myndo	Mawshynrut	-do-
319	Smt. Pril Nongphud	Female	21	Patharkhnang	Mawshynrut	-do-
320	Smt. Briah Nongphud	Female	32	Patharkhnang	Mawshynrut	-do-
321	Smt. Klin Nongphud	Female	70	Patharkhnang	Mawshynrut	-do-
322	Shri. Prestar Lyngdoh	Male	46	Patharkhnang	Mawshynrut	-do-
323	Shri. Ebiona Lyngkhoi	Male	31	Pomdkhar	Mawshynrut	-do-
324	Shri. Arkius Lyngkhoi	Male	50	Pomdkhar	Mawshynrut	-do-
325	Smt. Lehris Lyngkhoi	Female	28	Pomdkhar	Mawshynrut	-do-
326	Smt. Pideng Lyngkhoi	Female	45	Pomdkhar	Mawshynrut	-do-
327	Smt. G. Thongni	Female	41	Seinduli	Mawshynrut	-do-
328	Smt. Prabina K. Bani	Female	23	Seinduli	Mawshynrut	-do-
329	Smt. Model Nongphud	Female	57	Seinduli	Mawshynrut	-do-
330	Shri. Mosting Dkhar	Male	44	Kohkam	Mawthadraishan	-do-
331	Shri. Nathaniel Marshiangbai	Male	50	Lummyrsiang	Mawthadraishan	-do-
332	Shri. B. Mukhim	Male	85	Nongriat	Mawthadraishan	-do-
333	Shri. Kendrowell Syiem	Male	35	Nongriat	Mawthadraishan	-do-
334	Shri Sranliry Lyngdoh	Male	24	Nongrangoi	Nongstion	-do-
335	Shri Waldrik K.Bani	Male	35	Nongrangoi	Nongstion	-do-
336	Smt. Plensi Wanniang	Female	40	Khynrin, Rambrai	Nongstoin	-do-
337	Smt. Bira Rynshiang	Female	37	Nongpyndeng	Nongstoin	-do-
338	Shri. Clement Nongsiej	Male	64	Pyndenglawar	Nongstoin	-do-
339	Iorin Marwein	Male	25	Rambrai	Nongstoin	-do-
340	Shri. Krispin Sangriang	Male	65	Wahlyngdoh	Nongstoin	-do-
341	Smt. Victoria Sangriang	Female	65	Wahlyngdoh	Nongstoin	-do-
342	Komarshah Sanglyne	Male	62	Keniong	Ranikor	-do-
343	Jhumuti Thongni	Male	60	Ranikor	Ranikor	-do-
344	Shri. Fronstar Marwein	Male	55	18Th Mile	Ranikor	-do-
345	Shri. Trikshon Marak	Male	46	Assim Gittim	Ranikor	-do-
346	Shri. Bimson D. Shira	Male	64	Chinapara	Ranikor	-do-
347	Shri. Kandling	Male	35	Laitumsaw	Ranikor	-do-

348	Shri. Khostting Iawphniaw	Male	60	Raibah	Ranikor	-do-
349	Shri. Station D. Shira	Male	60	Ranikor	Ranikor	-do-
350	Smt. Liossi Snaitang	Female	60	Trongpleng	Ranikor	-do-

ANNEXURE II

List of beneficiaries (Types of benefit received under different schemes)

