



# Horticultural Development under the Mission for Integrated Development of Horticulture (MIDH) in Kolasib District

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## Abstract

*Horticulture seems to get more attention and recognition in Mizoram. This is due to the growing health consciousness among the people, economic viability and feasibility of the horticulture crops, suitability of soil of the land etc. The topography of the state also has a significant contribution for the development of horticulture as large scale industries could not be set up due to the absence of vast flat land and scarcity of mineral resources, power etc. However, the climatic conditions and soil composition of Mizoram is found to be suitable for the cultivation of a vast variety of horticulture crops. Farmers in different regions are slowly weaning away from the age-old practice of Jhum cultivation which is detrimental to the environment and are moving towards permanent farming where they can grow more profitable crops with more environment friendly activities without having to shift and clear new plots every year. Even before the introduction of various Central and State horticulture programs and projects, horticulture occupied a very important place in the lives of the people of Mizoram. The Mizos used to be self-sufficient in foodgrains, fruits and vegetables. They grew most of the horticulture crops that are grown today but at a rather less commercial level. Most crops they grew were for their consumption alone. They hardly thought of making profits. However, during those days, they gave more emphasis on cereals particularly rice which is the staple food item of the Mizos since time immemorial.*

**Keywords:** Horticulture, resources, topography, development, activities, Farmers, profitable, program, project, commercial, crops.

## Introduction

Horticulture (Latin hortus = garden; cultura = cultivation), is the science and art of growing fruits, vegetables, flowers, shrubs and trees<sup>1</sup>. It originally meant the practice of gardening and, by extension, now means the cultivation of plants once grown in gardens. It includes the growing of fruits (especially tree fruits), production of vegetable crops, production of flowers, and ornamental horticulture, known as landscaping gardening, which includes the maintenance and design of home grounds, public gardens and parks, private estates, botanical gardens, and recreational areas such as golf courses, football fields and baseball diamonds.

The formation of the Department of Agriculture since the inception of Union Territory (UT) in 1972 was an important milestone for the development of agriculture and its allied activities including horticulture. Another important milestone was achieved with the formation of Horticulture Department as a full-fledged department on 2<sup>nd</sup> September 1997. Since its inception in 1993, the Department has been implementing various horticulture schemes of the Central and State

<sup>1</sup> Singh, Bijender, (2009), *Horticulture at a glance*, New Delhi: Kalyani Publishers, pp.1.

governments till today. Schemes such as Technology Mission for North-Eastern States (TMNE), National Mission on Medicinal Plants (NMMP), Mission for Integrated Development of Horticulture (MIDH), Rashtriya Krishi Vikas Yojana (RKVY), Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) etc., are some horticulture schemes being implemented in Mizoram. The State Government has also been undertaking many horticultural activities through programs such as New Land Used Policy (NLUP), New Economic Development Policy (NEDP) and State Economic Development Policy (SEDP) as drawn up under various governments formed by different political parties.

Horticulture development programmes currently implemented in the state may be discussed as follows:

### **Mission for Integrated Development of Horticulture (MIDH)**

MIDH can be regarded as the most important horticulture scheme which is being implemented for the development of horticulture in Mizoram. It is a Centrally Sponsored Scheme (CSS) implemented in Mizoram, formulated purely for the holistic growth of horticulture alone throughout the country covering horticulture sectors such as fruits, vegetables, root & tuber crops, mushrooms, spices, flowers, aromatic plants, coconut, cashew, cocoa and bamboo. Under the scheme the Central Government contributes 100 percent of the fund from the total outlay of the scheme (Operational Guidelines of MIDH, 2014. P.6). Other states in the Northeast also enjoy similar funding pattern, where they do not need to have contribution to the total outlay of the scheme. However, the matching share between the Centre and states other than the Northeast States has been 85:15. In case of the National Horticulture Board (NHB), Coconut Development Board (CDB), Central Institute for Horticulture (CIH) and the National Level Agencies (NLA), the Central Government contributes 100 percent. Technical advice and administrative support to State Governments/State Horticulture Missions (SHMs) for the Saffron Mission and other horticulture-related activities like the Rashtriya Krishi Vikas Yojana (RKVY) are also provided by the Mission.

The MIDH was formulated in 2014-2015 and became operational in the same year. It integrated various on-going horticulture schemes in different parts of the country. The schemes which were subsumed by the Mission to be its sub-missions are:

1. *National Horticulture Mission (NHM)*: It was launched in 2005-2006. This mission has been implemented in all States and Union Territories except the Northeastern States and states in the Himalayan region.
2. *Horticulture Mission for Northeast & Himalayan States (HMNEH)*: It was launched in 2010-2011 and became a part of MIDH since 2014-2015 when MIDH was launched to subsume the existing schemes implemented in the country. Previously, it was known as 'Technology Mission for North-Eastern States (TMNE)'. This Mission covers all the Northeast States including Sikkim and the Himalayan regions such as Jammu & Kashmir, Himachal Pradesh and Uttarakhand.
3. *National Bamboo Mission (NBM)*: This Mission was started in 2006-2007. It was subsumed by MIDH to be one of its sub-missions in 2011-2012. NBM has been implemented in all the States and Union Territories.
4. *National Horticulture Board (NHB)*: It was set up in April 1984 to improve integrated development of horticulture-based industries and to help in coordinating and sustaining the production and processing of fruits and vegetables. All States and Union Territories have been placed under its purview since its inception.
5. *Coconut Development Board (CDB)*: It was established in January 1981 with a focus to increase productivity and product diversification. The Board covers all States and Union Territories where coconut is grown.
6. *Central Institute for Horticulture (CIH)*: It was set up by the Government of India on March 2006. It is located at Medziphema, Nagaland. The institute was set up to provide technical support on various aspects of horticulture for the holistic development in the North East Region through human resource development and capacity building.

