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SEMINAR REPORT II  
ON

**Mission for Integrated Development of Horticulture**

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SEMINAR TEACHERS

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## I. INTRODUCTION

In recent years, the horticulture sector has made remarkable progress in terms of crop area expansion, productivity increase, crop diversification, technological interventions for production, post-harvest management, and forward linkages through value addition and marketing, and horticulture has become one of the driving forces of overall agriculture development in India. It has emerged as a promising source of income growth, job creation, poverty alleviation, and export promotion.

Indian horticulture sector contributes 33 per cent share of total value of output in agriculture sector making very significant contribution to the Indian economy. Area, production, productivity of horticulture produce in India is 27.6 million hectares, 333.3 million tonnes and 12.1 million tonnes/ ha respectively during 2021-22 (First advance estimate). India is the second largest producer of fruits and vegetables in the world after China. Major producing states of horticultural crops in India are Uttar Pradesh, West Bengal, Madhya Pradesh, Maharashtra, Andhra Pradesh, Gujarat, Bihar, Karnataka, Tamilnadu, Odisha. Karnataka has high potential for horticultural crops and state ranks fourth in area under horticultural crops. Horticulture generates 40 per cent of the total income of the state (Kumar, 2018).

India's share in the world production of fruits is 11.38 per cent and vegetables is 11.78 per cent. India stands first in production of mango, banana, guava, papaya, lemon & lime, okra in the world and stands second in the production of potato, tomato, onion, cabbage, cauliflower and brinjal in the world.

Major fruit growing states in the country are Andhra Pradesh, Maharashtra, Gujarat, Tamil Nadu and north eastern and hill states and major vegetable growing states are Uttar Pradesh followed by West Bengal and Madhya Pradesh. The area under fruit crops during 2019-20 is 6.70 Million Hectares, with a total production of 100.45 Million Tonnes. During the period 2009-10 to 2019-20, production of fruits increased by about 40.46 per cent, while the area increased by about 6 per cent.

Vegetables are an important crop in the horticulture sector, occupying an area of 10.32 Million Hectare as per 2019-20 (3rd Advance Estimates) with a total production of 189.46 Million

Tonnes with average productivity of 18.4 Tonnes /Hectare (Anon., 2021). In fact, vegetables constitute about 59.3 per cent of horticulture production. During the period 2009-10 to 2019-20 area and production of vegetables increased by 29.2 per cent and 41.7 per cent, respectively.

India has made remarkable advancements in production of flowers, Flowers in the horticulture sector, occupying an area of 0.327 Million Hectare as per 2019-20 (3rd Advance Estimates) with a total loose flower production of 2.323 Million Tonnes with average productivity of 7.10 Tonnes/Hectare. During the period 2009-10 to 2019-20, production of loose flowers increased by about 56.09 per cent and production of cut flowers increased by only 2.3 per cent, while the area increased by about 41.89 per cent.

With growing rural population in horticultural sector, Government of India supported the growers by implementing central, state, district schemes and programmes and also created awareness about the horticultural plans, programmes, mission objectives, targets and strategies to provide excellent opportunities for raising the income, employment and living standards of farmers.

## **II. Objectives**

1. To know the concept of mission for integrated development of horticulture
2. To know the interventions of mission for integrated development of horticulture
3. To review related research studies.

## **III. Historical Perspective of MIDH**

### **1. Coconut Development Board (CDB)**

Coconut Development Board (CDB) is a statutory body established under the Ministry of Agriculture and Farmers Welfare, Government of India for the integrated development of coconut cultivation and industry in the country with focus on productivity increase and product diversification. The Board which came into existence on 12th January 1981, functions under the administrative control of the Ministry of Agriculture and Farmers Welfare, Government of India, with its Headquarters at Kochi in Kerala and Regional Offices at Bangalore in Karnataka, Chennai in Tamil Nadu, Guwahati in Assam and Patna in Bihar. There are five State Centres situated at

Pitapally in Odissa, Kolkata in West Bengal, Thane in Maharashtra, Vijayawada in Andhra Pradesh and Port Blair in the Union Territory of Andaman & Nicobar Islands. The Board has 12 Demonstration cum Seed Production (DSP) Farms in different locations of the country and now 10 farms are maintained. A Market Development cum Information Centre has established in Delhi. The Board has set up a Technology Development Centre at Vazhakulam near Aluva in Kerala and a Field office at Thiruvananthapuram in Kerala.

- ❖ Area of operation- all states and UT's where coconut is grown

### **Programmes of the board**

- a) Production and Distribution of Quality Planting Materials
- b) Expansion of Area under Coconut.
- c) Integrated Farming for productivity improvement.
- d) Technology Demonstration/Quality Testing Lab.
- e) Replanting and Rejuvenation of Old Coconut Garden
- f) Establishment of in House Research & Development Centre.

### **g) Technology Mission on Coconut**

The Scheme Technology Mission on Coconut (TMOC) was sanctioned during the financial year 2001-02 with the objectives of (a) the development of new value added coconut products and by-products by research, bring these value added product to commercial production by assistance to promising entrepreneurs adopting these technologies, (b) providing assistance for the controlling of specific disease/pest in any specific area including development of technology for controlling of such diseases/pests to ensure uninterrupted supply of raw materials to the coconut industry for the production of value added products and by-products (c) develop and promote market for such newly developed values added products and by-products including traditional products (ball copra, copra and oil) by research, surveys and brand promotion. The implementation of this scheme is on time bound project basis.

- ❖ TMOC scheme provides financial assistance to entrepreneurs/farmers for setting up of coconut based industries (other than coir based industries).
- ❖ TMOC scheme mainly focuses on Research and Development on Post-Harvest Processing, Product diversification, Value addition and management of pest and diseases to support coconut cultivation and industry.
- ❖ Through this scheme, CDB provides assistance to Research institutes for development and demonstration of technologies in the fields of processing and product diversification & management of pest and diseases.

#### **h) Coconut Palm Insurance Scheme**

Coconut Palm Insurance Scheme (CPIS) is being implemented with the objective of insuring coconut palms against natural calamities, climatic risks, pests, diseases and other perils. Under this scheme, all healthy nut bearing coconut palms in the age group from 4 years to 60 years in a contiguous area (Mono / mixed) can be insured against natural perils leading to death/ loss of palm /becoming unproductive. 50 per cent of the premium is borne by the Board and balance is shared between the State Government and Farmers @ 25 per cent each, as below. Insurance is for individual palms and not area based. Partial insurance of plantation is not allowed. Minimum 5 healthy nut bearing palms is the criterion to come under the insurance scheme. The scheme is being implemented in all coconut growing States through Agriculture Insurance Company and implementing State Governments.

Age group of Palms	Premium (Rs.)	Board's share (Rs.) (50%)	State Govt. Share (Rs.) (25%)	Farmer's share (Rs.) (25%)	Sum Assured (Rs.)
4-15 years	9.00	4.50	2.25	2.25	900/-
16-60 years	14.00	7.00	3.50	3.50	1,750/-

#### **i) Kerasuraksha Insurance scheme**

The Kera Suraksha Insurance scheme for Coconut Tree Climbers (CTC)/Neera Technicians/Coconut Harvesters is being implemented in association with M/s Oriental Insurance Company Ltd. The scheme is implemented in all coconut growing States. The provisions under the scheme have been modified from 01.11.2020 with increased benefits under all the components of the policy. The sum assured revised under the policy is Rs.5.00 lakhs against 24 hours accident related risk including death. Annual premium under the policy is Rs.398.65/-, out of which Board's share of premium is Rs.299.65 and balance Rs.99/- is the beneficiary's share. Beneficiary has the option of paying his/her share of premium of Rs.99/- through DD or online mode.

## **2. National Horticulture Board (NHB)**

The National Horticulture Board (NHB) was set up by the Government of India in 1984 as an Autonomous organization under the administrative control of Ministry of Agriculture and Farmers Welfare and registered as a society under Societies Registration Act with its headquarters at Gurugram. Presently, NHB has 29 field offices located all over the country. The broad aims and objectives of the Board are to develop production clusters/hubs for integrated Hi-tech commercial horticulture, development of Post-harvest and cold chain infrastructure, ensuring availability of quality planting material and to promote adoption of new technologies/tools/ techniques for Hi-tech commercial horticulture *etc.*

- ✓ Area of operation-All states & UTs focusing on commercial horticulture

### **Aims & Objectives of NHB Schemes**

The main objectives of the NHB are to improve integrated development of Horticulture industry and to help in coordinating, sustaining the production and processing of fruits and vegetables.

Detailed objectives of the Board are as under:-

1. Development of hi-tech commercial horticulture in identified belts and make such areas vibrant with horticultural activity, which in turn will act as hubs for development of horticulture.
2. Development of modern post-harvest management infrastructure as an integral part of area expansion projects or as common facility for cluster of projects.
3. Development of integrated, energy efficient cold chain infrastructure for fresh horticulture produce.

4. Popularization of identified new technologies / tools / techniques for commercialization / adoption, after carrying out technology and need assessment.
5. Assistance in securing availability of quality planting material by promoting setting up of scion and root stock banks / mother plant nurseries and carrying out accreditation / rating of horticulture nurseries and need based imports of planting material.
6. Promotion and market development of fresh horticulture produce.
7. Promotion of field trials of newly developed/imported planting materials and other farm inputs; production technology; PHM protocols, INM and IPM protocols and promotion of applied R&D programmes for commercialization of proven technology.
8. Promotion of Farm Mechanization in Horticulture through demonstration and its uses at farmers field level to reduce labour cost and increase the productivity of Horticulture crops.
9. Promotion of applied R & D for standardizing PHM protocols, prescribing critical storage conditions for fresh horticulture produce, bench marking of technical standards for cold chain infrastructure etc.
10. Transfer of technology to producers/farmers and service providers such as gardeners, nurserymen, farm level skilled workers, operators in cold storages, work force carrying out post harvest management including processing of fresh horticulture produce and to the master trainers.
11. Promotion of consumption of horticulture produce and products.
12. Promoting long distance transport solution for bulk movement of horticulture produce through rail etc.
13. Carrying out studies and surveys to identify constraints and develop short and long term strategies for systematic development of horticulture and providing technical services including advisory and consultancy services.

