IMPACT OF MIDH ON THE HORTICULTURE SECTOR IN INDIA

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ABSTRACT
Horticulture is a rising industry in India and is crucial for the country's development. The Mission for Integrated Horticulture Development (MIDH) program was established by the government with the goal of developing this industry as a whole via research, technological promotion, post-harvest management, processing, and marketing. It intends to boost output, raise revenue, and give young people in rural areas work opportunities. I have made an effort to assess how the plan has affected the horticultural industry through my study. It was found in the study that area under production and production increased by 16.30% and 29.59% respectively, during (2010)-18. Fresh fruit exports increased by 73.11% between (2014-2015) and (2019-2020) The MIDH scheme has made satisfactory progress in terms of physical performance, but it is yet to reach its full potential. About 85% of physical targets are achieved every year. Progress varies widely from state to state. It is required to motivate farmers to adopt the latest technology. Identifying crops with export potential and encouraging public-private partnerships for reducing post-harvest losses and enhancing agricultural marketing is a need of the hour. Encouraging Agro-processing industries and value addition can help to boost the sector.
Keywords: MIDH, Horticulture, Agriculture, NHM, AEZ

Introduction

Horticulture means cultivation of "garden crops", which include fruits, vegetables, ornamental plants, spices, plantations, medicinal plants, and aromatic plants. It involves the intensive process of growing and manipulating plants (Indian Agricultural Statistics Research Institute (IASRI), (2013). A horticulturist's goal is to improve crop quality, yield, nutritional value, and resistance to insects, diseases, and environmental pollution, Khan (2018).

India is still an agrarian nation. Many are still dependent on this sector for their livelihood. Agriculture and the allied sector contribute about 20% to the Gross Domestic Product of the country. Horticulture nearly contributes 30 percent of agrarian GPD from merely 8.5 percent of the total cropped area ICAR (2020), as cited in Verma (2020). Verma (2020), India produces more fruits and vegetables than China at the moment. The horticulture sector not only generates additional income but also creates employment as it is a labor-intensive process. It provides backward linkage to the agro-processing industry, especially that performs fruit and vegetable preservation. Horticulture is a means of crop diversification and is also having significance from a nutritional and pharmaceutical point of view. Also, it leads to the effective utilization of wasteland, and its products can be adapted accordingly to water-scarce areas or on difficult terrains Panda, (2020). It also adds to the scenic beauty. Lastly, it augments the country's exports and hence is crucial for economic growth. These points indicate the importance of this sector for farmers as well as the Indian economy. Hence it is necessary to take measures for the development of this sector.

In India, a variety of agroclimatic conditions promote the year-round growth of a large range of horticulture crops. The output of horticulture crops was predicted to be 329.86 million tones (MT) in (2020-2021), up from the final projections of (2019-2020) (320.47 MT), the Second Advance Estimate, Tiwari (2021). A dramatic increase in horticulture crops has occurred since (2012-2013), outpacing the production of food grains. In (2017-2018), the total horticulture production was highest in the State of Uttar Pradesh, followed by West Bengal. Out of the various horticulture crops, vegetables contributed the highest (59 – 61%) in production over the last five years. Uttar Pradesh and West Bengal are the leading states in vegetable production, while in fruit production it is Andhra Pradesh and Maharashtra. In flower production Tamil Nadu and Andhra Pradesh are leading and in spices production Madhya Pradesh and Rajasthan. The bulk of India's export basket is made up of fresh fruits and vegetables (mangoes, grapes, onions, potatoes), flowers, plantation, and spice crops (black pepper, cardamom, ginger, turmeric, chilies, cashew nuts, tea, coffee, coconut, areca nut, etc.). Horticultural produce from India is mainly exported to the European and Gulf countries.