MIDH is so structured to be implemented through various levels from national to district or different levels of Panchayati Raj Institution. At the national level, a General Council was established to be chaired by the Union Minister of Agriculture. The General Council has an Executive Committee (EC) headed by the Secretary, Department of Agriculture & Cooperation. The Executive Committee is to oversee the activities of the Mission and approve Action Plans of State Horticulture Missions and national level agencies. At the State level, there is a State Level Executive Committee (SLEC) chaired by the Agricultural Production Commissioner or Principal Secretary Horticulture/Agriculture/Environment & Forests. It was set up to oversee the implementation of programmes of the respective States. The Committee is also entrusted with multiple functions such as preparation of Strategic/Perspective and Annual State Level Action Plan, organize base-line survey, clear project-based proposals, receive funds from National Mission Authority, State Government and other sources for carrying on the Mission's activities, release funds to implementing agencies etc. At the district level, a District Mission Committee (DMC) is formed to be responsible for carrying forward the objectives of the Mission for project formulation, implementation and monitoring. In the case of HMNEH states like Mizoram, the Committee is headed by the Deputy Commissioner/District Collector. The Guidelines also provides some provisions for Panchayati Raj Institutions to be an important body for the smooth implementation of the Mission. They are expected to have a role in

crop identification, training and awareness creation and giving feedback to the concerned government functionaries. The formation of Technical Support Group (TSG) is also an important aspect of MIDH. As per the Guidelines, National Horticulture Mission (NHM) and National Bamboo Mission (NBM) are being supported by National Horticulture Board (NHB) and Horticulture Mission for Northeast and Himalayans (HMNEH) and Vegetable Initiative for Urban Clusters (VIUC) by Small Farmers Agribusiness Consortium (SFAC). For post-harvest management and cold chain projects across NHM and HMNEH, technical support is provided by the National Centre for Cold-chain Development (NCCD). Service providers can also be engaged for providing technical services in accordance with the Terms of Reference laid for the purpose and approved by the Executive Committee (Operational Guidelines of MIDH, 2014).

### **MIDH in Mizoram**

MIDH has been implemented in Mizoram since the inception of the programme in 2014. As a matter of fact, it is merely a continuation of the on-going scheme of Horticulture Mission for Northeast and Himalayan (HMNEH) which had commenced from 2010-2011 (formerly known as Technology Mission for Northeast (TMNE)). It is regarded as the most important horticulture scheme being implemented in the state as it is formulated solely for the development of horticulture throughout the country. As Horticulture Department was assigned to be the agency for formulation of the Mission's components and their implementation, it has worked out various areas of horticulture activity from the very start of the mission.



### Fund Allocation and Areas of Implementation under MIDH in Mizoram for 2014-2021

Sl. No	Component	2014-2015			2016-2017			2017-2018			2018-2019			2019-2020			2020-2021		
		Physical Target (Ha)	Target Covered (Ha)	Financial Alocation (in Lakhs)	Physical Target (Ha)	Target Covered (Ha)	Financial Alocation (in Lakhs)	Physical Target (Ha)	Target Covered (Ha)	Financial Alocation (in Lakhs)	Physical Target (Ha)	Target Covered (Ha)	Financial Alocation (in Lakhs)	Physical Target (Ha)	Target Covered (Ha)	Financial Alocation (in Lakhs)	Physical Target (Ha)	Target Covered (Ha)	Financial Alocation (in Lakhs)
I	Production of planting Materials			100			50	5	5	50		20							
II	Establishment of new Garden																		
	1. Fruits	1492	1492	690.70			523.3251 100	1070	1070	1014	600	600	348	980	980	639.95	1550	1550	905.05
	2. Vegetables	140	140	35	400	400	20	560	560	140	500	500	125	708	708	177	700	700	175
	3. Flowers	52	52	26	50	50	25	20	20	10	80	80	40						
	4. Spices	480	480	72	340	340	51	61.66	61.66	9.25	300	300	45	550	550	82.50	500	500	75
	5. Aromatic Plants	10	10	4															
	6. 1 <sup>st</sup> Year of Maintenance	825	825	87.56	270	270	45	380	380	62	730	730	202	500	500	110	500	500	140
	7. 2 <sup>nd</sup> Year of Maintenance	1000	1000	87															
III	Rejuvenation/ Replacement of Senile Plantation, canopy Management	2000	2000	400	1600	1600	320	500	500	100							600	600	120
IV	Creation of Water Sources	596 No	596 No	681	162 no	162 no	266.3	690 no	690 no	862		450				415			550
V	Protected Cultivation	279995 sqm	279995 sqm	692.59			481.8					470.85				244.95			431.84
VI	Integrated Pest/ Nutrient Management (IPM/INM)	8740	8740	104.88	15000	15000	180	19867	19867	238.4	13000	13000	156				10000	10000	120
VII	Establishment of Centre of Excellence for Horticulture	1 No	1 No	500	4 no	4 no	100												