### **3. Horticulture Mission for North East and Himalayan states (HMNEH)**

In order to improve livelihood opportunities and to bring prosperity to the North Eastern Region (NER) including Sikkim, Government of India launched a Technology Mission for North East for integrated Development of Horticulture in 2001-02. Considering the potential of Horticulture for socio-economic development of Jammu & Kashmir, Himachal Pradesh and Uttarakhand, Technology Mission was extended to these States from 2003-04. With effect from

2014-15, HMNEH scheme has been subsumed under Mission for Integrated Development of Horticulture (MIDH). HMNEH is based on the “end-to-end approach” taking into account the entire gamut of horticulture development, with all backward and forward linkages, in a holistic manner.

### **Goals & Objectives of the Horticulture Mission**

1. To improve the production and productivity of horticulture crops by harnessing the potential of the region.
2. Special emphasis on “Low Volume, High Value, Less Perishable Horticulture Crops”.
3. A horticulture based farming system to be developed, thereby providing viable and ample opportunities for employment, especially for women, besides improving productivity of land.

**The programmes under the HMNEH have been evolved in consultation with all the stakeholders, including the State Governments. The HMNEH strives to address the following issues:**

- ❖ Technology & technological development
- ❖ Demonstration of technologies
- ❖ Production of quality planting material
- ❖ Organic farming
- ❖ Efficient water management
- ❖ Post-Harvest Management
- ❖ Marketing

The NER is known for minimum use of chemical fertilizers and pesticides. This is proposed to be converted into a strength through appropriate technology-based development and adoption of organic management of horticulture development activities.

### **4. National Horticulture Mission (NHM)**

NHM was launched in 2005-06. It covers all states and union territories except north eastern states

## Objectives

- ❖ To provide holistic growth of the Horticulture sector
- ❖ To enhance horticulture production
- ❖ To promote, develop and disseminate technologies
- ❖ To create employment opportunities

## STRATEGY

- Promote R&D technologies for production, post harvest management and processing.
- Enhance acreage, coverage and productivity
- Assist setting up post harvest facilities.
- Promote co-ordination and partnership between public and private sector.
- Promote capacity building and HRD.

## 5. Central Institute of Horticulture (CIH)

Central Institute of horticulture was established in the year 2006. It is located at Mediziphema, Nagaland. It covers all north eastern states

### Vision

- To emerge as the pioneering, innovative, farmer focused and self-supporting horticultural institute in the country.

### Mission

- To provide excellent, innovative and relevant training to all stakeholders so as to empower individuals and enable horticulture industry to bring socio-economic development in North East Region.

### Objectives of CIH

1. Capacity building
2. Demonstration

3. Promotion of organic cultivation
4. Establishing convergence and synergy
5. Follow-on extension support

#### **IV. Concept of mission for integrated development of horticulture**

Mission for Integrated Development of Horticulture (MIDH) is a Centrally Sponsored Scheme for the holistic growth of the horticulture sector covering fruits, vegetables, root & tuber crops, mushrooms, spices, flowers, aromatic plants, coconut, cashew, cocoa and bamboo. Under MIDH, Government of India (GOI) contributes 60%, of total outlay for developmental programmes in all the states except states in North East and Himalayas, 40% share is contributed by State Governments. In the case of North Eastern States and Himalayan States, GOI contributes 90%. MIDH will work closely with National Mission on Sustainable Agriculture (NMSA) to wards development of Micro-Irrigation for all horticulture crops and protected cultivation on farmers' field. MIDH will also provide technical advice and administrative support to State Governments/ State Horticulture Missions (SHMs) for the Saffron Mission and other horticulture related activities like Vegetable Initiative for Urban Clusters (VIUC), funded by Rashtriya Krishi Vikas Yojana (RKVY)/NMSA.

#### **MISSION OBJECTIVES**

1. Promote holistic growth of horticulture sector, including bamboo and coconut through area based regionally differentiated strategies, which includes research, technology promotion, extension, post-harvest management, processing and marketing, in consonance with comparative advantage of each State/region and its diverse agro-climatic features;
2. Encourage aggregation of farmers into farmer groups like FIGs/FPOs and FPCs to bring economy of scale and scope.
3. Enhance horticulture production, augment farmers, income and strengthen nutritional security;
4. Improve productivity by way of quality germplasm, planting material and water use efficiency through Micro Irrigation.
5. Support skill development and create employment generation opportunities for rural youth in horticulture and post-harvest management, especially in the cold chain sector.

## **Strategy**

To achieve above objectives, the mission will adopt the following strategies:

- a) Adopt an end-to-end holistic approach covering pre-production, production, post-harvest management, processing and marketing to assure appropriate returns to growers/producers;
- b) Promote R&D technologies for cultivation, production, post-harvest management and processing with special focus on cold chain infrastructure for extending the shelf life of perishables;
- c) Improve productivity by way of quality through:
  - i. Diversification, from traditional crops to plantations, orchards, vineyards, flowers, vegetable gardens and bamboo plantations.
  - ii. Extension of appropriate technology to farmers for high-tech horticulture including protected cultivation and precision farming.
  - iii. Increase of acreage of orchards and plantation crops including bamboo and coconut, particularly in states where total area under horticulture is less than 50% of agricultural area.
- d) Improve post-harvest management, processing for value addition and marketing infrastructure.
- e) Adopt a coordinated approach and promote partnership, convergence and synergy among R&D, processing and marketing agencies in public as well as private sectors, at the national, regional, state and sub-state levels;
- f) Promote FPOs and their tie up with Market Aggregators (MAs) and Financial Institutions (FIs) to support and adequate returns to farmers.
- g) Support capacity-building and Human Resource Development at all levels, including, change in syllabus and curriculum of graduation courses at Colleges, Universities, ITIs, Polytechnics, as appropriate.

## **Mission Structure**

The Mission will have a General Council (GC) at National level under Chairmanship of Union Agriculture Minister. GC will be the formulation body giving overall direction and guidance

to Mission, monitor and review its progress and performance. Without affecting the approved programmes, cost norms and pattern of assistance as approved by CCEA, GC will be empowered to lay down and amend operational guidelines. GC will meet at least twice a year. Tenure of non-official members of GC will be for three years from the date of nomination.

EC is empowered to reallocate resources across States and components and approve projects on the basis of approved subsidy norms. EC is also empowered to approve special interventions for tackling emergent/ unforeseen requirements. EC can also constitute Empowered Monitoring Committee (EMC)/Sub-Committee (SC) and delegate powers to EMC/ SC/Mission Director, as well as to State Governments / State Horticulture Missions / State Bamboo Development Agencies (SBDA) for approving projects in accordance with approved cost norms and pattern of assistance. Tenure of the experts will be for three years from the date of nomination. Horticulture Division in DAC will provide the necessary support to GC/EC/EMC and will administer NHM, HMNEH, NBM and CIH Scheme. Managing Director (NHB) will oversee the programmes of NHB while Chairman, CDB will oversee the CDB programmes. The existing structure of the Boards and Missions will be maintained to provide general direction for these programmes. EC/EMC will ensure smooth functional linkages among different agencies and meet as frequently, as required.

### **State Level Executive Committee**

For NHM, HMNEH and NBM, State Level Executive Committee(s) (SLEC) under Chairmanship of Agricultural Production Commissioner or Principal Secretary Horticulture/Agriculture/Environment & Forests, (in the absence of APC) having representatives from other concerned Departments of State Government including Forests, the State Agricultural Universities (SAU), Institutes under Indian Council of Agricultural Research (ICAR), Growers' Associations/FPOs, *etc.*, will oversee the implementation of programmes of the respective States. Central Government will nominate its representative to the SLEC. State Mission Director NHM, HMNEH and NBM will be Member Secretary of the concerned SLEC. At operational level, State Governments will have freedom to establish State Horticulture Mission (SHM) and/ or SBDA as a suitable autonomous agency, to be registered under Societies Registration Act for implementing

Mission programmes at State and District levels. Panchayat Raj Institutions (PRI) existing in the State will be involved in the implementation of the programme.

### **District level**

At District level, District Mission Committee (DMC) will be responsible for carrying forward the objectives of the Mission for project formulation, implementation and monitoring. The DMC may be headed by the Chief Executive Officer (CEO) of Zila Parishad/CEO of District Rural Development Agency (DRDA)/CEO of Forest Development Agencies (FDA)/ District Development Officer, having as members, representatives from concerned line Departments, growers' associations, Marketing Boards, local banks, Self Help Groups and other Non-Governmental organizations. In the case of HMNEH States, Deputy Commissioner/ District Collector could function as Chairman of DMC. District Horticulture Officer/District Agriculture Officer will be Member Secretary of DMC.

### **Panchayat Raj Institutions**

District Planning Committee and Panchayat Raj Institutions (PRI) will be involved in implementing the programme commensurate with their expertise and available infrastructure. They will have a role in implementation of MIDH with regard to: -

- a) Identification of crops/species and beneficiaries in consultation with District Panchayats.
- b) Training, Extension and Awareness creation through Panchayats and Gram Sabha's (GS).
- c) Organization of PRI and GS meetings and giving feed back to the concerned officials with regard to implementation of MIDH.

### **V. Fund flow mechanism**

Flow of funds and the utilization by the Implementing Agencies / SHMs / SBDA/ NLAs / PRIs *etc.*, from Government of India and utilization of funds shall be governed by extant financial norms. Funds will be released to the State Governments. State Government will release funds to the SHMs / State Level Implementing Agencies, who in turn would make funds available to DMC/ District Implementing Agency. As far as possible, efforts to make on-line payment to all

Implementing Agencies would be ensured, which in turn will make arrangements for making payment to beneficiaries through electronic transfer, preferably to their respective bank accounts.