Sl. No.	Name of the Beneficiary	Types of Benefit
1	Surith M. Sangma	Anthurium
2	Benuritha C Marak	Anthurium
3	Webster Ch. Marak	Pineapple
4	Tarjan Ch. Marak	Pineapple
5	Bolin Marak	Pineapple
6	Lt.Shri. Balansing Sangma	Orange
7	Eaklash K. Sangma	Banana
8	Prehenny N. Sangma	Pineapple
9	Hellingson M. Sangma	Cashew nut
10	Balma Ch. Marak	Orange
11	Priladine M Marak	Pineapple
12	Sengan D Shira	Banana
13	Shri. Hellingson M. Sangma	Banana
14	Palin Myrthong	Orange
15	Elvarina D Shira	Orange
16	Shri. Moniram Sangma	Orange
17	Shri Nibash Sangma	Cabbage
18	Shri. Timollin Sangma	Cabbage
19	Shri. Dellington Sangma	Banana
20	Mingsin Ch. Marak	Anthurium
21	Dailen. M. Sangma	Orange
22	Ranjit N Sangma	Black Pepper
23	Samgong Notaline C Marak	Leather Leaf
24	Roban Ch Momin	Anthurium
25	Semilla Ch. Manak	Anthurium
26	Borin Ch. Barak	Orange
27	Emalson Ch Marak	Black pepper
28	Letesh C Marak	Anthurium
29	Romth M. Sangma	Black Pepper
30	Labith Sangma	Black Pepper
31	Lumita Marak	Leather Leaf Form
32	Pheny N. Sangma	Banana
33	Balna Marak	Black Pepper
34	Pelleng Ch. Marak	Pineapple

35	Babeng Ch. Marak	Orange
36	Shri Soben Marak	Cashew-nut
37	Shri Pristone Marak	Cashew-nut
38	Shri Nangjon Marak	Cashew-nut
39	Shri Mengnang Marak	Cashew-nut
40	Shri Molik Marak	Cashew-nut
41	Shri Polnath Sangma	Gerbera
42	Shri Dilip Sangma	Gerbera
43	Shri Sengman Sangma	Gerbera
44	Shri Nangsin Marak	Betel Leaf
45	Shri Derom Sangma	Turmeric
46	Shri Sengan Sangma	Turmeric
47	Shri Sukumar Marak	Turmeric
48	Maljan Sangma	Turmeric
49	Shri James Cornel Sangma	Turmeric
50	Shri Soten Sangma	Turmeric
51	Smt. Phorbon Nongspung	Cabbage
52	Ersina Khaunnuid	Cabbage
53	Ilip Sohtun	Cabbage
54	Andamery	Cabbage
55	Phorbon Nongspung	Cabbage
56	Jessica Kharwamnuiel	Cabbage
57	Noram	Potato
58	Rudishisha M Pdol	Ginger
59	Nangkara Kumrund	Ginger
60	Peter Nengluer	Potato
61	Nerin Nlongrum	Potato
62	Kloria Nongrum	Potato
63	Kangsinghm Pdah	Cabbage
64	Pharbon Nongspmg	Banana
65	Spingbon Kharmalieh	Tomato
66	Baaisuk Langtham	Orange
67	Mondalin M. Pdah	Orange
68	Triancgkre	Anthurium
69	Thrinsila Kherkenger	Floriculture
70	Slobon Nongspung	Floriculture
71	Drip Kherkenger	Pineapple
72	Olet Khassahnoh	Pineapple
73	Kloria Nongsum	Pineapple
74	Phidriancy Khorunmund	Floriculture
75	Kolet K-Mawlih	Floriculture

76	Iorila M. Pdah	Vermi compost
77	Mondalin M Pdah	Vermi compost
78	Balangstar Sthiang	Floriculture
79	Baioti Rilagthar	Potato
80	Harles Kharsohnoh	Potato
81	Phorlim Nongrum	Potato
82	Noren Sangma	Vermi compost
83	Sarat Kharsohnoh	Vermi compost
84	Aidlas Mukhim	Floriculture
85	Neselda Kharphuli	Floriculture
86	Iohriti Suding	Floriculture
87	Shri. Edwing Mukhim	Floriculture
88	Shri. Piem Lawai	Floriculture
89	Shri. Rimilan Nongpluh	Floriculture
90	Smt. Aimili War	Floriculture
91	Shri. Seiborlang Warlarpih	Pineapple
92	Smt. Phlamon Sohtun	Pineapple
93	Shri.. Blister Mawthoh	Pineapple
94	Smt. Margret Lawai	Floriculture
95	Shri. Shehbor Kharsunai	Vegetable
96	Smt. Basuklang Lawai	Vegetable
97	Shri. Deson Nongspung	Vegetable
98	Smt. Wandaris Surong	Vegetable
99	Shri. Kshui Nongrum	Vegetable
100	Shri. Oles Dhar	Vermi compost
101	Erina Jariang	Floriculture
102	Smt.Thiangmon Pohtam	Area Expansion of Coconut
103	Smt. Kyrmen Lakuna	Indigenous
104	Deba Nonglomin	Floriculture
105	Philbi Langshiang	Vermi compost
106	Rmen Lakuna	Vermi compost
107	Bles Suliang	Vermi compost
108	Swim Mylliem	Vermi compost
109	Kaven Buam	Vegetable
110	Kat Taviang	Vegetable
111	Malbi Tariang	Vegetable
112	Harin Lamin	Vegetable
113	Shri. Borlin Khlonglah	Vanilla/Drip Irrigation/Vegetable
114	Shri. Rojen Lamin	Community Tank/Drip Irrigation/Manual Operated