VIII	Pollination Support through beekeeping	2655 N0	2655 N0	21.24			723			186								
IX	Horticulture Machanization	650 No	650 No	97.50	888 no	888 no	186					140						112.5
X	Human Resource Development			175.17			30					174.52			93			77
XI	Intergrated Post Harvest Management			36.4						140		50			128.5			244.2
XII	Special Intervention			10								110						
XIII	Mission Management			278						798.46		268.4			262.40			258.99
															5			



During 2014-2015, fund allocated to Mizoram for the implementation of different horticulture activities under the scheme was Rs. 4100 lakhs. The details of fund allocation against each component were as given in the above table. During this first year of the implementation, 13 areas of activities/components were carried out. The concerned department could successfully cover its target areas of land by utilizing all funds allocated. For the year 2015-2016, fund amounting to Rs. 3833.33 lakhs were allocated to the State. New areas of activities such as Research and Development, Organic Farming and Establishment of Marketing Infrastructure for Horticulture Crops were added to be the component of the Mission and implemented as per action plan. The funding pattern for the Northeast States has also been made as 90:10 between Government of India and the States Government since this year. As can be seen in the below table, the total fund allocated for different components of the scheme during 2016-2017 was approximately 3400 lakhs. During this year of implementation, emphasis was given to Integrated Post Harvest Management by allocating more than Rs. 700 lakhs. Setting up of cold storage facilities, sorting and grading facilities etc., in different horticulture centres were the initiatives taken under this component. For the implementation of eleven subcomponents of the scheme during 2017-2018, an allocation of Rs 4600 lakhs (approx) was assigned and utilized as per the plan. Among the horticulture crops, cultivation of fruits continued to be the activity that acquired largest fund allocation that is more than 1000 lakhs rupees. Construction of community water tanks, individual water tank etc., under the component of Creation of Water Sources and construction of different types of greenhouses under the component of Protected Cultivation are other areas of the scheme where emphasis was given. As enumerated in the above Table during 2018-2019, a new component that is *Special Intervention* was introduced for tackling any issues that may come up in the process of the implementation of the scheme. For this component, Rs. 110 lakhs were allocated and utilized. For all the components listed in the plan, Rs. 2500 lakhs (approx) were allocated and utilized. The area of land to be covered during this period was also successfully covered. As seen in the table only nine components of the scheme were implemented during 2019-2020. The components in the previous year's such as Production of Planting Materials, Integrated Pest/Nutrient Management, Horticulture Mechanization, Special Intervention, Mission Management were not included in implementation during this year. Cultivation of flowers was also not implemented. However, the component named Establishment of Marketing Infrastructure for Horticulture Crops to assist horticulture farmers in selling off their produces was introduced once again to be an important component of the scheme. In the year 2020-2021, the scheme was once again implemented under the eleven components listed in the plan. The components which were excluded in the last year of implementation were brought back to be the area of activities. The total amount of fund allocated during this period was Rs. 3300 lakhs (approx). The target area of land was also successfully covered with the utilization of allocated fund.

### **Implementation of the Scheme**

Mizoram is fortunate enough to be able to continue the implementation of Horticulture Mission for Northeast and Himalayas (HMNEH) even after it was subsumed by MIDH in 2014. As a matter of fact, MIDH was inspired by the result of the successful implementation of HMNEH by the concerned states including Mizoram. For the first year of implementation, Mizoram and other Northeast States, received 100% funding from the Central Government. However, from the second year of implementation (2015-2016) till date, the scheme was modified by the Government of India to be funded by both the Central Government and the State Government in the ratio of 90:10.

In Mizoram, HMNEH/MIDH has been implemented in all districts covering the length and breadth of the states. So far, thousands of farmers have been assisted since the inception of the scheme. The role being played by the District Horticulture Offices, Sub Divisional Offices and the technical staff (field staff such as Demonstrator, Circle Officer etc.) in the process of implementation of the scheme is worth mentioning. In fact, they have been the backbone of the scheme as they carry out the work of monitoring, inspecting and guiding the farmers by visiting the farmers' field even in the remotest area. As highlighted, HMNEH/MIDH has been implemented in different areas of activity, some important horticulture crops/activities which have been undertaken under the scheme since its inception are:

1. **Production of Planting Material:** Good quality planting material is necessary to have better plant capable of producing more fruits with better quality and number. Even in the case of other crops bearing no fruits, better planting materials leads to more produces with better quality. Due to global climate change, rising number and threat of pests which can cause even total failure of the cultivation of some crops, increasing demand of horticulture fruits, vegetables etc., production of more tolerant horticulture crops has become the biggest challenge of the horticulture experts. Keeping this situation in view, the Horticulture Department has been undertaking the subcomponents of work such as High-Tech Nursery, Import of Planting Materials, Upgradation of Nursery Infrastructure to meet accreditation norms, Import of seeds etc. So far, about Rupees 35 (Thirty-Five) lakhs has been spent covering around 38 (Thirty-Eiht) hectare of land under the scheme since its introduction in 2014-2015.