Flow chart for release of funds under MIDH is given below

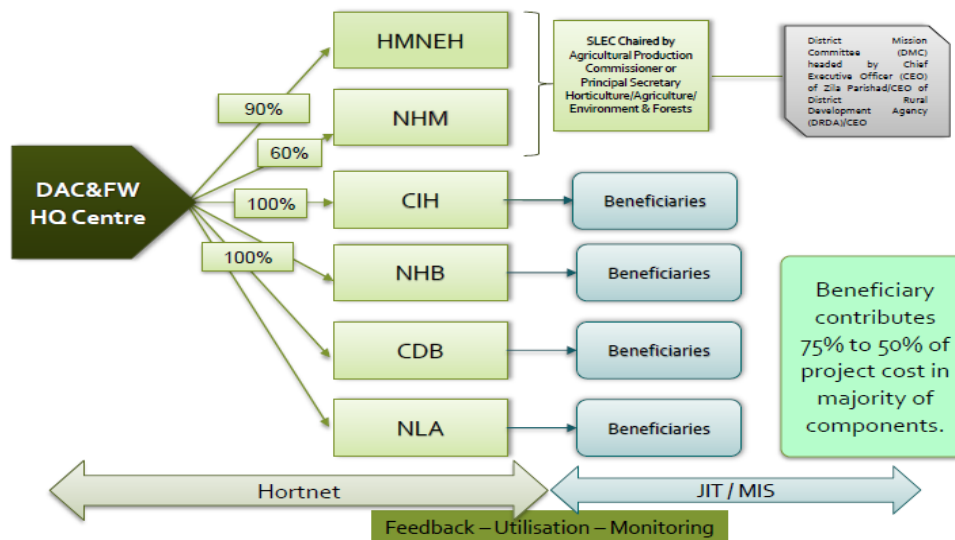


Fig 1. Fund flow mechanism

## VI. Mission Interventions

The Mission will be demand and need based in each segment. Technology will play an important role in different interventions. Technologies such as Information Communication Technology (ICT), Remote Sensing and Geographic Information System will be widely used for planning and monitoring purposes including identification of sites for creating infrastructure facilities for post-harvest management, markets and production forecasts. The interventions envisaged for achieving desired goals would be varied and regionally differentiated with focus on potential crops to be developed in clusters by deploying modern and hi-tech interventions, duly ensuring backward and forward linkages.

### 1. Research & Development (R & D)

Programmes on horticulture and bamboo R & D will be based on applied research in the areas of (i) Seed & Planting material, including import of planting material, (ii) Technology standardization, (iii) Technology acquisition and (iv) imparting training & Front Line Demonstration in a project mode. While R&D on horticulture crops will be confined to NE &

Himalayan states, R&D on Bamboo will be on pan India basis. Research Institutes under Indian Council of Agricultural Research (ICAR), Council of Scientific & Industrial Research (CSIR), Indian Council of Forestry Research & Education (ICFRE) and its institutes, State Forest Research Institutes, State Agricultural Universities and other Research institutes/organizations in the Public sector will be eligible for assistance in R&D. Project proposals, in this regard, will be submitted through the State Horticulture Mission/ State Horticulture Department. In case of Bamboo R & D projects are to be submitted to NBM directly and research programme should be guided by the Working Group on R & D. Projects will be approved by the EC/EMC. Rs. 100 lakh / project allocated under this intervention.

## **2. PRODUCTION AND PRODUCTIVITY IMPROVEMENT**

The Mission will focus primarily on increasing both production and productivity through adoption of improved and appropriate technologies for ensuring quality, including genetic upgradation of all horticultural crops and addressing challenges of climate change. Special emphasis will also be given for adoption of area based cluster approach towards developing regionally differentiated crops, which are agro-climatically most suitable for the State/region. Cluster approach will also help in aggregation of farmers into FPOs/FPCs. Availability of good quality planting material will receive focused attention. Efforts will also be made to establish and upgrade nurseries and TC Units. This will be supplemented through plantation development programmes through addition of new areas under improved varieties to meet market demand. **Planting material of seed origin for fruit crops which can be vegetatively propagated will not qualify for subsidy assistance.**

## **3. PRODUCTION & DISTRIBUTION OF PLANTING MATERIAL**

### **Nurseries**

Production and distribution of good quality seeds and planting material will receive top priority. States will have a network of nurseries for producing planting material, which were established through Central or State assistance. To meet the requirement of planting material (for bringing additional area under improved varieties of horticultural crops and for rejuvenation programme for old/senile plantations), assistance will be provided for setting up new hi-tech nurseries and small nurseries under the Public as well as Private sector. Hi-tech nurseries will have

an area between 1 to 4 ha with a capacity to produce 50,000 plants per ha of mandated perennial fruit crops / tree spices / aromatic trees / plantation crops per year. The plants produced will be duly certified for their quality. In case of bamboo, the size of the Hi- Tech nursery will be restricted to 2 ha. The support includes:

- (i) Proper fencing.
- (ii) Scion / Mother block of improved varieties.
- (iii) Root stock block (Rhizome bank in case of bamboo).
- (iv) Net house
- (v) Irrigation facilities
- (vi) Hi-tech green house having insect proof netting on sides and fogging and misting systems.
- (vii) Hardening/maintenance in insect proof net house with light screening properties and sprinkler irrigation system.
- (viii) Pump house to provide sufficient irrigation to the plants and water storage tank to meet at least 2 days requirement.
- (ix) Soil solarization - steam sterilization system with boilers.

Small nurseries with an area of upto 1.00 ha, will have provision for naturally ventilated green houses and net houses. Small nurseries will produce 25,000 plants of the mandated perennial vegetatively propagated fruit plants / tree spices / plantation crops aromatic plants per year, duly certified for its quality. Nurseries will be encouraged to go in for accreditation. Planting material for MIDH will be procured only from accredited nurseries. The AAP would have area expansion target only up to the level of availability of good quality planting material from accredited nurseries. SHM will also ensure that all nurseries set up under MIDH are accredited within period of eighteen months through designated agencies like National Horticulture Board, State Agricultural Universities, ICAR institutes *etc.* Nurseries in the Public and Private sector can avail assistance to upgrade nursery infrastructure to meet accreditation norms. Moreover, NHB will take up projects for setting up mother block and root stock nursery, as well as nursery accreditation with 100 per cent assistance to public sector.

### **Tissue Culture Units**

New Tissue Culture (TC) units will be established and assistance will be provided for rehabilitation/ strengthening of existing TC Units. New TC units will produce 25 lakh plants of the mandated crop for which protocols are available for commercial use, except Date palm. In the event of production of lesser number of plants, cost of lab will be reduced on a pro rata basis (subject to its viability). New TC unit projects for public sector will be sanctioned to only those agencies, which have requisite technical manpower. No recurring expenditure for the manpower and contingencies will be borne under MIDH. Each TC unit would get itself accredited as per standards and norms of Department of Bio Technology within eighteen months from the date of receiving funds, failing which the assistance provided under the scheme will have to be returned.

### **Vegetable Seed Production**

Estimated cost of vegetable seed production is Rs. 35,000 per ha for open pollinated crops and Rs. 1.50 lakh per ha for hybrid vegetable seeds. Assistance will be provided @ 100 per cent of total cost to public sector. In the case of Private sector, assistance will be 50 per cent of cost as credit linked back ended subsidy. Assistance will be available for a maximum area of 5 ha @ per beneficiary. Production of 'disease-free vegetable seedlings' will be encouraged for hybrid cultivars. Wherever necessary, 'plug technology' and environment control for germination, growth and hardening of vegetable seedlings may be introduced. The infrastructure facilities will include a green house with maximum area of 10,000 sq. meter, including hardening facilities, designed for tropical conditions, with insect netting on sides and rolling poly sheets. The plants will be propagated in plastic trays having small plugs of varying sizes for different crops. Sprinkler irrigation system will be installed. The infrastructure for media sterilization i.e. steam boiler, holding bins, *etc* will also be provided. Total cost will not exceed Rs. 104.00 lakh for a unit with one ha or Rs. 1040 per sq.m. Assistance will be 100 per cent of cost to Public sector and 50 per cent as credit linked back ended subsidy to Private sector.

### **Import of Planting Material**

With a view to procuring best quality planting material of latest varieties of horticultural crops, a component of providing assistance for meeting cost of planting material imported from

abroad has been included. For this, assistance will be provided @ 100 per cent of cost to State Government/ PSUs, under NHM, HMNEH and NHB sub schemes of MIDH.

### **Seed Infrastructure**

To facilitate proper handling, storage and packaging of seeds, assistance will be provided for creating infrastructure like drying platforms, storage bins, packaging unit and related equipment's. Public sector will receive 100 per cent assistance, while assistance to Private sector will be credit linked back ended subsidy @ 50 per cent of cost norms.

### **4. ESTABLISHMENT OF NEW GARDENS**

The Mission envisages coverage of area under improved varieties of horticultural crops like fruits, vegetables, plantation crops and other crops including flowers, spices and aromatic plants. Area expansion will be done in conjunction with Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) under which cost on labour component of work such as digging, fencing *etc* could be met with. Cost of raising new plantations will, however, vary from crop to crop which will be taken into consideration while providing assistance to the beneficiary.

### **5. MUSHROOM PRODUCTION**

In case of mushroom, assistance will be provided for setting up of individual mushroom production, spawn production and compost making units.

### **6. REJUVENATION / REPLACEMENT OF SENILE PLANTATIONS / CANOPY MANAGEMENT**

Rejuvenation programme will address orchards and plantations which have low productivity. It will be implemented through individual farmers, farmers' cooperatives, Self-Help Groups, growers' associations and commodity organizations. Assistance for rejuvenating/replanting senile plantations will be @ 50 per cent of the cost limited to 2 ha per beneficiary. Assistance will be available only in respect of rejuvenating/ replanting senile and unproductive plantations through proven technologies. However, assistance will depend on the nature and requirement of particular crop. Canopy management will address maintenance of tree

architecture as a means for productivity enhancement, particularly for fruit crops and high density plantations. In case of seedling origin, uneconomical orchards will be considered for replanting with improved varieties.