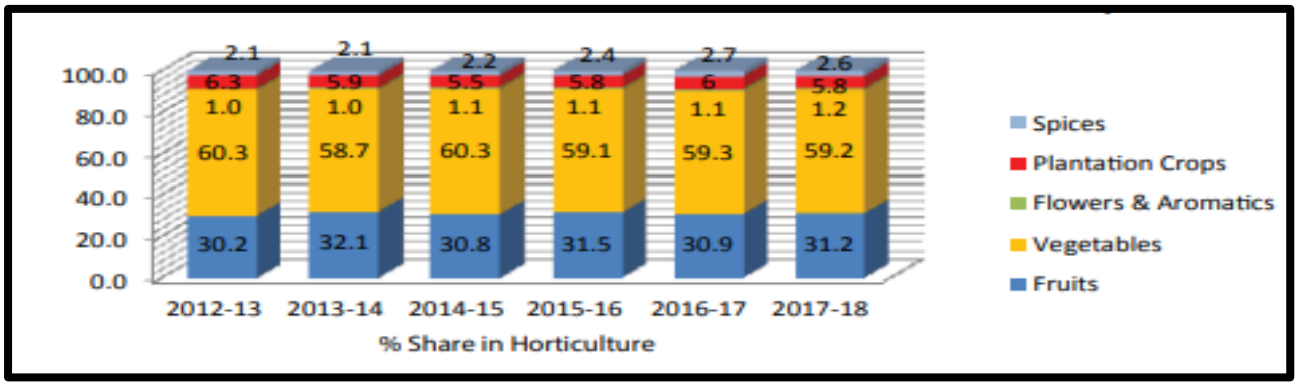

Figure 1 Production Share of various Horticulture crops; (Source: Annual Horticulture Statistics at a Glance Report (2018))

Various initiatives have been taken up over time to develop this sector. In the 7th Five-Year Plan, the horticulture sector was the focus of agricultural policy, resulting in significant increases in area, production, and productivity, Joshi (2019). Further, the state's horticultural development was prioritized under the 12th Five-Year Plan, with the goal of increasing the horticulture growth rate from 8.37 percent to 10.40 percent and bringing new horticultural lands into cultivation. This included 5.24 lac hectares of fruits, 11.50 lac hectares of vegetables, and 1.20 lac hectares of potatoes (Rashtriya Krishi Vikas Yojna, (2015-2016), as cited in Kumar (2019).

The government has introduced a number of programs to help this industry throughout time. The Mission for Integrated Development of Horticulture (MIDH) was established by the government from 2014 to 2015. It included the National Horticulture Mission (NHM), the Central Institute for Horticulture (CIH), the National Horticulture Board (NHB), the Coconut Development Board (CDB), and the Horticulture Mission for the Northeast & Himalayan States (HMNEH), Nagaland Sengar & Rani (2020). Every State and UT is included in this program. Sengar (2020) describes it as a Centrally Sponsored Scheme that intends to advance the horticultural industry. In all states under MIDH, with the exception of the Northeast and the Himalayas, the center contributes 60% of the overall budget for developmental programs. 40% of the total is contributed by state governments. The center provides 90% in the case of the Northeastern and Himalayan states, Sengar(2020).

The objectives of the scheme are as follows-

1. Grow the horticulture sector through area-based regionally differentiated strategies, including research, technology promotion, extension, post-harvest management, processing, and marketing.
2. Achieve economies of scale and scope by aggregating farmers.
3. Improve the level of production, increase the income of farmers, and strengthen the nutritional security of the population.
4. Increase production with micro irrigation by making optimal use of water, high-quality seedlings, and planting supplies.
5. Create employment opportunities for rural youth by supporting skill development.

Given these, the aim of this paper is to understand the impact of the scheme on the growth and development of horticulture in the country, by looking into the trends in the area, production, and productivity of the horticulture crops. The trends in exports are also studied to understand this.

Literature review

A study by Kumar (2019) indicated that agriculture diversification in favor of horticultural crops is emerging as a promising source of income acceleration, employment opportunities, poverty reduction, and export promotion. a national study, horticulture crops occupied 19% of the gross cropped area while producing nearly the same amount of output as food grains Chand (2017), as cited in Kumar, S. et al. Furthermore, it includes favorable cropping pattern characteristics such as using the least amount of water, growing in dry and hilly land, and having low crop failure risks. Horticulture farms are much smaller in size than cereal crop farms. As a result, small and marginal farmers now have more opportunities to increase their income from their small landholdings. This sector also provides more post-harvest value-addition opportunities Joshi (2004); Weinberger and Lumpkin (2005), which can be efficiently tapped via comprehensive measures in value chains and food processing sectors. In the research, it was found that factors such as cold storage facilities, agricultural markets, loans, expenditure on district schemes, electrification level, education level, and the irrigated area had a positive and significant impact on the per-hectare output value in this sector. The maximum temperature, on the other hand, had an adverse yet significant impact on the per-hectare output value. Upgrading rural infrastructure with prompt public interventions can help close the gaps that plague the horticultural sector and the agricultural sector in general. Mittal, S. (2007), presented instances of various emerging nations' horticultural industries in their study.