High Tech Nursery is nursery equipped with advanced technology having controlled temperature, advanced vending system, computerized drip irrigation etc. Since the inception of the scheme, High Tech Nurseries have been set up in three Horticulture Centres of Excellence such as Lunglei Centre of Excellence, Thiak Centre of Excellence, Thingdawl Centre of Excellence and Chite Horticulture Centre. However, as of today, nurseries under Lunglei Centre of Excellence alone can continue working as a High-Tech Nursery.

Import of planting materials is also sometimes necessary to have better products as the local grown crops sometimes fail to produce desirable result. Crops like Dragon Fruit, Anthurium (Flower) etc., were imported from other states and foreign countries at the initial stage of mission implementation. These crops were not known to many in the State before they were introduced by the Horticulture Department. Apart from the contributions made by indigenous crops, the imported crops also made a tremendous contribution in the development of planting materials in Mizoram.

Development of nurseries owned and managed by the Department to be able to get accreditation has also been an important task under the scheme. The Department is has established nurseries in every district, division and subdivision to meet the demands of the farmers. All the Department-owned nurseries could successfully get accreditation but subject to revision after every 5 years. This accreditation is given by Central Institute of Horticulture, Nagaland.

2. **Fruits:** Since the inception of the mission, development of the cultivation of fruits has been given special emphasis to be an important component of the scheme. Dragon Fruit, Kiwi, Papaya, Banana, Mandarin Orange, Strawberry, Grape, Mango, citrus fruits etc., are the fruits covered under the scheme. Four subcomponents of the scheme such as Establishment of New Gardens, First Year of Maintenance, Second Year of Maintenance and Rejuvenation/Replacement of Senile Plantation, Canopy Management have been implemented for the development of fruits. Since the introduction of the Mission, about Rs. 7116 lakhs have been spent covering about 22130 hectares of land.

*Photoplate No. 3: Farms of Lalzarliana, Kolasib District, where Dragon Fruits are cultivated under MIDH*



3. **Vegetable:** Vegetable has been an important part of the scheme since the first year of its implementation. About Rs. 1551 lakhs have been spent covering more than 5881 hectares of land to produce vegetables for the entire State under the scheme. Production of different vegetables such as Tomato (Greenhouse and Open), Off-season Cabbage, Chinese Cabbage, Broccoli, Lady's finger, Bean, Capsicum etc., are undertaken. To produce more vegetables, the Department has imported hybrid seeds of different vegetables from other states.



4. **Flower:** Cultivation of Anthurium, Rose etc., was undertaken under one of the components, *Flower*, from the start of the scheme till 2018-2019. About 272 hectares of land had been covered by spending more than Rupees 454 lakh. Anthurium has now become one of the most popular flowers in the State since it was imported from Holland in 2006. This flower has been exported to other states and foreign countries as well. The intervention of MIDH has greatly boosted the production. It is in high demand for many occasions and events such as funeral, wedding, government events etc.



5. **Spice:** Cultivation of Spices have been an integral part of MIDH and undertaken every year since its inception. Turmeric, Chilli (Seed Spice), Ginger etc., have been chosen as the spices for implementation. So far, about 2812 hectare of land has been covered with an expenditure of approximately Rs. 454 lakhs.
6. **Mushroom:** Under MIDH, mushroom cultivation was undertaken only for three years between 2015-16, 2016-2017 and 2017-18. During the implementation, Oyster Mushroom alone had been taken up. To promote mushroom cultivation, the Department had set up nurseries for mushroom at Chite Horticulture Centre (Aizawl District), Lunglei, Tuidam (Mamit District), Champhai, and Thingdawl (Kolasib District) where farmers can collect planting material (Spawn) on subsidized price.