## **7. CREATION OF WATER SOURCES**

Under the Mission, assistance will be provided for creating water sources through construction of community tanks, farm ponds/reservoirs with plastic / RCC lining to ensure lifesaving irrigation to horticulture crops. This will be in conjunction with MNREGS and wherever possible adequate convergence has to be ensured. These water bodies may be linked with Micro Irrigation facility for judicious use of water. Assistance under NHM will be limited to cost of plastic / RCC lining. Lining material should conform to BIS standards. However, where MGNREGS assistance is not available, 100 per cent assistance, including the cost of plastic / RCC lining will be provided. Maintenance of the water source will be the responsibility of the community.

Assistance would also be provided for creating water source through construction of farm ponds/tube wells/ dug wells for individuals. For smaller size of the ponds/tube wells/dug wells, cost will be admissible on prorata basis depending upon the command area. This will also be in conjunction with MGNREGS. However, for non MGNREGS beneficiaries, assistance @ 50 per cent of cost will be provided including the cost of plastic / RCC lining. Lining material should conform to BIS standards. Maintenance of the asset will be the responsibility of beneficiary.

## **8. PROTECTED CULTIVATION**

Activities like construction of green houses, shade net house, plastic mulching, and plastic tunnels, anti-bird/ hail nets would be promoted under the Mission. NHB will implement projects having area above 2500 sq. m. Provision has been made for selecting a variety of construction material for green houses and shade net houses. Preference will be given to using locally available material to minimize cost of construction of such structures. However, for availing/subsidy assistance, all material/technologies should conform to BIS standards.

## **9. PRECISION FARMING DEVELOPMENT AND EXTENSION THROUGH PFDCS**

Existing Precision Farming Development Centres (PFDC) will be involved to develop regionally differentiated technologies for their validation and dissemination. On account of their experience in conducting applied research on plasticulture application, they have expertise in terms of manpower and equipment. PFDCs will be equipped with necessary hardware and software needed for generating information on precision farming techniques on the farmers' field. The ultimate goal is to provide requisite information to farmers so that they are in a position to apply necessary inputs. Other organisations like ICAR Institutes and Institutes in Private sector will also be involved in technology development. For this purpose financial assistance would be provided to PFDCs from MIDH on project basis through the SHMs. PFDCs will take up the activities such as trials, demonstrations for plasticulture and precision farming technologies for horticulture crops, survey to ascertain field adoption of the technology, training of farmers/ officials, display centre, publicity etc. PFDCs will submit annual plan for their activity to SHM with a copy to National Committee on Plasticulture Applications in Agriculture & Horticulture, well in advance.

## **10. PROMOTION OF INTEGRATED NUTRIENT MANAGEMENT (INM) AND INTEGRATED PEST MANAGEMENT (IPM)**

Assistance for Integrated Nutrient Management (INM) and Integrated Pest Management (IPM) measures will be provided for horticultural crops. Assistance will also be available for developing facilities like Disease Forecasting Units (DFUs), Bio Control Labs, Plant Health Clinics and Leaf/Tissue Analysis labs, both under Public and Private sector except for DFUs, which will be only in Public sector. It will be the responsibility of the beneficiary to get the bio control agents registered for commercial sale. Under INM component, subsidy can be availed for use of liquid biofertilizers of N, P and K such as Rhizobium/ Azospirillum/ Azotobactor, Phosphate Solubilising Bacteria (PSB) and Potash Mobilizing Bacteria (KMB), to be applied in combination, in demonstration and other programmes, for which total assistance will be limited to 50 per cent of cost, or Rs. 300.00 per ha., for a maximum area of four ha per beneficiary

## **11. ORGANIC FARMING**

Organic farming in horticulture will be promoted to harness environmental and economic benefits by way of adoption of organic farming techniques along with its certification. For adopting organic farming for perennial and non-perennial fruit crops, vegetables, aromatic plants, spices *etc.*, additional assistance will be given @ 50 per cent of cost over and above the area expansion programme for a maximum area of 4 ha per beneficiary, spread over a period of three years. For organic cultivation of vegetables, assistance will be limited to Rs. 10,000/- per ha spread over a period of three years. Assistance will be used for generating on-farm inputs. NHM will also provide financial assistance for establishing vermi compost units and HDPE Vermibeds @ 50 per cent of cost subject to a maximum of Rs. 50,000/- per beneficiary for a unit having size of 30' x 8' x 2.5'. For smaller units, assistance will be on pro rata basis. For HDPE Vermibed of 96 cft size (12'x4'x2'), the cost will be Rs. 16,000/ per bed and assistance will be limited to 50 per cent of cost. Specification and design parameters of Agro Textiles - HDPE woven beds for vermiculture will conform to BIS standards (IS 15907:2010). Organic certification will be guided by service providers and certification agencies accredited by APEDA.

## **12. GOOD AGRICULTURE PRACTICES (GAP)**

GAP certification has been introduced to encourage farmers to adopt good agricultural practices in line with global GAP, so that farmers are able to get better price for their produce in domestic as well as international market. Assistance for this purpose will be @ 50 per cent of cost for maximum area of four ha per beneficiary. Certification agencies to be involved for this will be as per list approved by APEDA.

## **13. CENTRE OF EXCELLENCE FOR HORTICULTURE**

Centres of Excellence may be established for different horticultural products which will serve as demonstration and training centres as well as source of planting material and vegetable seedlings under protected cultivation.

#### **14. HUMAN RESOURCE DEVELOPMENT (HRD) IN HORTICULTURE**

Under HRD programme, training of farmers, entrepreneurs, field level workers and officers will be taken up. Programme for providing appropriate training to farmers for adoption of high yielding varieties of crops and farming system will be taken up at state level and outside the state. Programme for training of officials concerned with implementation field level workers who will in turn train/guide farmers will also be taken up. Assistance for organizing training courses for Supervisors, Entrepreneurs, Gardeners and Field Functionaries will be continued during XII Plan. Training programme for Supervisors, Entrepreneurs will be organised through selected State Agricultural Universities (SAU), ICAR Institutes, Deemed Universities/Private Universities recognized by UGC having faculty in horticulture and Gardeners training through Krishi Vigyan Kendras and SAUs/ Deemed Universities/Private Universities recognized by UGC recognized by UGC having faculty in horticulture, while departmental staff will be trained under various ongoing training programmes. Training expenses will be met by the Mission.

Minimum qualification for Supervisory & Entrepreneurs training programme would be Higher Secondary and for Gardeners it would be Class-VIII (Middle) standard. Institutions identified for training should have minimum infrastructure facilities including class rooms, staff, hostel facilities *etc.* The courses will be of one-year duration for Supervisors and of six months for Gardeners and of three months for Entrepreneurs. In order to attract the candidates and more importantly retain them and prevent their drop out, a monthly stipend will be provided in form of boarding & lodging charges. These courses will be residential. At the end of the training, Supervisors will be awarded a Diploma in horticulture, while Gardeners and Entrepreneurs will be awarded a Certificate of training in horticulture. At least 25 Supervisors, 50 Gardeners and 25 Entrepreneurs will be trained in each participating institution annually.

In case States wish to organize specialized training courses on horticulture related subjects, assistance will be provided for the same to concerned Institutes directly, based on recommendation of concerned State (s). Such training would generally be of short duration of 7 - 10 days for 20 to 25 participants. Trainers, who are required to train others, can be deputed abroad for training, for which assistance would be made available for meeting the travel cost and course fee. Concerned State Departments of Horticulture/ Agriculture/SHM function as nodal agency for this purpose.

Funds will be made available to SHMs for meeting expenses of candidates involved in implementation of Mission programmes based on their specific proposal.

### **15. POLLINATION SUPPORT THROUGH BEE-KEEPING**

In order to maximize agricultural production, honey-bee can be used as an important input. The responsibility of coordinating the bee-keeping development programme in State will be vested in the identified State Designated Agency (SDA) or any institution/society having capability. National Bee Board (NBB) will be responsible for coordinating beekeeping activity in states. Assistance will be available for activities on development of nucleus stock of honey bees, bee breeding, distribution of honey bee colonies hives and bee keeping equipment's.

### **16. HORTICULTURE MECHANIZATION**

Horticulture mechanization is aimed to improve farm efficiency and reduce drudgery of farm work force. Assistance in this regard will be provided for activities such as procurement of power operated machines & tools, besides import of new machines. Assistance for horticulture mechanization will also be available to such grower associations, farmer groups, Self Help Groups, women farmer groups having at least 10 members, who are engaged in cultivation of horticultural crops, provided balance 60 per cent of the cost of machines and tools is borne by such groups. SHM will enter in to MoU with such association/groups to ensure proper upkeep, running and maintenance of the machines and tools.

### **17. TECHNOLOGY DISSEMINATION THROUGH DEMONSTRATIONS/ FRONT LINE DEMONSTRATION**

Latest technologies will be promoted on crop specific cultivation, use of IPM/INM, protected cultivation, organic farming through farmer participatory demonstration in a compact area of one ha, which will be organized at strategic locations in farmer's field for which assistance will be limited to 75 per cent of cost. For green house cultivation, area will be limited to 500 sq. meter. Farms in public sector, SAUs, Deemed Universities having faculty in horticulture, could be sites for Front Line Demonstrations, for which 100 per cent assistance will be provided, and maximum assistance will not exceed Rs. 25 lakh per project.