115	Shri. Chen Myrchaing	Vanilla Manual Operated
116	Rajen Lamin	Floriculture
117	Shri. Kyrshan Rngi	Pineapple Area Expansion
118	Shri. Boi Bthuh	Pineapple Area Expansion
119	Khlur Bthulu	Floriculture
120	Shri. Rimon Bthuh	Pineapple Area Expansion
121	Shri. Red Amsyrhong	Pineapple Area Expansion
122	Shri. Cherish Suja	Pineapple Area Expansion
123	Shri. Kal Buam	Pineapple Area Expansion
124	Susana Nongrum	Floriculture
125	Shri. Dapmon Syndai	Vegetable/Training Outside the State
126	Shri. Phidalis Lakashiang	Integrated Pest Management
127	Ling Polcher	Betel Leaf
128	Hoping Sumel	Colored capsicum
129	Robinson Padu	Colored capsicum
130	Bidud Shadap	Colored capsicum
131	Shri.June khyriem	Training for all Crops
132	Shri.Syrteng Syrti	Floriculture
133	Dapmon Syndai	Vegetable
134	Bitus Gayay	Vegetable
135	Linity Shylla	Vegetable
136	Europe Rongrgi	Vegetable
137	Kwang Suliang	Colored capsicum
138	Borlin Khorglah	Vegetable
139	Aidalin Khonglah	Vegetable
140	Hemes Lanong	Colored capsicum
141	Smt.Aiom Pomthied	Vermi Compost
142	Smt.Kle Tariang	Vermi Compost
143	Shri.Loanis Myrchaing Amdap	Drip Irrigation
144	Bitus Gayang	Black Pepper
145	Rowis Syndai	Black Pepper
146	Arnest Lyngdoh	Black Pepper
147	Norea Talang	Vegetable
148	Willy Pohplet	Colored capsicum
149	Nomi Potikysnu	Colored capsicum
150	Moolida Akpar	Colored capsicum
151	Shen Makri	Vegetable
152	Talsm Hyujdoh	Vegetable
153	Johu Nongrum	Black Pepper
154	Khel Maring	Black Pepper

155	Herson Makri	Betel nut
156	Sumil Kakri	Pineapple
157	Lasit Rabha	Coconut
158	Phren Maring	Pineapple
159	Reit Masuig	Coconut
160	Dren Makri	Coconut
161	Paulus Makri	Coconut
162	Mariau Mallai	Arecanut
163	Jick Makri	Orange
164	Sunil Lyngdoh	Pineapple
165	Jhel Lyngdsh	Black Pepper
166	Jrang Lyngdoh	Ginger
167	Neru Lapang	Banana
168	Kati Rabha	Banana
169	Dut Lyngoloh	Arecanut
170	Dral Maring	Ginger
171	Rowil Makri	Black Pepper
172	Pral Syngkli	Arecanut
173	Klas Makri	Arecanut
174	Lros Makri	Ginger
175	Anjella Maiong	Pineapple
176	Sabina Maiong	Pineapple
177	Therina Maiong	Pineapple
178	Flora Maiong	Pineapple
179	Thom Syiem	Salad
180	Bankyntiewlang Women Self Helf Group	Maize
181	Streamles Mawphniang	Salad
182	Thom Syieni	Ginger
183	Women Farmer Group	Salad
184	Kynthuplang Women Farmer Group	Broccoli
185	Women Farmer Group Iii	Salad
186	Happy Mangu	Salad
187	Anjela Maiong	Ginger
188	Strebon Makroh	Broccoli
189	Probina Mynsong	Floriculture
190	Smti. Angela Maiong	Floriculture
191	Smti. I. Nongkseh	Floriculture
192	Smti. Lucy Dewkhaid	Floriculture
193	Smti. Bernadeth Khongsngi	Floriculture
194	Smti. Shadu Imii	Ginger