The author claimed that the European Union is one of the biggest marketplaces for fresh horticultural goods in t he globe.

One of the biggest markets in the world for fresh horticultural products is the European Union (EU).

It has progressively improved in both quantity and quality over the last 20 years, and it offers numerous emergin g nations a significant commercial opportunity.

The author emphasized that a number of elements, such as stable regulations, a welcoming investment environm ent, institutional and social linkages with European markets, and continual experimentation with market instituti ons, have contributed to the development of Kenya's horticulture sector. Several policies promote smallholder involvement. Another factor that contributed to the success was the government's limited direct intervention in the horticultural markets; using Thailand as an example, it was noted that Thailand's advantage comes from the government's strong support of its quality management system.

Choudhary (2013), in their paper, said that before the 1980s, there wasn't much-planned effort for horticultural development. Between 1980 and 1992, there was an integration of institutional support and a planned process for horticultural development. Following 1993, a greater focus was laid on horticulture development through enhanced plan allocation and knowledge-based technology. Even though this decade was named the "golden revolution" in horticultural production, crop productivity had only increased marginally from 7.5 tonnes per hectare in 1991-92 to 8.4 tonnes per hectare in 2004-05. The Government of India launched the National Horticulture Mission in 2005-06 to promote integrated development in horticulture. The country saw a huge increase in horticulture production as a result. Horticultural exports, growth, and promotion were emphasized in the foreign trade policy in 2004-11. A major role has been played by the Technology Mission for Integrated Development of Horticulture, sponsored by the Government of India. Additionally, RKVY, TSP/SCSP, BADP, and State Plan/Non-Plan initiatives have made noteworthy contributions in complementing the Technology Mission's programmatic efforts. Sengar, R. S., & Rani, V (2020), in their research "Opportunities and perspective of integrated development of horticulture: A review." stated that the success of the NHM scheme led the government to launch the Mission for Integrated Development of Horticulture (MIDH) in (2014) for holistic growth of the sector. They highlighted the various objectives of the scheme, and some other policy initiatives taken up by the government for supporting this sector. They brought the fact to light that 5 million tons of fruit and vegetables can be saved per year for every one percent reduction in post-harvest loss. Post-harvest losses can be reduced by proper handling, packaging, transportation, and storage. It helps to save produce for the off-season, improves food safety, and helps to increase exports.

a paper by Mitra (2020), the enhanced demand for various fruits, vegetables, and flowers boosted the domestic market for horticulture businesses in India. Citing the Horticulture Statistics briefly (2018), the researcher indicated that farmers evidently took advantage of the situation and invested more in horticulture, as shown by a rise in fertilizer consumption as a production input over the study period. In India, 100% foreign direct investment is permitted in the horticulture sector via the automatic route. It was realized that FDI inflows into the Horticulture Sector totaled US $ 3.8 million, accounting for 1.5% of total FDI inflows into Agriculture from (2013 to 2017). Hence it can be concluded that horticulture has been successful in attracting foreign investment. Horticulturists make a lot of money because they produce high-quality products. It has a low crop failure rate when compared to food grains, as well as the added benefit of multiple cropping facilities. As a result, it is a lucrative business opportunity.

Varadharaj (2018) analyzed the production and growth trends of spices in India. They found that area, production, and productivity of Black Pepper increased significantly. Export prices and production trends for turmeric showed positive growth. Coriander exports were positive in terms of quantity and value. Indian Chilli is popular in Malaysia, Sri Lanka, the United Arab Emirates, and Indonesia. The prime importers of Black pepper from India are the USA, Germany, Italy, and Canada. The analyses show that over the period from (2010-2015), spice production in India grew from 5350 tonnes in (2010-2011) to 6988 tonnes in (2015-2016).
A study was conducted by Khandave (2015). "Impact of National Horticulture Mission on beneficiaries", to understand the benefits received and impact of NHM on the beneficiary farmers of selected tahsils in Maharashtra. In terms of the benefits received from NHM, all farmers (100%) have established small nurseries, and perennial fruit gardens, and taken partial economic benefits from NHM. The majority of farmers (69.17%) had completed training and 37.50 percent attended study tours under HRD. The study found that 65.0% of farmers were happy with their annual income after taking advantage of NHM. Through NHM, almost all farmers (94.17%) have been able to increase their workdays to 260 days and above. In all 100 respondents, technology adoption for revitalizing old orchards has increased. In the survey, 90% of the farmers said they were not satisfied with the government's expenditure limits.