7. **Aromatic Plant:** Realizing the necessity of essential oils for the wellbeing of man, cultivation of aromatic plants was included to be a part of the scheme. However, it was included only for two years, that is, 2014-2015 and 2015-2016. Aloe Vera and Citronella cultivation were undertaken under this component. About Rs. 20 lakhs were spent to cover 50 hectares of land during the period of implementation.
8. **Creation of Water sources:** Abundant supply of water is a prerequisite for the successful cultivation of any crop. Though Mizoram is receiving abundant supply of rainfall during monsoon season, practicing cultivation of fruits and vegetables during the dry season has always been a tedious task except for those who have farms on the riverbanks. Keeping in view this difficult situation, the sub-component 'Creation of Water Sources' under MIDH has been carried out every year to make water available for farmers particularly those who are dealing with winter crops/Rabi crops. So far, 44 community water tanks in different villages have been constructed with an expenditure of Rs. 1100 lakhs, water harvesting system for individuals has also been carried out under which about 3093 individual water tanks were constructed with an expenditure of more than Rs. 2783 lakhs. At the initial stage of implementation of the scheme, individual water tanks were of Reinforced Cement Concrete (RCC). Later, prefabricated and Geomembrane tanks have been provided to farmers. The capacity of individual water tank provided to farmers under MIDH is 15000-20000 litre.
9. **Protected Cultivation:** Cultivation of horticulture crops under protected area (Greenhouse and Shade House) has become popular in Mizoram especially after the introduction of the Centrally Sponsored Schemes like MIDH/HMNEH, RKVY etc., as these schemes provide more funds for the purpose. Greenhouses and Shade Houses (Protected Cultivation) are used to cultivate crops mostly to protect them from extreme climate and weather such as intense heat, cold, storm, excessive rainfall etc. They are also used to grow crops during off-season. Tomatoes, Beans, Anthuriums, Roses etc., are some crops cultivated under protected environment in the state. Production of quality planting material of vegetables, fruits and flowers is also carried out in protected cultivation. Since the inception of the scheme, several Greenhouses (Tubular Structure), Shade Net Houses (Wooden Structure) covering more than 12,91,882 sq.m have been constructed with an expenditure of Rs. 2,263 lakhs. The funds available under this Protected Cultivation are also being utilized for the cost of planting materials of high value vegetables grown in poly houses.



10. **Promotion of Integrated Pest Management (IPM):** Most horticulture crops need special care to produce more. However, these crops have many enemies which can adversely affect their productivity and cause even their death. Pests of different kinds have been the worst enemy of fruits and vegetables since time immemorial. To meet this challenge, Pest Management has been an integral part of the scheme since the first year of implementation. So far, an amount of Rs. 304 lakhs have been spent to cover more than 25,396 hectares of land. Under Integrated Pest Management, distribution of pesticides alone has not been the activity, but imparting knowledge through trainings, demonstrations, monitoring and inspections on how to handle these chemicals have also been given special attention.
11. **Promotion of Integrated Nutrient Management (INM):** Another measure which has been taken up for special care of the horticulture crops is to provide abundant supply of fertilizers and other nutrients. Soil loses its fertility after two or three years of cultivation. To ensure better growth and better productivity of crops, soil fertility must be maintained. Under MIDH, Promotion of Integrated Nutrient Management has been undertaken every year from the start of the implementation of the

scheme. So far, more than 62,235 hectares of land has been covered by spending more than Rs. 746 lakhs for this purpose.

12. **Pollination Support through Beekeeping:** Bees are known as great pollinators since long time back. Their contribution to the growth of horticulture has also been acknowledged. Honeybee Colony and Bee Hives were undertaken under MIDH in 2014-2015 and 2015-2016. More than Rs. 30 lakh was spent to distribute about 4,335 ready-made boxes (beehives) to the Apiarists.
13. **Horticulture Mechanization:** The application of machines could bring desirable changes in respect of land preparation, weeding and even in the process of harvesting. The use of machine means faster work within lesser time, quality product, lesser demand for manpower etc. Thus, mechanization of horticulture has become an important aspect of MIDH/HMNEH in Mizoram. So far, funds amounting to more than 838 lakhs rupees has been spent to purchase more than 4800 machines and equipment such as Power Tillers (8 bhp and above), Power Tillers (below 20 bhp) for land development - tillage and equipment for seed bed preparation, digging, planting and sowing. These purchased machines were later distributed to the farmers at subsidized rate.



14. **Human Resource Development:** Development of manpower has always been the most noticeable feature of government initiatives as their success or failure very much depends on the personnel who are in-charge. In the case of MIDH as well, various necessary steps have been taken to develop human resources both officials and farmers of the state. The fund utilized against each activity for Human Resource Development under the scheme are as below:

a)	Training of farmer (within the state)	Rs. 270 Lakhs
b)	Training of farmers (outside the state)	Rs.107 Lakhs
c)	Exposure visit of farmers (outside the country)	Rs. 56 Lakhs
d)	Training/Study tour of technical staff/field staff (within the state)	Rs 49.26 Lakhs
e)	Study tour of technical staff/field staff to progressive states.	Rs.177 Lakhs
f)	Training/Study tour of technical staff/field staff (Outside India)	Rs. 186 Lakhs
g)	HRD for Gardener/Skill Development	Rs. 81 Lakhs



15. **Integrated Post Harvest Management:** Post harvest management has been one of the most challenging tasks in both agriculture and horticulture. Once crops are harvested, some need further treatments before reaching the consumers. This is necessary for maintaining value, value addition, availability of supplies during the off season, etc., since most horticulture crops are highly perishable if left untreated. So far, more than Rs. 1678 lakhs have been spent to undertake the following activities under the component -Integrated Post Harvest Management.

- a) Construction of 169 Pack Houses (9mx6m) at the expense of Rupees 338 lakhs.