195	Smti. Glorinda Mallai	Ginger
196	Smti. Krelin Shylla	Ginger
197	Smti. Iarlis Syngkli	Pepper
198	Smti. Dia Syiem	Ginger
199	Smti. Suk Khymdeit	Bettlenut
200	Smti. Diatris Mallai	Pineapple
201	Silsery R. Mamak	Areca nut
202	Kadith R. Sangma	Pineapple
203	Banseng Marak	Anthurium
204	Buja R. Sangma	Banana
205	Arwin P. Marak	Ginger
206	Indrusent N. Marak	Leather Leaf
207	Joinson Sangma	Black Pepper
208	Getison Sangma	Orange
209	Spenson Sangma	Ginger
210	Julius M Sangma	Floriculture
211	Pidindro Sangma	Anthurium
212	Klebin Sangma	Orange
213	Beldin Marak	Orange
214	Winterson Ranak	Tomato
215	Jimbert N Marak	Banana
216	Bansic R Marak	Cabbage
217	Arwin P. Marak	Ginger
218	Ebiris Rynniaw	Potato
219	Belindro Marak	Ginger
220	Seuma N. Sangma	Ginger
221	Rosebin A Sangma	Ginger
222	Memika N Marak	Ginger
223	Ibina K Sangma	Pineapple
224	Osallie A Sangma	Vermi Compost
225	Silsery R. Mamak	Areca nut
226	Nildosh Sangma	Anthurium
227	Genon R. Sangma	Anthurium
228	Millikson Sangma	Anthurium
229	Nanitha S Marak	Orange
230	Benitha A Sangma	Orange
231	Winterson Ranak	Tomato
232	Benitha A Sangma	Orange
233	Isarabell P Marak	Ginger
234	Julius M Sangma	Floriculture
235	Brellurina R Marak	Anthurium

236	Nanitha S Marak	Orange
237	Brellurina R Marak	Anthurium
238	Nanitha S Marak	Orange
239	Benitha A Sangma	Orange
240	Winterson Ranak	Tomato
241	Jimbert N Marak	Banana
242	Ebiris Rynniaw	Potato
243	Belindro Marak	Ginger
244	Brellurina R Marak	Anthurium
245	Nanitha S Marak	Orange
246	Memika N Marak	Ginger
247	Ibina K Sangma	Pineapple
248	Osallie A Sangma	Vermi Compost
249	Arwin P. Marak	Ginger
250	Nanitha S Marak	Orange
251	Shri Moren Marak	Potato
252	Shri. Nanjeng A. Sangma	Potato
253	Shri. Binalson T. Sangma	Potato
254	Chribath R. Marak	Ginger
255	Bali Singh M Sangma	Orange
256	Witnen B Marak	Turmeric
257	Khangjang A Sangma	Banana
258	Sellitha G Momin	Cabbage
259	Dinen Sangma	Turmeric
260	Joresh A Sangma	Orange
261	Raseng T Sawgma	Orange
262	Disem Marak	Orange
263	Jingin B Marak	Turmeric
264	Damol D. Sangma	Turmeric
265	Winen B. Marak	Cashew nut
266	Walnang Ch. Marak	Orange
267	Windam G. Momin	Orange
268	Senthy Ch. Marak	Orange
269	Remilla B Marak	Banana
270	Balang Marak	Cashew nut
271	Gangcheng A Saryma	Turmeric
272	Janjate A Sangma	Banana
273	Merini G Mdmin	Orange
274	Salmeingson T. Sanyana	Orange
275	Shri. Almen Sangma	Turmeric