the study by Verma (2020), the major constraints perceived by Uttar Pradesh farmers in the horticulture sector were a lack of knowledge about various aspects of fruit processing and value addition, a large initial establishment cost, inadequate market infrastructure, and marketing facilities, and a lack of timely loan availability. To overcome these specific constraints, it is critical to educate producers and rural youth about, post-harvest value addition techniques, skill enhancement, and so on. The study suggested that infrastructure be built at production hubs to reduce farm-level losses and help farmers get a better price for their produce through marketing decisions.

Sinha (2022) “Impact of the National Horticulture Mission on the Growth of the Indian floriculture industry”, seasonal changes and proper crop management affect productivity. As most of India's crops are dependent on seasonal rain, loose flower production is also affected by climate change, soil quality, and post-harvest practices. The National Horticulture Mission has a significant impact on the area under cultivation and loose flower production. A lack of proper infrastructure facilities for growing cut flowers in a controlled environment has prevented the production of cut flowers from expanding significantly.

Doddamani (2014), in their paper “Dynamics of Growth and Development of Horticulture Sector in India and Karnataka: An Economic Analysis,” mentioned that India exports fruits in fresh, dried, and prepared from and vegetables in vinegar, fresh and dried, preserved and frozen form. After the implementation of the NHM program, India's fruit export growth was much faster in both quantitative and monetary terms. The joint effect of increased area and fruit production enhanced post-harvest management and value addition all contributed to this. Due to the domestic consumption of most vegetables, India's vegetable exports are declining quantitatively and in monetary terms. To boost the sector's overall growth, exports must be increased.

Research done by Kumar (2012) “Impact Study of the National Horticulture Mission Scheme in Karnataka,” indicated that because of the shorter gestation period and labor-intensive nature of flowers and aromatic crops, marginal and small farmers preferred growing them. The author concluded that infrastructure development, particularly post-harvest management and capacity building under NHM, were lacking despite some efforts. Farmers expressed dissatisfaction with marketing facilities, particularly for flowers and aromatic crops.

Another study was done in Karnataka by Gowda (2015) “National Horticulture Mission (NHM): A Game Changer for Horticultural Economy of Karnataka” revealed that because of the implementation of the NHM, significant increases were achieved in horticultural production, yield, and area. However, area coverage and integrated pest management have incurred the highest expenditures over the years. A severe shortage of infrastructure, marketing facilities, and post-harvest management prevented the full potential from being realized.

Dastagiri (2013), in their article "Indian Vegetables: Production Trends, Marketing Efficiency, and Export Competitiveness," horticultural crops require special handling and shipping since they are extremely seasonal, perishable, labor- and resource-intensive, and require a lot of capital. These items are tough to handle and carry due to their mass. Farmers are forced into distress sales to pre-harvest contractors and commission agents because of price risk caused by their seasonal production patterns. It was discovered that the producer-to-consumer route was more effective for horticultural crops. Consequently, direct marketing models should be supported by government legislation. The findings show that labor expenses, transport costs, marketing margins, and expenditures associated with marketing are all factors that limit the effectiveness of marketing.