## **18. INTEGRATED POST HARVEST MANAGEMENT**

Under post-harvest management, including that for Medicinal plants, activities like handling, grading, pre-conditioning, packaging, transient storage, transportation, distribution, curing and ripening and where possible long term storage can be taken up. Existing schemes of the Directorate of Marketing and Inspection (DMI) and National Cooperative Development Corporation (NCDC) will be leveraged to the extent possible. MIDH would include projects relating to establishment of pre-cooling units, 'on-farm' pack houses, mobile pre-cooling units, staging cold rooms, cold storage units with and without controlled atmosphere capability, integrated cold chain system, supply of refrigerated vans, refrigerated containers, primary/mobile processing units, ripening chambers, evaporative/low energy cool chambers, preservation units, onion storage units and zero energy cool chambers. These projects will be entrepreneur driven and provided credit linked back-ended subsidy. PSUs/Government agencies/ Cooperatives/growers' association recognized/registered by the DMCs, having at least 25 members, will also be entitled to avail assistance for such activities. They may avail back ended subsidy without credit link, subject to condition that they are able to meet their share of the project cost.

## **19. COLD CHAIN INFRASTRUCTURE**

Assistance for setting up of new cold storage infrastructure will be available only to multi-chamber cold storage units with technologies which are energy efficient with provision for thermal insulation, humidity control, advanced cooling systems, automation, etc., having specifications and standards approved by the Ministry. While Cold storages (Long term storage and distribution hubs) up to 5000 MT capacity will be promoted under NHM/HMNEH sub-schemes, capacity above 5000 MT up to 10000 MT will be promoted under NHB sub-scheme. In this context, for cold storages, 3.4 cubic metres (cum.) (120 cubic feet (cft.) of chamber volume shall be considered equivalent to one MT of storage capacity. Similarly, for refrigerated transport, 3 cum (106 cft) of chamber volume shall be equivalent to one MT of storage capacity and for ripening chambers, 11 cum of chamber volume shall be equivalent to one MT of storage capacity. Assistance for pre cooling unit will be linked to pack-houses and cold rooms (staging).

Similarly, assistance for staging cold room will be linked to existing & new pre-coolers. Extant specifications standards and protocols on cold storage and cold-chain components will be

adhered to while approving cold storage projects. Revisions to technical standards and adherence protocols shall be updated by National Centre for Cold-chain Development (NCCD) as necessary when improved technologies and efficiencies are introduced/understood/approved. Assistance can also be availed for a combination of PHM infrastructure components by a beneficiary, within the prescribed norms of individual items. Assistance will be available to individuals, Group of farmers/ growers/ consumers, Partnership/ Proprietary firms, Self Help Groups (SHGs), Farmers Producer Organization (FPOs), Companies, Corporations, Cooperatives, Cooperative Marketing Federations, Local bodies, Agricultural Produce Market Committees (APMC) & Marketing Boards and State Governments. Assistance will also be available for taking up cold chain components so as to integrate the activities into a single project, as a new component during XII Plan. Proposals on long distance transport solutions on project basis shall be supported under NHB sub-scheme.

## **20. CREATION OF MARKET INFRASTRUCTURE**

Main objectives of providing assistance under this component are (a) to encourage investments from private and cooperative sectors in the development of marketing infrastructure for horticulture commodities (b) strengthen existing horticulture markets including wholesale and rural markets; (c) focus on promotion of grading, standardization and quality certification of horticulture produce at farm/market level to enable farmers to realize better price; and (d) create general awareness among farmers, consumers, entrepreneurs and market functionaries on market related agricultural practices. Assistance under the Scheme will be provided as credit linked back ended subsidy for setting up whole sale markets, rural markets/apni mandis and retail markets. In case of Terminal markets, assistance will be provided in accordance with approved norms, for which guidelines have been issued separately, and available on the NHM website. Assistance will also be provided for setting up static / mobile vending cart/platform with cool chamber. Assistance will also be extended for setting up functional infrastructure as credit linked back ended subsidy. Assistance for setting up markets will only be given to those States/UTs which have amended their State Agricultural Produce Marketing Committee (APMC) Act and have also notified the amended rules there under to implement the provisions for:

- a) Setting up of new markets in private and cooperative sector;

b) Direct marketing (sourcing of horticulture produce directly from growers by wholesalers/ bulk

retailers/ processors/ exporters/ end users). (If trade transaction of horticulture perishables takes place outside the market-yard, no market fee should be levied)

c) Doing away with requirement of having a premises within the market yard for grant of license.

d) Contract farming and.

e) Waiver of market fee on perishable horticulture produce.

Assistance will be available to individuals, Group of farmers/growers/consumers, Partnership/ Proprietary firms, Self Help Groups (SHGs), Farmers Producer Organization (FPOs), Companies, Corporations, Cooperatives, Cooperative Marketing Federations, Local bodies, Agricultural Produce Market Committees (APMC) & Marketing Boards and State Governments. Projects submitted by only those APMCs will be considered for assistance, which do not levy market cess on horticulture produce. Cost of land involved in infrastructure projects will be restricted to 15 per cent of project cost in rural areas and 25 per cent in urban areas. The entrepreneur will not alienate land during period of loan for any purpose other than the purpose for which project is sanctioned. A separate undertaking from entrepreneur is required to be included in this regard in the Detailed Project Report. Size of project will be determined on basis of economic viability and commercial considerations; Quality control / analysis lab has been included under the Mission wherein assistance will be provided for setting up quality control labs having necessary infrastructure and manpower facility to check quality of horticultural produce vis-à-vis international standards.

## **21. PROCESSING & VALUE ADDITION**

Processing of horticultural produce and value addition is an important activity. While primary/ minimal processing units will be promoted under NHM, large scale processing units will be promoted by Ministry of Food Processing Industries (MFPI), out of their ongoing Schemes. However, food processing units in Himachal Pradesh, Jammu & Kashmir and Uttarakhand will be

promoted under HMNEH. The NHB will take up projects on product promotion, market information and market intelligence services for horticulture crops. CDB will take up similar services for coconut.

### **Key Elements of MIDH**

- ❖ Base line survey
- ❖ Involvement of PRI
- ❖ Area based Annual and Perspective Plans
- ❖ Applied Research with focus on Region (HMNEH) and crop
- ❖ Demand driven production based on cluster approach
- ❖ Availability of quality seeds and planting material
- ❖ Technology driven programmes to improve productivity and quality, e.g.
- ❖ Post-Harvest Management and cold chain
- ❖ Marketing infrastructure development
- ❖ FIGs/FPCs/FPOs
- ❖ Data base generation, compilation and analysis
- ❖ Technical Support by NLAs

### **VII. Annual action plan**

In this context, AAP needs to be supported with data/write up on outcome of past interventions covering the details of area expansion (variety/species introduced, increase in productivity achieved and number of clusters created), water resource development as per felt need of the State (amount of irrigation potential created, whether linked with micro irrigation, maintenance etc), INM/IPM (including requisite infrastructure created and how these are being utilized for benefit of farmers) and organic farming. Area expansion should be determined based on availability of planting material and a seed/planting material sub-plan shall be prepared separately as part of AAP. Ministry of Agriculture will communicate the tentative outlay for the year to each State / NLA, which in turn will indicate sector-wise/district-wise allocation. Agencies at District level will prepare

AAP keeping in view their priority and potential and submit the plan to State Horticulture/Bamboo Mission within the allocated sum. The States may engage TSG/Consultancy services for preparation of Perspective/Strategic/Annual Action Plans. State Horticulture/ Bamboo Mission in turn will prepare a consolidated proposal for State as a whole, get it vetted by the respective State Level Executive Committee (SLEC) and furnish the same, including copy in electronic format, to Ministry of Agriculture (MoA) for consideration by National Level Executive Committee (EC). All issues relating to horticultural/Bamboo development, covering production, post-harvest management and marketing will be covered by SHMs/SBDAs. While finalizing the AAPs, due attention will be paid for earmarking specific targets for Scheduled Caste, Scheduled Tribe and women beneficiaries. As an inbuilt provision under MIDH scheme, higher rates of subsidy have been envisaged for taking up activities like creation of infrastructure for post-harvest management and marketing of horticulture produce along with area expansion by beneficiaries in the North Eastern States, Himalayan States, Tribal Sub Plan areas, Andaman & Nicobar and Lakshadweep Islands.

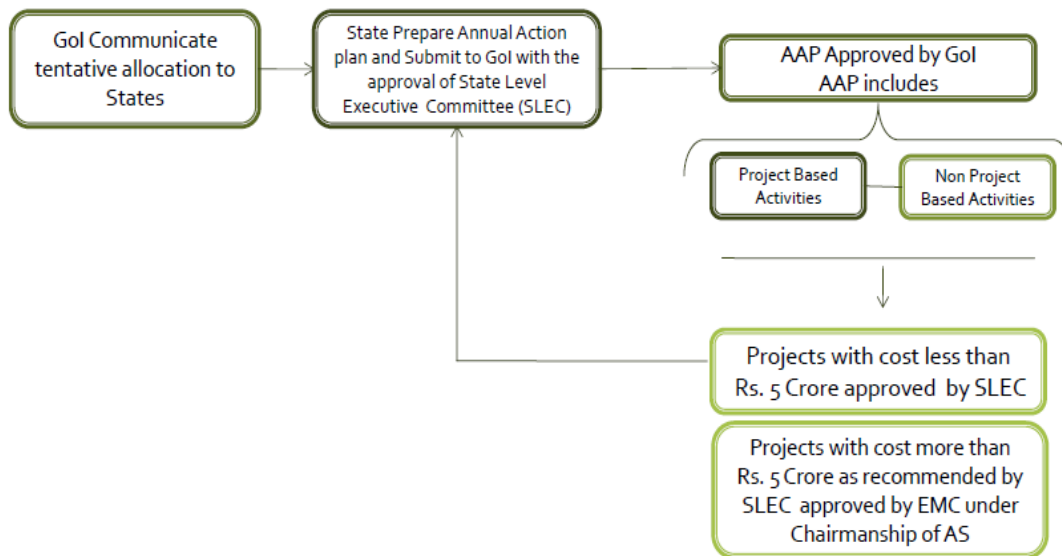


Fig 2: Annual Action Flow

### National Level Agencies

- ❖ National Horticulture Board (NHB), Gurgaon
- ❖ Coconut Development Board, Kochi