276	Shri. Balseng Marak	Pineapple
277	Shri. Jingku Sangma	Bee Keeping
278	Shri. Jimstone Sangma	Bee Keeping
279	Shri. Wilsen Sangma	Bee Keeping
280	Smt. Gojoni Sangma	Bee Keeping
281	Smt. Jimjoni Sangma	Orange
282	Smt. Atchi Marak	Pineapple
283	Smt. Enjak Marak	Black Pepper
284	Smt. Sarini Marak	Ginger
285	Smt. Mereni Marak	Banana
286	Shri. Sawen Marak	Banana
287	Shri. Emonsing Marak	Banana
288	Shri. Danseng Marak	Ginger
289	Shri. Dillucks Sangma	Black Pepper
290	Shri. Eliazar Marak	Black Pepper
291	Shri. Pajilat Sangma	Bee Keeping
292	Shri. Ashok Marak	Bee Keeping
293	Shri. Rathin Koch	Pineapple
294	Smt. Leena Sangma	Pineapple
295	Smt. Loretta Sangma	Pineapple
296	Shri. Morning H. Marak	Pineapple
297	Shri. Johan Ch. Marak	Cabbage
298	Shri. Densing M.Sangma	Cabbage
299	Shri. Mose Sangma	Cabbage
300	Smt. Girija Sangma	Vegetable
301	Smt. Dahunlang Sohlang	Vegetable
302	Smt. Bildalin Nongrem	Vegetable
303	Shri. Kliss Lyngdoh	Vegetable
304	Smt. Artalin Sun	Cabbage
305	Shri. Petros Ryntathiang	Ginger
306	Smt. Melina Warjri	Potato
307	Smt. Klida Mawlong	Vegetable
308	Shri. Wusterland Sangriang	Vegetable
309	Smt. Twentinoris Nongphlang	Pineapple
310	Smt. Phrilio Imiong	Vegetable
311	Shri. Tairos Shylla	Vegetable
312	Shri. Skinglan Nongsiej	Anthurium
313	Shri. Ioannis K. Sohphoh	Orange
314	Smt. Diolin Myrthong	Floriculture
315	Shri. Dret Mawlieh	Vegetable
316	Shri. Banjoplang Nongsiej	Anthurium

317	Shri. Boster Nonglang	Pineapple
318	Smt. Edwina Synnia	Orange
319	Smt. Pril Nongphud	Orange
320	Smt. Briah Nongphud	Orange
321	Smt. Klin Nongphud	Orange
322	Shri. Prestar Lyngdoh	Vegetable
323	Shri. Ebiona Lyngkhoi	Strawberry
324	Shri. Arkius Lyngkhoi	Cabbage
325	Smt. Lehris Lyngkhoi	Cabbage
326	Smt. Pideng Lyngkhoi	Vegetable
327	Smt. G. Thongni	Anthurium
328	Smt. Prabina K. Bani	Strawberry
329	Smt. Model Nongphud	Potato
330	Shri. Mosting Dkhar	Anthurium
331	Shri. Nathaniel Marshiangbai	Vegetable
332	Shri. B. Mukhim	Vegetable
333	Shri. Kendrowell Syiem	Strawberry
334	Shri Sranliry Lyngdoh	Strawberry
335	Shri Waldrik K.Bani	Strawberry
336	Smt. Plensi Wanniang	Cashew nut
337	Smt. Bira Rynshiang	Vegetable
338	Shri. Clement Nongsiej	Strawberry
339	Iorin Marwein	Cashew nut
340	Shri. Krispin Sangriang	Banana
341	Smt. Victoria Sangriang	Tomato
342	Komarshah Sanglyne	Vegetable
343	Jhumuti Thongni	Potato
344	Shri. Fronstar Marwein	Vegetable
345	Shri. Trikshon Marak	Vegetable
346	Shri. Bimson D. Shira	Potato
347	Shri. Kandling	Potato
348	Shri. Khostting Iawphniaw	Potato
349	Shri. Station D. Shira	Orange
350	Smt. Liossi Snaitang	Orange