Manjunatha (2017), in In "Impact Evaluation of National Horticulture Mission (NHM) and Horticulture Mission for Northeast and Himalayan States (HMNEH)," Manjunatha, A. V. et al. (2017) noted that the sample National Level Agencies (NLAs) had varied results. A significant portion of the overall spending across all sectors has gone to nursery (40.54%), area expansion (34.65%), and capacity-building components (11.42%). Less important are the establishment of FPOs (0.18%), minor components (0.84%), mission management (4.29%), and post-harvest infrastructure (6.99%). the study's findings, the area growth, revitalization, and nursery and seed sectors failed to meet their physical goals. The SFAC (Small Farmers Agri-Business Consortium) was shown to perform worse than capacity building and post-harvest infrastructure. A rise in output and productivity is said to be another significant trend that NHM/HMNEH has brought about in horticulture. They did not, however, succeed in lowering farmer suicide rates, offering a solid market in the case of a big harvest, or tripling farmers' income. Tuteja (2011), in their study, "Impact of the National Horticulture Mission (NHM) Scheme in Haryana", found that because of NHM, citrus fruits are the most prominent gainers in area and production among fruits. Leafy vegetables, tomatoes, and potatoes indicated a 15 percent increase in area among vegetables. Farmers' responses to capacity building through training, provision of processing facilities, marketing, and procurement in the survey were found to be disappointing, as none expressed a favorable opinion on the implementation of these. It was stated that activities such as pit-making, weeding, and intercultural operations created more employment than other activities. Most of the farmers reported higher household incomes after the NHM was implemented, but large farmers benefited most from the program. the analysis, 88.67% of horticultural crop growers benefited from the Mission's subsidies. The results of the NHM's awareness campaign were encouraging. Only 3.33 percent of selected farmers were unaware of the Mission's activities. Afroz (2021) highlighted that while, over the years, with supportive schemes for the horticulture sector, production has grown significantly, India is yet to realize its full potential in this sector. There is a need to develop the backward and forward linkages of the sector for this. Some suggestions given included overcoming the lack of storage infrastructure, reducing market inefficiencies through new marketing channels, and accelerating the transfer of technology from the lab to the field through Agri-tech- startups.

Objectives of the research

1. To analyze the impact of MIDH on the production and productivity of horticultural crops.
2. To understand the trends in horticulture crops and exports of horticulture.

Research Methodology

Various theses, research papers, research articles, and government reports have been reviewed in the study. Secondary data has been used for the research. Simple statistical tools have been used to understand the trends in data.

Analysis and the Discussion

1. Trends in area, production, and productivity-

From Table 1, the increase in area under production and annual production between (2010-2011) and (2017-18) were 17% and 30% approx. From Figure 2, taken from a report by NITI Aayog – "Evaluation of Centrally Sponsored Schemes in Agriculture, Animal Husbandry and Fisheries sector" (2020), it can be concluded that there is an increase in productivity per hectare (11.6%) as production increased at a faster rate area, and the same can be observed from table 1.

Figure 3, between 2004-2005 and (2017-2018), the production of vegetables increased from 102 million Tons to 185 million Tons, and the production of fruits increased from 50.9 million Tons to 97.35 million Tons. From the trends in the area and production of flowers and spices, it is evident that the production has increased manifold between (2010-2011) and (2017-2018). The production of flowers increased from 1636 MT to 365.1 MT, and the production of spices increased from 536 Matric Tons to 822 Matric Tons, as shown in Graph 1 and Graph 2. Horticultural Statistics briefly (2018), in the year (2017-2018) the area under vegetables was 10.26 million Hectares, and under fruits was 98 million Hectares.

Year	Area	Production	Productivity
(2010)-11	21852	240531	11.02
(2011)-12	23243	257277	11.07
(2012)-13	23694	268848	11.35
(2013)-14	24198	277352	11.46
(2014)-15	23410	280986	12.00
(2015)-16	24472	286188	11.69
(2016)-17	24851	300643	12.10
(2017)-18	25413	311714	12.25
Note: Area in '000 Ha, Production in '000 MT, Productivity: MT/Hectare			

Table 1- All India Area, Production and Productivity of Horticulture Crops over the Years, Source: Horticultural Statistics at a Glance (2018)