- ❖ Small Farmer's Agri-Business Consortium (SFAC), New Delhi
- ❖ Directorate of Cashew and Cocoa Development (DCCD), Kochi
- ❖ Directorate of Arecanut and Spices Development (DASD), Calicut
- ❖ National Committee on Plastics Applications in Agriculture & Horticulture (NCPAAH), New Delhi
- ❖ National Horticulture Research & Development Foundation, Nashik
- ❖ National Bee Board (NBB)
- ❖ Hindustan Insecticides Ltd. (HIL)
- ❖ Central Institute of Horticulture (CIH), Nagaland
- ❖ National Centre for Cold Chain Development (NCCD)
- ❖ National Institute of Agricultural Marketing (NIAM)
- ❖ Mahalanobis National Crops Forecast Centre, MNCFC
- ❖ Indian Agricultural Statistics Research, IASRI
- ❖ Spices Board
- ❖ National Seeds Corporation, New Delhi
- ❖ National Research Centre for Citrus, Nagpur

### **VIII. Projects under MIDH**

#### **1. CHAMAN- Coordinated Horticulture Assessment & Management using Geoinformatics**

Ministry of Agriculture & Farmers Welfare launched a programme, called CHAMAN (Coordinated Horticulture Assessment & Management using geoinformatics) during September,

2014, with an aim to use space technology for better horticultural inventory and development. The two and half year duration programme has following objectives.

### **Objectives of CHAMAN Project**

1. Area assessment and production forecasting of 7 major horticultural crops in selected districts of major states
2. Geospatial applications for Horticultural Development and Management Planning
3. Detailed scientific field level studies for developing technology for crop identification, yield modelling and disease assessment Area and Production

### **Area and Production Assessment**

This first objective has two components: a) Remote Sensing technique and b) Sample survey techniques. While Mahalanobis National Crop Forecast Centre (MNCFC) is the National Level Agency (NLA) for the remote sensing component, Indian Agricultural Statistics Research Institute (IASRI) is the NLA for the sample survey component. This article deals with the remote sensing component of the project.

Geospatial Technology for Horticultural Development Under this project, satellite data and various other thematic information, viz. land use/land cover map, weather and soil data, existing infrastructure information, socio-economic data will be analysed in GIS (Geographical Information System) tools for generating developmental plans. The Horticultural development studies can be grouped into following categories: i) Site-suitability: for introduction/ expansion of important horticulture crops in wastelands, e.g. horticultural development of Jhum (shifting cultivation) lands in North Eastern states. It is also proposed to carry out the site-suitability for expansion of grape orchards in different parts of the country.

ii) Post-harvest Infrastructure: G I S and remote sensing will be used to assess the need and to find the optimum locations for infrastructures such as cold chains, markets, etc. iii) Crop Intensification: In areas where cropping intensity is low and regions of unutilized/under-utilized, short duration horticultural crops can be incorporated into the crop rotation.

iv) GIS Database Creation: Under this aspect the orchard maps are being generated, along with different characteristics (age, species, variety etc.), which are being uploaded on Bhuvan platform for better management of the Orchards.

v) Orchard Rejuvenation: This would aid in identifying the plantations/ orchards that need rejuvenation and assess the shifting of orchard areas especially of Apples in Himachal Pradesh, Mango (West Bengal & UP) , Orange (Darjeeling) and Citrus in Arunachal Pradesh.

### **Implementation Partners**

Large numbers of organizations are partners in this activity. The major responsibility of project coordination and implementation is with MNCFC and its incubation, development and technology transfer are with Space Applications Centre, ISRO. State Horticulture Departments have a strong role in the project, not only for providing the crucial field information, but also providing inputs for horticultural developmental plans.

### **CHAMAN Phase -II:**

Based on the success of the CHAMAN-Phase-I, DAC&FW approved the Phase-II of CHAMAN project for the period 2018-19 & 2019-2020. The major objective of the CHAMAN Phase-II is operationalization of the technologies developed during the Phase-I, taking up new crops and research & development studies, especially the crop yield modelling.

Objective:

- Inventory of horticultural crops (as under CHAMAN project), selected districts
- Geospatial applications studies for horticultural development in the State of Madhya Pradesh.

### **Project Chaman – Important Features**

1. CHAMAN carries out mapping of area and output of 7 horticultural crops in 12 states.
2. The Geo-Spatial Studies would be conducted in all major states of the country and remote sensing technology would be extended to other horticulture crops in future, giving a boost to horticulture in India.

3. It can help horticulture sector provide nutrient-rich crops to the people and thus ensuring food and nutritional security to all people.
4. It creates a digital inventory of all horticultural zones in the country.
5. It can help in identifying areas of high Post-harvest losses which can be reduced by the creation of desired Post Harvest Infrastructures like cold storages. It will help in deciding the cold storage hubs.
6. It will help manage inflation by providing accurate data of food stocks.

## **2. HORTNET project**

HORTNET is one stop, multitenant integrated online workflow automation solution to the requirements of SHM and other stakeholders besides farmers. It is a unique intervention to accomplish e-Governance in NHM where-in total transparency has been envisaged in all the processes of workflow i.e., online application filing, authentication, processing and online payment to the beneficiary's bank account through DBT. Web enabled work flow based system for providing financial assistance under MIDH.

### **Key Features**

1. Online filing at HORTNET Portal by Farmer directly
2. Registration & Scheme filing from anywhere across the globe
3. Personal counseling is possible and reasons for rejection, if any, is recorded
4. Farmer can have information on entire departmental schemes
5. Information is instantaneous accessible to all level officers (District/ State / NHM) of each applicant
6. Total transparency is possible.
7. Status of the application can be known by Farmer from any where
8. Uniform hassle free online transfer of subsidy to Farmer's Bank Account through Electronic Fund Transfer (EFT).

9. Reports are available online

10. Enables dynamic generation of Reports

11. Eliminates duplicacy

12. HORTNET Portal is user friendly i.e. any person can see without User-Id & Password.

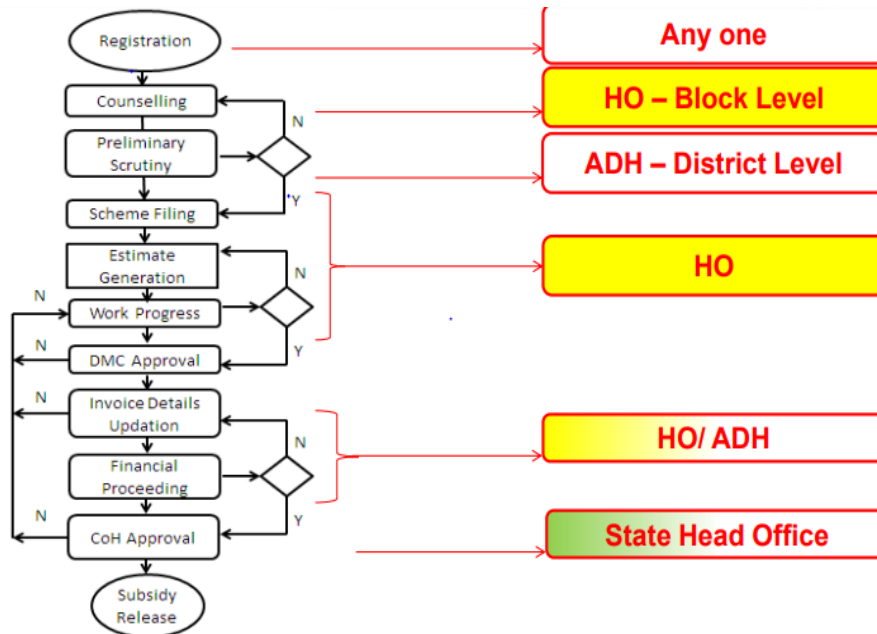


Fig 3: HORTNET Work Flow

### IX. Impact of MIDH interventions

- ❖ Area Expansion: 37.80 lakh ha
- ❖ 1657 Nurseries Accredited
- ❖ 4712 Nurseries assisted
- ❖ 20.86 million MT Cold Storage Capacity added (4650)
- ❖ Ripening Chambers: 534
- ❖ Reefer Trucks: 411

- ❖ 30 Centers-of-Excellence with Indo-Israel collaboration for high-tech horticulture and 7 Indo-Dutch Centres of Excellence
- ❖ 104922 farm ponds constructed
- ❖ Training to 23.93 lakh farmers

**Table 1: State/UT-wise allocation of funds under MIDH**

**Rs in Crores**

Sl. No.	State/ Implementing Agency	2019-20	2020-21	2021-22	2022-23
1	A & N Islands	2.00	3.00	2.10	2.10
2	Andhra Pradesh	114.00	120.00	180.00	166.68
3	Arunachal Pradesh	26.00	22.00	19.56	20.28
4	Assam	84.00	60.00	60.00	60.00
5	Bihar	22.50	25.00	33.33	33.34
6	Chhattisgarh	123.00	110.00	146.67	133.34
7	Daman & Diu	1.50	1.00	4.30	1.00
8	Delhi	0.50	0.00	0.00	0.50
9	Goa	3.00	3.00	4.00	4.00
10	Gujarat	127.00	110.00	146.67	136.68
11	Haryana	110.00	120.00	160.00	133.34
12	Himachal Pradesh	55.00	55.00	48.89	38.90
13	Jammu & Kashmir	135.30	100.00	38.89	27.78
14	Jharkhand	34.00	30.00	35.00	35.00
15	Karnataka	130.00	130.00	195.00	180.00
16	Kerala	39.50	40.00	46.67	46.68
17	Lakshadweep	0.50	0.50	0.40	0.40
18	Ladakh			16.00	19.00
19	Madhya Pradesh	38.50	65.00	86.67	75.00
20	Maharashtra	158.00	130.00	151.67	140.00
21	Manipur	37.00	26.00	26.00	28.90
22	Meghalaya	42.00	25.00	19.44	22.22
23	Mizoram	30.00	30.00	30.00	35.56
24	Nagaland	32.00	26.00	26.00	33.34
25	Orissa	89.00	67.00	78.17	68.34
26	Puducherry	3.00	3.00	2.10	1.50
27	Punjab	71.00	47.00	54.83	51.84
28	Rajasthan	90.50	60.00	70.00	65.00
29	Sikkim	25.00	25.00	25.00	25.00
30	Tamil Nadu	98.00	115.00	172.00	170.84
31	Telangana	28.00	28.00	32.67	31.68
32	Tripura	44.00	26.00	20.22	23.34
33	Uttar Pradesh	67.00	80.00	106.67	100.00
34	Uttarakhand	55.00	55.00	48.89	38.90
35	West Bengal	44.00	34.00	39.67	38.34
	<b>Total</b>	<b>1960.30</b>	<b>1772.00</b>	<b>2124.81</b>	<b>1988.82</b>