ANNEXURE III

Annex Table 3.1 Physical Achievement under each Component of TMH (MM II) schemes during 2001-08 in Meghalaya (in hectare)

Component	Area Coverage(hectare)							Total
	East Khasi Hills	West Khasi Hills	Jaintia Hills	Ri-Bhoi	East Garo Hills	West Garo Hills	South Garo Hills	
1. Fruits								
(i)Fruits	247	132	142	110	106	118	95	**950**
(ii) Banana	152	215.5	129.5	180	733	306	154	**1870**
(iii) Guava	12	12	12	22	14	16	12	**100**
(iv) Litchi	12	14	12	16	18	15	13	**100**
(v) Mango	12	14	12	16	18	15	13	**100**
(vi) Orange	260	236	338	155	432	373	241	**2035**
(vii) Pineapple	70	115	109	800	337	404	211	**2046**
(viii) Peach / Plum	80	0	0	0	0	1247	0	**1327**
(ix) Passion Fruit	32	23.5	18	16	28	35	38	**190.5**
(x) Indigenous Fruits	81	60	51	36	41	41	20	**330**
(xi) Stone Fruits	106	51	52	52	23	23	15	**322**
(xii) Papaya	14	16	14	14	14	14	14	**100**
(xiii) Strawberry	65	5	35	420	10	35	0	**570**
(xiv) Temperate Fruit	70	20	20	0	0	0	0	**110**
(xv) Kiwi Fruit	60	0	0	10	0	0	0	**70**
Total	**1273**	**914**	**944.5**	**1847**	**1774**	**2642**	**826**	**10220.5**
2. Vegetables								
(i) Vegetables	601	292	303	278	328	350	203	**2355**
(ii) Coloured capsicum	100	60	90	120	240	90	70	**770**
(iii) Vegetables (Cabbage/carrot/cauliflower/ pea/tomato/brocolli)	200	100	100	150	170	210	70	**1000**
(iv) Cherry tomato	0	0	0	0	200	0	0	**200**
(v) Potato & Sweet potato	100	125	25	0	45	20	45	**360**
Total	**1001**	**577**	**518**	**548**	**983**	**670**	**388**	**4685**
3. Spices								
(i) Ginger	147	139	146	193	285	204	74	**1188**
(ii) Turmeric	69	69	436	139	114	119	72	**1018**
(iii) Black pepper	98	49	127	89	220	192	74	**849**
(iv) Large cardamom	5	27	27	24	29	26	26	**164**
(v) Bird's eye chilli	0	0	0	15	0	0	15	**30**
(vi) Tezpatta /Betelvine	28	25	24	27	25	54	22	**205**
Total	**347**	**309**	**760**	**487**	**673**	**595**	**283**	**3454**
4. Floriculture								
(i) Floriculture	44	0	4	30	0	25	0	**103**
(ii) Anthurium	0	0	0	354	926	170	10	**1460**

(iii) Bird of Paradise	50	30	30	30	40	0	0	**180**
(iv) Carnation	0	700	430	80	280	80	0	**1570**
(v) Lilium	50	20	25	55	0	5	0	**155**
(vi) Rose	0	200	240	915	0	0	0	**1355**
(vii) Heliconia	0	0	0	0	100	0	0	**100**
Total	**144**	**950**	**729**	**1464**	**1346**	**280**	**10**	**4923**
5. Plantation Crop								
(i) Cashew nut	50	63	55	45	129	573	575	**1490**
(ii) Coconut	10	10	10	18	18	20	14	**100**
(iii) Arecanut	16	14	13	16	15	14	12	**100**
Total	**76**	**87**	**78**	**79**	**162**	**607**	**601**	**1690**
6. Medicinal Crop	38	40	31	33	34	36	28	**240**
7. Aromatic Plant	6	16	21	19	36	22	15	**135**

Annex 3.2 Physical achievement under each component of TMH (MM II) schemes during 2001-08 in Meghalaya (Number of units)