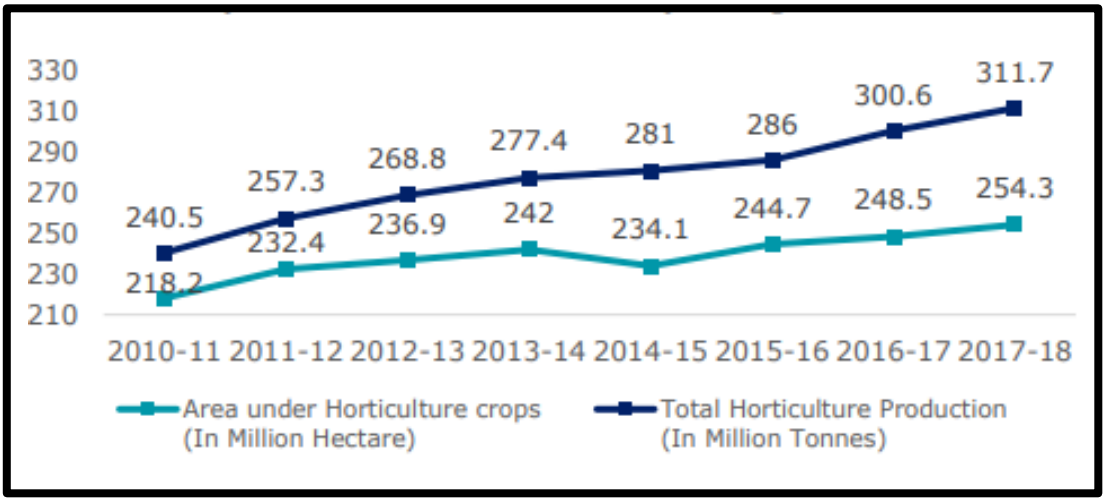

Figure 2- Total area and production under Horticulture crops from (2010-11) to (2017-18), Source: NITI Aayog- Evaluation of Centrally Sponsored Schemes in Agriculture (2020).

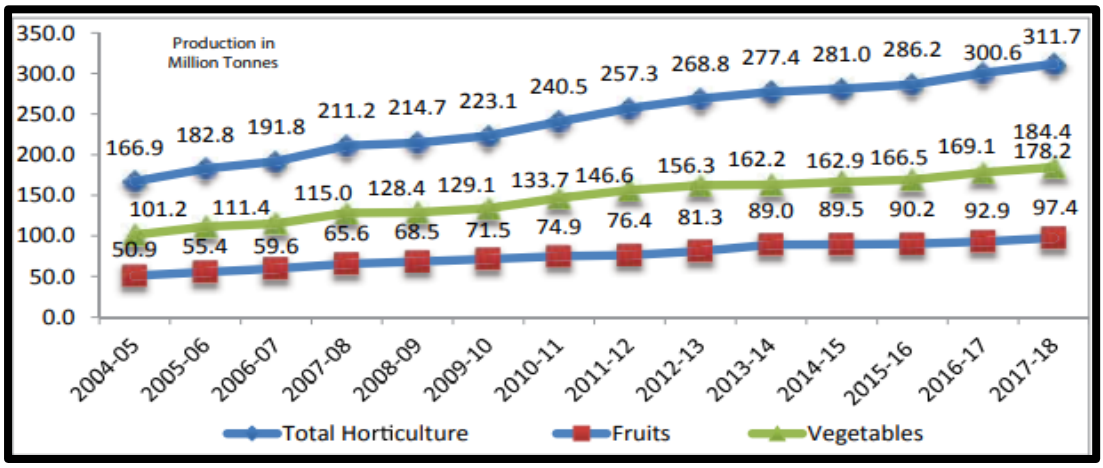

Figure 3- Horticulture production- total, fruits, vegetables , Source- Horticulture Statistics at a Glance-(2018)

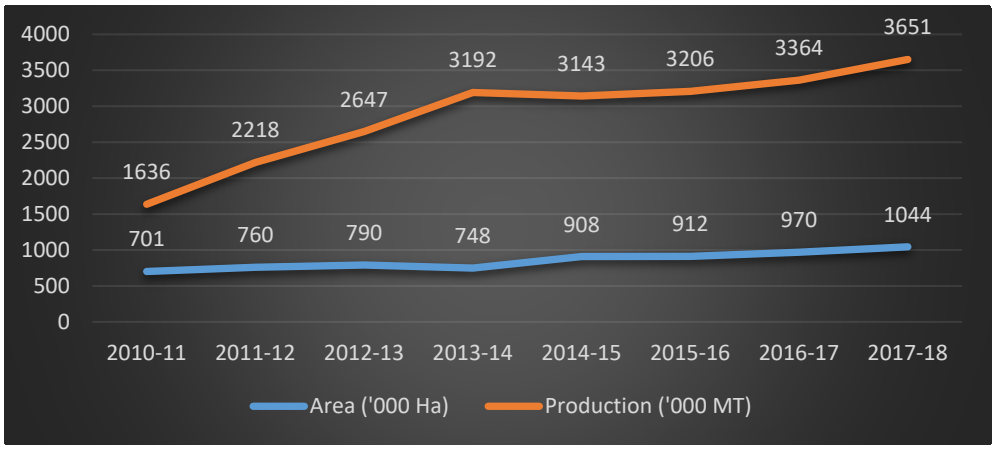

Figure 4 -Trends in Area and Production of flowers, Source- Horticulture Statistics at a Glance-(2018)