**Table 2: Year wise allocation of funds for various interventions in Karnataka (2017-18 to 2021-22)**

**Rs in Lakhs**

SL.No.	Years	2017-18	2018-19	2019-20	2020-21	2021-22	Average allocation per year
<b>Intervention</b>							
1	Nursery and planting materials	165.40 (1.37)	445.13 (2.05)	363.63 (1.90)	422.50 (2.14)	1125.00 (6.51)	504.33 (2.80)
2	Establishment of new garden	1136.00 (9.39)	1617.45 (7.47)	1391.27 (7.27)	1578.44 (8.00)	1188.42 (6.88)	1382.31 (7.69)
3	Maintenance of orchard	246.60 (2.04)	252.32 (1.16)	296.37 (1.55)	298.77 (1.51)	275.91 (1.60)	273.99 (1.52)
4	Mushrooms	66.00 (0.54)	104.00 (0.48)	72.00 (0.38)	78.00 (0.40)	264.00 (1.53)	116.80 (0.65)
5	Rejuvenation/replanting	129.00 (1.07)	605.00 (2.79)	650.00 (3.40)	613.00 (3.11)	484.00 (2.80)	496.20 (2.76)
6	Creation of water resource	1352.50 (11.18)	2192.25 (10.12)	2756.50 (14.40)	2878.80 (14.59)	2037.00 (11.37)	2243.41 (12.48)
7	Protected cultivation	2458.40 (20.32)	5283.99 (24.39)	3338.00 (17.45)	4377.60 (22.18)	3101.00 (17.94)	3711.80 (20.64)
8	Promotion of IPM/INM	357.00 (2.95)	480.00 (2.22)	535.00 (2.80)	405.00 (2.05)	108.00 (0.62)	377.00 (2.10)
9	Adoption of organic farming	30.00 (0.25)	29.00 (0.133)	12.00 (0.06)	14.00 (0.07)	20.00 (0.12)	21.00 (0.12)
10	CoE of Horticulture	4.50 (0.04)	972.82 (4.49)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	195.46 (1.09)
11	Beekeeping	70.10 (0.58)	114.02 (0.53)	63.41 (0.33)	63.68 (0.32)	5.00 (0.02)	63.24 (3.46)
12	Horticultural Mechanization	485.30 (4.01)	513.50 (2.37)	658.22 (3.44)	791.80 (4.01)	664.32 (3.84)	622.63 (0.24)
14	Human Resource Management	370.30 (3.06)	265.00 (1.22)	359.66 (1.88)	69.30 (0.35)	7073.45 (40.03)	1627.54 (9.05)
15	Post -Harvest Management	4382.40 (36.22)	6529.28 (30.13)	7526.75 (39.34)	6963.92 (35.28)	49.20 (0.29)	5090.31 (28.30)
16	Markets	120.00 (0.99)	360.75 (1.66)	156.25 (0.82)	250.00 (1.23)	4.00 (0.02)	177.48 (0.99)
17	Special interventions	0.00 (0.00)	199.20 (0.92)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	39.84 (0.22)
18	Awareness, Survey, /TSG	116.70 (0.96)	320.00 (1.47)	240.00 (1.25)	100.50 (0.509)	105.50 (0.61)	176.54 (0.98)
19	Mission management	605.90 (5.00)	1083.00 (4.99)	696.55 (3.64)	800.00 (4.05)	754.82 (4.36)	787.87 (4.38)
20	Grand total	12100 (100.00)	21666.67 (100.00)	19132.97 (100.00)	19735.4 (100.00)	17281.02 (100.00)	<b>17983.21 (100.00)</b>

## X. Success stories

### 1. Success Story of Intervention of HMNEH Scheme in East Khasi Hills District under Mawphlang Development Block

Phansawrang village under Mawphlang Development Block may be considered as one major vegetable growing cluster under East Khasi Hills district. Rapid expansion of area under carrot cultivation has caught the attention of many aspiring farmers of the village and as a result has made easy for the government functionaries to extend their help in extending their support through various schemes which include the central sponsored HMNEH Scheme.

The office of the Horticulture Development Officer, Mawphlang Block was pleased to witness another transformation in Phansawrang village with regards to successful implementation of HMNEH scheme. Shri Lektor Mawnai a beneficiary under the scheme explained about the changes that took place in his farming activities after he decided to take up carrot cultivation in commercial scale. Lektor explained that he owes a lot to the Department especially the officers from the district that have rendered all their help and encouragement in various forms such as input support, training programmes etc has resulted a better economic life as far as improvement in his family income. Like the other successful carrot growers in the village, Shri Mawnai followed the techniques of the field officers to raise his own seeds for his additional requirement and in case of any surplus he sells at a very good price which has added more benefit to his income. When enquired about the cost benefit of carrot cultivation, it was observed that there is not much of a difference from the other carrot growers of the neighboring area.



LEKTOR MAWNAI OF PHANSAWRANG VILLAGE  
A BENEFICIARY OF HMNEH SCHEME

With regards to the major share of input support that he received from the Department in the form of Seeds, FYM, Plant Protection Chemicals and Equipment, etc. his contribution comprised mainly in the labour component. Lektor informed that he could grow and harvest carrot

continuously up to the month of November and this was possible due to the techniques that he received from the technical experts of the Department of Agriculture. His farm records revealed that his net income from one cropping season is approximately 3 Lakhs as per the statistics mentioned below:

1. Apart from the input support that he obtained from the Department through the HMNEH scheme, his overall expenditure right from planting to harvesting is around Rs.3,00,000/-
2. The Average Yield Per Hectare = 20MT (20000 Kgs)
3. The Average Wholesale Price = Rs. 30/ Kg
4. Total Income = Rs. 6,00,000/-
5. Net Profit= (6,00,000- 3,00,000) = Rs. 3,00,000

Lektor is a happy farmer as this intervention has enable him to support his family and with his additional income he has acquire a new plot of land where he decided to grow other varieties of vegetable crops such as Tomato, Capsicum, etc. The success and endeavour of Lektor and other farmers like Shri Samlang Pyrtuh of Phansawrang village has drawn the attention of other neighbouring farmers and stimulated the entire area to go for large scale horticultural activities. This is one of the unique achievements of the successful implementation of HMNEH scheme, and as a result the implementing agency has a future plan to consider the entire Phansawrang village as a major vegetable growing area.

## 2. Bee Keeping

Mr. Vignesh of Thirthahalli taluk, Karnataka aged 52 years has a small land holding of 0.8 hectare in which cardamom and arecanut are cultivated. He practices homestead bee-keeping on a small scale with two beehive boxes with each box containing three trays (Figure 8.22 and 8.23). The bee-keeping equipment was obtained under the guidance of Horticulture officers and availed of under the subsidy of NHM. An annual production of 12 Kilos and the selling price of Rs.300/Kg provide him an income of Rs.3600. However, despite such a miniscule income. Mr. Vignesh considers this a boon, as it helps pollination of cardamom plantation largely.



Figure 8.23: Bee box of Mr. Vignesh of Thirthahalli taluk, Shivamogga district, Karnataka

## XI. Research studies

### Study 1: Impact Evaluation of National Horticulture Mission (NHM) and Horticulture Mission for North East (HMNEH)

Manjunatha *et al.* (2017)

**Methodology:** The sampling design employed was Multistage Stratified Random Sampling. The primary data was collected from 4033 beneficiaries across the country covering 10 major components namely Area Expansion, Rejuvenation, Protected Cultivation, Nurseries, Promotion of IPM/INM, Pollination support through Bee Keeping, Water Resources, Horticulture Mechanisation, Integrated Post-Harvest Management and Creation of Market Infrastructure. The institutions concerned and other stakeholders were also interviewed.