- b) Construction of 1741 Pusa Zero energy cool chambers (100kg) by spending Rupees 34 lakhs (approx).
- c) Construction of 73 Evaporated/low energy cool chambers (8mt) with the expenditure of more than Rupees 180 lakhs.
- d) Setting up of 10 Integrated Pack Houses with facilities for conveyer belt, sorting, grading units, washing, drying and weighing by spending Rupees 250 lakhs (approx).
- e) Purchase of 13 Refrigerated Vans/Transport vehicles with an expenditure of Rupees 149 lakhs (approx).
- f) Setting up of 25 Cold Rooms (Solar based storage facilities) with an expenditure of Rupees 187.5 lakhs (approx.).
- g) Setting up of 36 Primary Processing Unit (Solar based drier) with an expenditure of Rupees 79 lakhs (approx).
- h) 399 Ripening Chambers with an expenditure of Rupees 199 lakhs (approx).

**16. Mission Management:** Efficient management is essential for the successful implementation of any scheme whether it is of a Central or State government. Mismanagement may lead to the failure of the scheme even if a huge amount of fund is allocated. To ensure effective and efficient management of the scheme, the following activities have been undertaken under MIDH in Mizoram.

- a) Administrative expenses for State & District Mission Offices and implementing agencies, project preparation, computerization of offices, contingency etc.
- b) Institutional strengthening, hire and purchase of vehicle, purchase of computers.
- c) Seminar, workshops, exhibitions, Kisan Mela, Horticulture Show, Honey festival at District, State and National level.
- d) Information dissemination through publicity, literature in a printed form, advertisement etc.
- e) Development of technology packages in electronic form to be shared through IT network.
- f) Baseline survey and strengthening horticultural statistical data base.



**17. Establishment of Market Infrastructure for Horticulture Crops:** MIDH/HMNEH has been formulated and implemented not only to increase productivity and expansion of areas under cultivation alone but improving the economic status of horticulture farmers as well. Thus, establishment of market infrastructure, where farmers can sell off their products, has been an important component of the scheme since the first year of implementation. So far, Rs. 370 lakhs (approx.) has been spent to undertake the following activities-

- a) Purchase of Mobile Vending Cart: 400 vending carts were purchased and distributed to the fruits and vegetables vendors free of cost.
- b) Construction of Rural Market/Apni Mandies/Direct Market: 20 markets were constructed at roadsides, mostly along the national highways in different villages where rural farmers can sell their produces.
- c) Retail Outlet: 4 (four) retail outlets were constructed under the scheme where horticulture crops such as fruits, vegetables are sold at retail price.



18. **Research and Development:** This component of work had been carried out in 2015-2016 only. Rs. 23 lakhs were spent for the purpose.
19. **Organic Farming:** Under the scheme, the component - Organic Farming was carried out in 2015-2016 only. For this purpose, Rs. 12 lakhs were spent to set up 25 Vermicomposting units.
20. **Special Intervention:** Under this component of the scheme, some portion of fund was reserved for emergent and unforeseen circumstances. However, this component of the scheme was carried out in 2014-2015 and 2018-2019 only with an expenditure of Rs. 120 lakhs.
21. **Formation of Farmer Interest Groups (FIGs)/Farmer Producer Organisations (FPOs):** As the need for formation of FIGs and FPOs in the guidelines of the scheme was highlighted, the Department took initiatives to set up societies/associations for the smooth implementation of the scheme and to ensure the welfare of the farmers. Mizoram Dragon Fruit Association, Mizoram Anthurium Growers Association at village, district and state level etc., are important associations formed with the assistance received under the scheme. These associations have been playing many important roles for promoting the welfare of their members since their formation. The cooperation and collaboration with the Department has contributed to the promotion of horticulture within the state.

## RESULTS AND DISCUSSION

As mentioned in the above various schemes have been implemented in Mizoram for the development of horticulture. Even during the time when Horticulture was a Wing under the umbrella of the Department of Agriculture many horticultural development activities were carried out for uplifting horticulture farmers and increasing horticultural produces thereby contributing to the economy of the state. These horticultural activities of the government, whether Centrally Sponsored Schemes or State Schemes, seemed to have had numerous positive results on many aspects of the lives of the people especially that of the horticulture farmers. As a result, most of the people in the rural areas and some in urban areas have taken up horticulture as a means of livelihood or at least as a source additional income.

In this paper an attempt has been made to find out socio-economic profile of the beneficiaries, different aspects of the implementation of the schemes including problems and issues, impact of the schemes, future-plan of the beneficiaries and implementing agency with and without the schemes, etc. To conduct this research, Kolasib districts is selected as sample districts. Regarding the number of respondents under MIDH, 57 farmer respondents and 8 official respondents were selected.

Among the various horticulture schemes/programme, Mission for Integrated Development of Horticulture (MIDH) formerly known as Horticulture Mission for Northeast and Himalayas (HMNEH) has been one of the most important schemes in Mizoram in terms of area coverage and fund allocation. MIDH has been formulated and implemented to cover all districts in the state. So far, more than 80 thousand hectares of land has been covered by different activities under MIDH by spending 26 thousand lakhs rupees (approx). However, it may be brought to light here that the area coverage often encompasses the same area for consecutive years due to repetitive funding of the same beneficiaries under some components of the scheme such as Integrated Pest/Nutrient Management, Rejuvenation/Replacement of Senile Plantation, Canopy Management etc. There are number of important factors which is used to study horticulture management in the Kolasib District, but it is not possible to mention all the factor in one paper. This paper will cover Land Ownership, Assistance to beneficiaries, membership in farmers' interest group (FIG), Participation in training under the scheme, extension services to get the result.