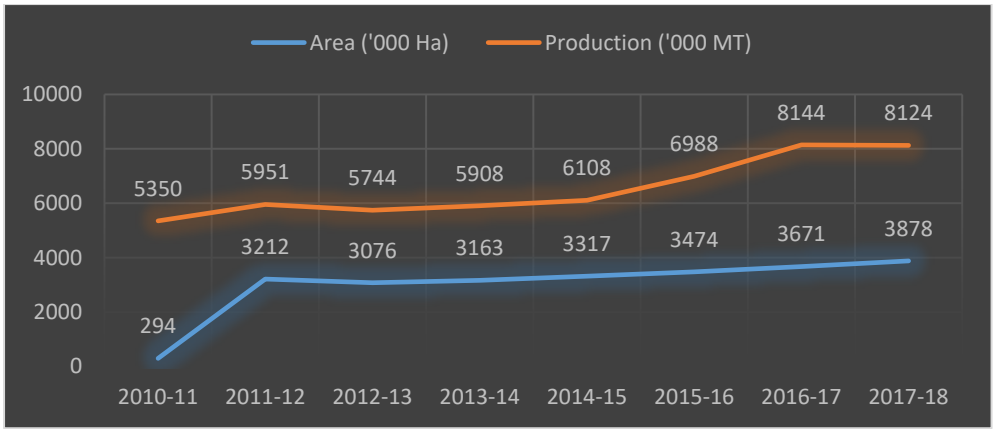

Figure 5 -Trends in Area and Production of Spices, Source- Horticulture Statistics at a Glance-(2018)

2. Export data-

From Table 2 it is evident that there is a tremendous increase in the export of fresh fruits between the years (2014-15) and (2019-20) of 73.11%. At the same time, the export of fresh vegetables and floriculture showed increases of 0.10% and 17.56%, respectively. The data for processed fruits and juices and processed vegetables in Table 3 shows an increasing trend of 27% and 28%, respectively. As per the Horticultural Statistics at a Glance (2018) report, Grapes take the lead in exports, with 188.2 thousand tons worth Rs. 1,89,994.86 lakhs. Bananas and mango are two other fruits with significant export potential. Exports of fresh vegetables (such as onions, peas, and potatoes) are increasing.

(Value in Rs. Crore)

Product Name	(2014)-15	(2015)-16	(2016)-17	(2017)-18	(2018)-19	(2019)-20
Fresh Fruits	3148.07	3918.41	4966.63	4746.31	5304.05	5449.75
Fresh Vegetables	4611.64	4762.62	5718.69	4997.49	5311.73	4616.36
Floriculture	460.7	477.76	544.78	507.26	571.02	541.61
Total	8,220.41	9,158.79	11,230.10	10,251.06	11,186.80	10,607.72

Table 2- Export of fresh fruits, vegetables, and floriculture, Source- Agricultural & Processed Food Products Export Development Authority(Ministry of Commerce & Industry, Govt. of India), https://shorturl.at/imRX4

Product Name	**(2014)-15**	**(2015)-16**	**(2016)-17**	**(2017)-18**	**(2018)-19**	**(2019)-20**
Processed Fruits & Juices	3624.41	3759.38	3904.98	4164.78	4476.5	4590.61
Processed Vegetables	1725.34	1695.82	1773.56	1823.25	2054.9	2210.51
Total	5,349.75	5,455.20	5,678.54	5,988.03	6,531.40	6,801.12

Table 3- Export of processed fruits and vegetables (Value in Rs. Crore), Source- Agricultural & Processed Food Products Export Development Authority (Ministry of Commerce & Industry, Govt. of India), https://shorturl.at/wxBIM

3. Budget utilization and achievement of targets

The figure-4 shows the NITI Aayog report, the "Evaluation of Centrally Sponsored Schemes in Agriculture, Animal Husbandry and Fisheries Sector" (2020), which includes the budget estimates (BE), revised estimates (RE), and actual estimates (AE) for the MIDH scheme. The report indicates that 85 percent of the BE has been accomplished based on the financial progress made up to (2018–2019). The MIDH has never been able to disburse all of its funds in a given year. 95% of the funds were used, and BE rose by 9.3 percent in 2018–2019.