Component	Area Coverage (Units)							Total
	East Khasi Hills	West Khasi Hills	Jaintia Hills	Ri-Bhoi	East Garo Hills	West Garo Hills	South Garo Hills	
1. Creation of Water Source								
(i) Construction of Community tank	72	29	39	76	42	58	29	**345**
(ii) Tube Wells	63	54	61	157	66	64	47	**512**
Total	**135**	**83**	**100**	**233**	**108**	**122**	**76**	**857**
2. On Farm Management								
(i) Drip Irrigation	86	58	51	80	129	79	64	**547**
(ii) Mulching	43	21	41	44	31	21	17	**218**
(iii) Low cost Green House	114	5	25	104	114	86	66	**514**
(iv) Green House @ Rs. 40,000/- unit of 500 sq.mt.	147	42	52	77	52	78	36	**484**
(v) Low Cost Tunnel	5023	5041	5026	22	15	5021	2410	**22558**
(vi) Sprinkler Irrigation	92	40	3	95	53	54	39	**376**
(vii) Shade net	23643	0	0	24643	47643	19000	2000	**116929**
(viii) Bird protection net	200	0	0	50	0	0	0	**250**
(ix) Anti hail nets	1750	0	0	5394	0	0	3	**7147**
(x) Hi-tech Green house	8	9	7	9	17	6	0	**56**
(xi) Overhead water tank	10	0	0	0	0	0	0	**10**
Total	**31116**	**5216**	**5205**	**30518**	**48054**	**24345**	**4635**	**149089**
3. Production of Planting Materials								
(i) Public Sector								
Big Nursery	5	4	8	7	8	9	3	**44**
Small Nursery	6	2	4	4	3	9	1	**29**

(ii) ***Private Sector***								
Big Nursery	0	0	1	3	1	3	0	**8**
Small Nursery	27	3	2	6	5	3	2	**48**
Herbal Garden	0	0	0	1	2	1	0	**4**
Total	**38**	**9**	**15**	**21**	**19**	**25**	**6**	**133**
4. Transfer of Technology								
(i) Training of farmers	763	767	737	652	687	892	594	**5092**
(ii) Training of farmers outside the state including course fee	375	357	358	358	354	361	352	**2515**
(iii) Training of trainer	54	0	0	0	0	0	0	**54**
Total	**1192**	**1124**	**1095**	**1010**	**1041**	**1253**	**946**	**7661**
5. Organic farming								
(i) Earthworm unit	251	218	209	112	225	223	177	**1415**
(ii) Incentive for organic farming for ginger, large cardamom	177	152	113	201	147	169	152	**1111**
(iii) Certification on organic farming	0	0	26	0	0	0	0	**26**
(iv) Vermi-compost	0	20	20	149	0	0	100	**289**
Total	**428**	**390**	**368**	**462**	**372**	**392**	**429**	**2841**
6. Agricultural Equipments								
(i) Manually operated	218	876	178	376	176	569	250	**2643**
(ii) Power tiller	55	71	62	147	71	72	26	**504**
(iii) Diesel Engine	63	83	76	129	42	111	58	**562**
(iv) Power operated	111	75	72	75	124	127	147	**731**
(v) Electric pumpset	132	50	55	85	150	40	30	**542**
Total	**579**	**1155**	**443**	**812**	**563**	**919**	**511**	**4982**
7. Integrated Pest Management:								
(i) Adoption of I.P.M	1437	1076	1027	1188	1032	663	883	**7306**
(ii) Diseases forecasting unit	1	0	0	0	0	0	0	**1**
(iii) Bio-control laboratory	0	0	0	0	0	0	0	**0**
(iv) Plant Health Clinic	1	0	0	0	0	0	0	**1**
Total	**1439**	**1076**	**1027**	**1188**	**1032**	**663**	**883**	**7308**
8. On Farm Handling Unit	25	18	18	68	22	25	14	**190**
9. Women Development								
Self Help Group	345	297	250	196	283	260	200	**1831**
10. Arecanut Soakage Tank	15	0	10	10	0	5	0	**40**

Note – EKH – East Khasi Hill, WKH- West khasi Hill, EG – East Garo, WG – West Garo, SG- South Garo