### Land Ownership

The below Table depicts the land ownership status of the respondents. Out of the total of 57 respondents 36 (63.15 %) possesses the land on which they are undertaking the scheme while 21 (36.84 %) respondents are

working on land owned by others. It may be highlighted here that respondents working on land owned by others do so free of cost. Such lands are mostly owned by other beneficiaries who possess larger expanses of land, to enable the clustering of beneficiaries.

### Land Ownership Status of the Respondents under MIDH

SN	District	Crop/Trade	Owned	Rented	Total
1	Kolasib	Fruits	15	-	15
		Vegetables	12	-	12
		Flower	12	-	12
		Infrastructure	15	3	18
4	Grand Total		54	3	57
5	Percentage		27.7	5.26	100

It is found that Kolasib district has got the highest number of land owners at 54 while those who were undertaking their activity on rented were only 3, all of them being a part of the infrastructure component.

Among the respondents who undertake their horticulture activity on their own land under the scheme, the maximum number are those involved in fruit and infrastructure component at 15 each respondents constituting 26.31 percent, 12 with vegetables and Flowers constituting 21.05 %.

Regarding the number of respondents depending on rented land in the districts, there are 15 respondents with infrastructure constituting 26.31 percent and 12 respondents with vegetable who constituted 21.05 percent of the total while those with fruit and flower component are all found to be working on their own land. Out of the 45 respondents in infrastructure component, which comprises of construction of greenhouse, there are 15 respondents working on the land of others constituting 26.31 percent of those involved in the component.

### Assistance to Beneficiaries

The table below reflects whether respondents received assistance in cash or kind. 12 (21.05 percent) respondents received assistance in cash only while 21 (36.84 percent) received assistance in kind only. 24 (42.10 percent) received assistance both in cash and kind. Regarding the number of respondents receiving assistance in cash only, respondents with infrastructure constituted 10.52 percent being the highest followed by fruit and vegetable constituting 5.26 percent, the respondents of Flower components do not receive any cash and kind among the total respondents.

In respect of the number of respondents who received assistance in kind only, fruits and vegetable comprise 5.26 percent of the respondents, infrastructure 10.52 percent of the total respondents. Out of the 57 respondents who receive assistance both in cash and in kind, fruit constituted 21.05 percent, infrastructure 21.05 percent. Among the 57 respondents in Kolasib district, 12 respondents which is 21.5 percent received assistance in cash only while 36.84 received in kind only and 42.10 percent were assisted in both cash and kind.

### Assistance Received in Cash or Kind

SN	District	Crop/Trade	In Cash	In Kind	Both	Total
1	Kolasib	Fruits	3		12	15
		Vegetables	3	9		12
		Flower		12		12
		Infrastructure	6		12	18
4	Grand Total		12	21	24	57
5	Percentage		21.5	36.84	42.10	100

Below Table is about the number of instalments received by respondents. 12 respondents which accounts for 21.05 percent received assistance thrice or more while 15 respondents received up to second instalment constituting 26.31 percent only, and 12 respondents received only first instalment accounting 21.05 percent.

In Kolasib district, 27 respondents (47.37 percent) received assistance as one time assistance, another 47.37 percent received two instalments and 5.26 percent received three times or more.

**Table showing Assistance Received**

SN	District	Crop/Trade	1 Instalment	2 instalments	3 or more instalments
1	Kolasib	Fruit	3	12	
		Vegetable	12		
		Flower	3	6	3
		Infrastructure	9	9	
4	<i>Total</i>		27	27	3
5	<i>Percentage</i>		47.36	47.36	5.26

Among the fruit respondents, 31.25 percent respondents received one instalment, 62.5 percent received two instalments and 6.25 percent received three or more instalments. Regarding the number of respondents with vegetable, 64.29 percent of the total respondent received assistance once, 21.43 percent twice, 14.3 percent three times or more. Among the respondents with flower 25 percent received assistance only once, another 25 percent twice and 50 percent trice or more. In respect of the respondents with infrastructure, 46.67 percent received assistance once, another 40 percent twice and 13.33 percent received trice or more.

**Table showing Timely Receipt of Assistance**

SN	District	Crop/Trade	Yes	No
1.	Kolasib	Fruit	15	
		Vegetable	12	
		Flower	12	
		Infrastructure	18	
4.	<i>Total</i>		57	
5.	<i>Percentage</i>		100	

The above table reveals whether respondents received assistance on time. 100 percent could receive assistance on time without any delay In Kolasib district all respondents could receive assistance on time.

With regards to the respondents with vegetable, 15 (26.31 percent) received assistance on time. All respondents, that is, 24 involved in vegetables and flowers component received assistance on time. In respect of the respondents with infrastructure, 18 (31.57 percent) of the respondents could get assistance on time.