**Table 1: Component-wise physical and financial achievemem**

Component	Total expenditure (in Rs. crores)	Per cent to total expenditure	Cost per unit (Rs.)	Achievement relative to target (PHY)	Achievement Efficiency coefficient (PHY)	Achievement relative to target (FIN)	Achievement Efficiency coefficient (FIN)
Area expansion	2001.50	22.09	31122	1.12	0.96	1.24	1.36
Rejuvenation	260.98	2.88	15046	0.88	0.75	0.89	0.98
Protected cultivation	2113.30	23.32	276876	3.34	2.85	0.91	1.00
IPM	54.93	0.61	1334	0.90	0.77	0.96	1.05
Nurseries	97.61	1.08	904641	1.13	0.97	0.91	1.00
Water resources	659.19	7.27	197104	1.13	0.97	0.91	1.00
PHM	1235.91	13.64	341760	0.62	0.53	0.72	0.79
Markets	54.80	0.60	468365	0.38	0.32	0.39	0.43
Bee-keeping	82.51	0.91	1608	0.98	0.84	0.99	1.09
Horti. mechanisation	461.15	5.09	37241	1.09	0.93	1.16	1.27
Others	2039.85	22.51	17186	1.32	1.13	0.71	0.78
<b>Total</b>	<b>9061.74</b>	<b>100.00</b>		<b>1.17</b>	<b>1.00</b>	<b>0.91</b>	<b>1.00</b>

**Table 2: Gross value of Horticultural Production before and after NHM/HMNEH**

Sl. No.	States / UTs	GVP (2004-05) (Rs. in Crore)	GVP (2013-14) (Rs. in Crore)	% change
1	Karnataka	20247	32461	60.33
2	Maharashtra	35144	46125	31.25
3	Andhra Pradesh	26681	37107	39.08
4	Gujarat	14336	33895	136.42
5	Madhya Pradesh	7900	38221	383.79
6	Uttar Pradesh	29883	44409	48.61
7	Rajasthan	5434	7950	46.31
8	Tamil Nadu	18818	30625	62.74
9	West Bengal	45091	66807	48.16
10	Odisha	14122	20825	47.47
11	Bihar	13968	19585	40.21
12	Chhattisgarh	3345	13030	289.51
13	Telengana	0	14259	0.00
14	Assam	10730	17443	62.56
15	Haryana	4009	8054	100.90
16	Kerala	16616	15032	-9.53
17	Jharkhand	4533	12180	168.72
18	Jammu and Kashmir	4573	9378	105.10
19	Himachal Pradesh	4976	6233	25.27
20	Uttarakhand	3359	3851	14.67
21	Punjab	4371	7408	69.48
22	Tripura	1308	2801	114.18
23	Meghalaya	888	1625	83.12
24	Goa	769	897	16.67
25	Nagaland	332	1943	484.53
26	Manipur	656	1913	191.47
27	Arunachal Pradesh	746	2707	262.76
28	Sikkim	282	1017	260.23
29	A & N Islands	115	227	97.31
30	Mizoram	148	1008	579.56
31	Puducherry	117	0	-100.00
	<b>All India</b>	<b>293498</b>	<b>499017</b>	<b>70.02</b>

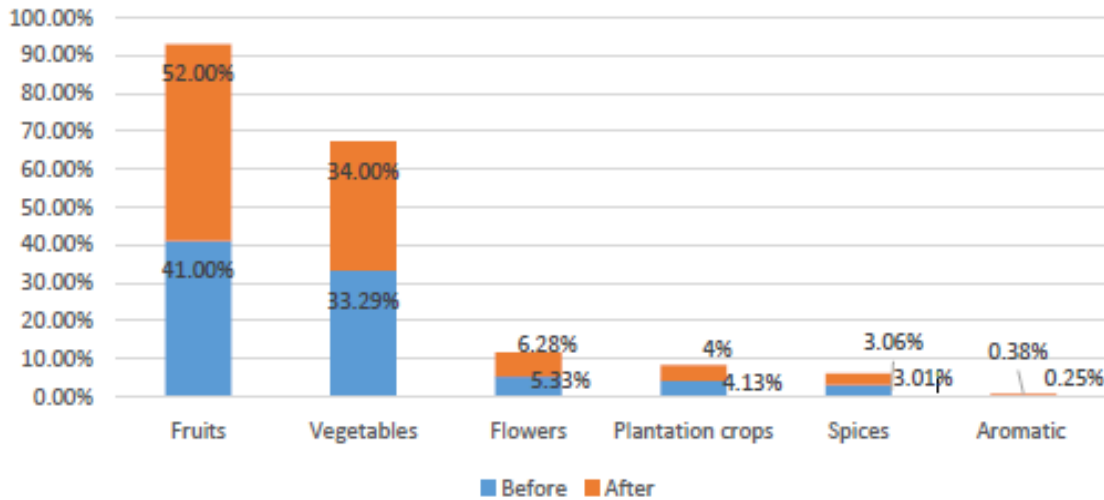
**Results and Conclusion:** The results concluded that gross value of output has positively increased over years. The increase in gross value of output for all India level was found to be 70 per cent and the fund utilization has been going on in a planned way as amply reflected by the target to physical and financial achievement ratio of 1.17 and 0.91 respectively.

## Study 2: Impact Evaluation of National Horticulture Mission (NHM) and Horticulture Mission for North East (HMNEH)

Anonymous (2020)

**Methodology:** A multistage, stratified, random cum purposive sampling design was followed keeping in view the nature of the assignment. 4868 beneficiaries are selected.

**Figure 1: Percentage of area change under different horticulture crops of the beneficiaries**



**Table 1: Zone wise financial performance from 2014-15 to 2018-1**

Zones	Total Allocation (Rs. in crore)	Expenditure (Rs. in crore)	Achievement (%)
Zone-1 North & Central	2593.34	2151.28	83%
Zone-2 South	2673.84	2323.28	87%
Zone-3 East	1362.70	898.30	66%
Zone-4 West	2243.02	1736.72	77%
Zone-5 North East	1648.61	1109.77	67%
Zone-6 Northern Hilly States	677.87	756.74	112%
<b>Grand Total</b>	<b>11,199.38</b>	<b>8,976.08</b>	<b>80%</b>

**Table 2: Zone wise impact on income of the beneficiaries**

<b>Zones</b>	<b>Avg. income Before (in Rs. Lakhs)</b>	<b>Avg. income after (in Rs. Lakhs)</b>	<b>Impact (% Change)</b>
Zone-1 North & Central	43.27	57.88	33.8%
Zone-2 South	20.43	27.53	34.8%
Zone-3 East	11.63	13.31	14.4%
Zone-4 West	17.28	27.31	58.0%
Zone-5 North East	18.629	32.54	74.7%
Zone-6 Northern Hilly States	8.26	13.85	67.7%
<b>Grand Total</b>	<b>119.5</b>	<b>172.4</b>	<b>44.3%</b>

**Results and Conclusion:** The results concluded that of all the zones, Northern Hilly States zone (112%) has utilized the maximum fund allocated for various horticulture activities which is followed by South zone (87%), North & Central zone (83%) and West (77%). North East (67%) and East zone (66%) have performed relatively low in terms of overall expenditure. Except UTs and a few states like Arunachal Pradesh, Kerala and West Bengal all states have utilized more than 60 per cent funds. The percentage indicates efficiency in the utilization of allocated funds. There has been an increase in area of fruits (5.42%), vegetables (2.51%) and flowers (1.56%) meanwhile minor decline was noted under plantation crops (0.15%), spices (0.26%) and aromatic plants (0.02%). Average income of the beneficiaries was compared before availing the scheme and after availing the scheme. It was observed that North East has achieved the highest impact in terms of per capita income enhancement by 75 per cent which is followed by Northern Hilly States (67%) and west zone (58%). East zone has remained the lowest of all the zones in terms of income enhancement with 14 per cent achievement.

### Study 3: Impact of Mission for Integrated Development of Horticulture in Haryana

Priyadarshini *et al.* (2020)

**Methodology:** This study is based on both primary and secondary data. primary data was collected from 30 kinnow growers in Sirsa district of Haryana. Secondary data related to area, production, productivity of total horticultural crops was collected from department of horticulture, government of Haryana.

**Table 1: Trends in Area, Production, Productivity in Haryana**

Years	Area (000ha)		Production (000MT)		Productivity (tonnes/ha)	
	Total Horticultural crops	<u>Kinnow</u>	Total Horticultural crops	<u>Kinnow</u>	Total Horticultural crops	<u>Kinnow</u>
2005-06	277.40	5.04	3292.40	69.56	11.87	13.80
2007-08	320.40	8.21	3618.00	66.84	11.29	8.14
2009-10	354.70	13.84	4386.70	98.33	12.37	7.11
2011-12	424.70	17.66	5671.94	214.17	13.36	12.12
2013-14	448.10	19.38	6285.50	235.35	14.00	12.14
2015-16	494.20	19.65	7053.84	301.76	14.27	15.36
2017-18	555.89	20.83	9117.52	335.82	16.40	16.13
<b>CGR (% p.a.)</b>	<b>5.22</b>	11.69	<b>7.97</b>	17.67	<b>2.60</b>	5.36

**Results and Conclusion:** The results concluded that crop growth rate in area, production, productivity of total horticultural crops in Haryana was found to be of 5.08 per cent, 7.55 per cent and 2.34 per cent respectively. A positive growth trend was observed in horticulture sector after implementation of this scheme.

## **XII. Conclusion**

Even though more attention was captured by horticulture sector there still exist a large number of challenges and problems. India can emerge as a far bigger producer and exporter if sufficient emphasis by mission for integrated development of horticulture is given on resource allocation, infrastructure, more R &D, technological upgradation and better policy framework for horticulture sector.

## **XIII. Discussion**

### **1Q. Why MIDH is called as holistic approach?**

**Ans:** MIDH is a holistic approach as it is concentrating from pre-production to marketing.

### **2Q. How Post harvest losses are managing?**

**Ans:** MIDH is focusing on post harvest management through the intervention integrated post harvest management. It provides assistance to pack house, pre-cooling units, cold rooms, cold storage units *etc.*

### **3Q. What are the challenges of MIDH?**

**Ans:** The project of MIDH is considered for assistance under the scheme only after a satisfactory visit by the officials of SHM. Cost norms fixed over duration of 5 years does not capture the incremental cost year-on-year basis or inflation.

### **4Q. Whether the sub-schemes under MIDH are merged?**

**Ans:** The sub-schemes under MIDH are not merged. They have their distinct identity.

### **5Q. Is there any market interventions?**

**Ans:** Yes, creation of market infrastructure intervention is included under MIDH.

### **6Q. What is the role of extension worker?**

**Ans:** Extension worker should provide awareness to farmers regarding assistance provided to various components under MIDH. He can also provide training to them through the assistance provided by MIDH under the intervention-Human resource development.

**7Q. Are there any specific crops covered under MIDH?**

**Ans:** MIDH covers fruits, vegetables, root & tuber crops, mushrooms, spices, flowers, aromatic plants, coconut, cashew, cocoa and bamboo.

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