the study, area coverage, rejuvenation, protected cultivation, mechanization, and post-harvest management have been given top priority by NMH/HMNEH. 4.75 lakh acres have been covered by MIDH from (2015–2016). Every year, area coverage has succeeded in achieving more than 80% of the goals. However, throughout time,

there has been a constant fall in the accomplishment %. In terms of physical performance, MIDH has achieved good improvement, hitting 70–85 percent of its yearly goals. Progress varies greatly from state to state. States with poorer performance hinder the advancement of the system and diminish its overall success. The inability of nations to report accomplishments and the delay in submitting utilization certificates are significant obstacles influencing mission activities. Except for (2018-2019), Chhattisgarh has consistently met all of the states' physical horticulture targets to the fullest extent possible. Jammu & Kashmir, Madhya Pradesh, and Tripura have done worse than Haryana, Karnataka, Gujarat, Chhattisgarh, and Tamil Nadu. The state with the highest unused funds is Jammu & Kashmir. The ratio of expenses to objective obtained is 0.89%, which is a remarkable achievement. The expenditure-to-target ratio was more than 1 in Maharashtra, Andhra Pradesh, Chhattisgarh, Assam, Himachal Pradesh, Tripura, Manipur, and Mizoram. However, the performance of union territories fell short of expectations.

Head	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
BE	2263	2000	1620	2329.13	2546.24	2225
RE	1990.10	1769.59	1660	2198.63	2108.07	-
AE	1958.70	1696	1495.71	2034.44	2004.85	-

Figure 6-Budget utilization in MIDH (Rs crores) Source-NITI Aayog - Evaluation of Centrally Sponsored Schemes in Agriculture, Animal Husbandry and Fisheries sector.

Conclusion

Horticulture is an industry that has the potential to boost the nation's income, employment, and exports. Launched in 2014–2015, the Mission for Integrated Horticulture Development (MIDH) aims to grow the horticulture industry holistically via research, technology promotion, extension, post-harvest management, processing, and marketing. It aims at aggregating farmers, improving production, increasing income, and creating employment opportunities for rural youth. Through this research, I have tried to evaluate the impact of the scheme on the horticulture sector.

the report, the yearly production and area under production increased by 17% and 30%, between 2010–2011 and 2017–2018. Additionally, it was noted that in areas where output expanded more quickly, there was an increase in productivity per hectare of 12%. From 51 million tonnes to 98 million tonnes of fruit were produced. Production of spices and flowers both grew, from 535 MT to 822 Matric Tons and 1636 Matric Tons to 365 Matric Tons, as well respectively. Between 2014–2015 and (2019–2020), exports of fresh fruits, vegetables, processed fruits, and juices greatly rose, with grapes assuming the top spot. In terms of physical performance, the MIDH plan has advanced satisfactorily, hitting roughly 85% of its yearly goals. Mission efforts are hampered by the low performance of some states and delayed data submission, among other things. The greatest money that hasn't been spent is in Jammu & Kashmir, and state-by-state development varies greatly. The expenditure-to-target attained ratio is 0.9%; states with ratios higher than 1 include Maharashtra, Andhra Pradesh, Chhattisgarh, Assam, Himachal Pradesh, Tripura, Manipur, and Mizoram.

While the scheme has helped to transform and develop the horticulture sector, it is yet to reach its full potential. me, research and development are needed to promote short-duration crops, techniques to mitigate climate change effects, and better pest management.

Agricultural graduates should be encouraged to set up Agri-clinics and agri-business centers for easy transfer of technology to the farm. Motivating farmers to adopt the latest technology and developing post-harvest infrastructure should be taken up by the state government. Tuteja, U. (2011) has suggested that to assist farmers in enhancing their income levels through the cultivation of horticultural crops, state governments could identify crops with export potential and declare those districts as Agri-export Zones (AEZs).

As highlighted in the literature, there is a need to ensure that proper training is given through demonstrations and workshops to the farmers. Lastly, as suggested by various researchers studied in the literature, Public-Private Partnership initiatives should be encouraged to reduce post-harvest losses and enhance agricultural marketing. Setting up processing units and alternative market channels should be encouraged.

Limitations and Future Work

The study that conducted was constrained by several factors, including methodological and geographical challenges. First of all, even if we were able to track down the surveys for the observational sample utilized in

this study, it's conceivable that they don't adequately reflect the situation based on secondary research. We want to add interviews and a primary data collecting survey to this qualitative data collection in the future to further understand the scope and relative importance of the several themes identified throughout this study.

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