**Membership in Farmers' Interest Group (FIG)****Table showing Membership in FIG**

Sl. No.	District	Crop/Trade	Yes	No
1.	Kolasib	Fruit	15	
		Vegetable	6	6
		Flower	12	
		Infrastructure	3	15
4.	<i>Total</i>		36	21
5.	<i>Percentage</i>		63.15	36.84

The above table shows respondents' membership in any association or society related to their horticulture activities. 63.15 percent are registered in one or more associations related to their horticulture activities while 36.84 percent do not have membership in any related association. In Kolasib district, 63.16 percent are members of their activity related association whereas 36.84 percent does not belong to any association.

In relation to the components among the respondents with fruit, 26.31 percent are members of their activity related association/society. Among the vegetable respondents, 50 percent are members of related association while the remaining 50 percent are not. Regarding flower respondents, 100 percent of the respondents are with related association being the only component with all respondents having membership. Among the respondents with infrastructure, 5.26 percent are members of associations related to their horticulture activity whereas 26.31 percent are without any membership.

## Participation in Trainings under the Scheme

Table showing Whether attended Training (s)?

Sl.No	District	Crop/Trade	Yes	No
1	Kolasib	Fruit	15	
		Vegetable	9	3
		Flower	12	
		Infrastructure	18	
4	Total		54	3
5	Percentage		94.73	5.26

The above Table highlights whether the respondents attended training (s) organised for their activity under the scheme. 94.73 percent attended one or more trainings whereas 5.26 percent did not attend any. In Kolasib district, 94.74 percent attended at least one training and 5.26 percent did not.

Among the fruit respondents, 100 percent attended training. Regarding vegetables, 75 percent attended training and 25 percent have not attended. In respect to respondents with flower, all have successfully undergone at least one training. Among the respondents with infrastructure, all respondents had undergone training.

Table showing Is/Are Training (s) Helpful?

Sl.No	District	Crop/Trade	Yes	No	No Opinion
1	Kolasib	Fruit	12		3
		Vegetable	9		
		Flower	12		
		Infrastructure	18		
4	Total		51		3
5	Percentage		89.47		5.26

As shown in the above table 89.47 percent have found the training(s) attended by them helpful in the course of their work whereas 5.26 percent are those without any opinion on the utility of the trainings. A number of those cited that several of the skills and processes imparted during training were difficult to practice on farm.

In Kolasib district, 89.47 percent thought that the training organised under the scheme are helping them in their activities whereas 5.26 percent perceived the training as neither positive nor negative in its impact.

Regarding the number of respondents under the fruit component, 80 percent agreed that trainings were helpful in their course of work whereas 20 percent do not have an opinion on the usefulness of the trainings. Among the respondents with vegetables who attended training, all (100 percent) respondents thought that trainings helped them and there is no single respondent who has opposite opinion. In respect of the number of respondents among the flower grower under the scheme, 100 percent cited having gained skills and knowledge from their training. Among the respondents with infrastructure, 100 percent agreed that the training augmented their performance.

## Extension Services

Technical/extension guidance from the concerned department was received by 90.57 percent of the respondents in the course of their work whereas 9.43 percent did not receive any guidance.

Table showing Whether received technical/extension Guidance?

Sl.No	District	Crop/Trade	Yes	No
1	Kolasib	Fruit	9	6
		Vegetable	12	
		Flower	12	
		Infrastructure	15	3
4	Total		48	9
5	Percentage		84.21	15.79

Among the respondents in Kolasib district, 84.21 percent received guidance from the concerned department whereas 15.79 percent carried out their activities without any guidance.

Of the respondents with fruit, 60 percent were given guidance from the department more than once while 40 percent did not receive any guidance or supervision. In respect of the number of respondents with vegetables as well as those with flowers, 100 percent received guidance from the department and there is not a single respondent who worked without any guidance. Regarding the respondents under infrastructure, 83.33 percent received guidance or supervision whereas 16.67 percent of them worked on their own.

### Inspection and Monitoring by the Department

Below table enumerates the number of respondents who received inspection and monitoring from the department to make sure that assistances rendered were utilized as stipulated in the scheme. 84.21 percent of respondents were inspected and monitored by the department whereas 15.79 percent were not.

In Kolasib district, 84.21 percent of respondents were inspected and monitored to see utilization of the assistance received whereas 15.79 percent did not witness any inspection and monitoring activities.

Regarding the number of inspected respondents, 60 percent respondents from fruit, 100 percent respondents from vegetable component and flower component, 83.33 percent respondents from infrastructure were inspected by the department at least once or more whereas the department neither monitored nor inspected 40 percent and 16.67 percent from fruit and infrastructure respectively.

**Table showing Inspection and Monitoring**

Sl.No	District	Crop/Trade	Yes	No
1	Kolasib	Fruit	9	6
		Vegetable	12	
		Flower	12	
		Infrastructure	15	3
4	Total		48	9
5	Percentage		84.21	15.78

Inspection and monitoring were conducted with all respondents in the vegetable and flower trade in Kolasib district. 83.33 percent of the respondents involved in infrastructure and 60 percent of those in fruit were inspected and monitored during implementation.

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