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### Entrepreneurship development through High Value Fruits and Crops Extension and Marketing (HVFCEM) in Chittagong: A case study of YPSA

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#### Abstract

In Bangladesh one third of the local fruits are available round the year, while two thirds are available for three to four months only. So, bridging this gap is very important for us. In order to this Bangladesh's agriculture is transitioning to commercial farming, aiming to make it more profitable and improve farmers' living standards. However, High Value Fruits and Crops (HVFC) are central to this transformation, offering opportunities for educated youths to engage in agriculture and build careers. Researchers identified that HVFC offer higher returns on investment compared to staple crops, making them crucial for increasing farmers' income and boosting regional economies. Moreover, their production, processing, and marketing require skilled labor, creating significant employment opportunities in rural areas and helping to alleviate poverty. Currently in Bangladesh, many HVFCs are produced using sustainable practices like organic farming, which promote environment friendly agriculture, conserve biodiversity, and reduce the carbon footprint. The production of HVFCs has increased, with crops like dragon fruits, oranges, strawberries, and avocados being cultivated, along with vegetables and spices. Young Powers in Social Action (YPSA) has been working since 2022 to support HVFC production, extension, and marketing in Sitakunda and Mirsarai areas of Chattogram, targeting the ultra-poor, transitional poor, and enterprising poor people as beneficiaries. In this backdrop, this study aims to evaluate the impact of YPSA's efforts on entrepreneurship development through the promotion of HVFCs in the region. The study finds that HVFC is gaining popularity among local farmers as it offers higher return on their investment than other crops. Moreover, it helps create employment opportunities to the local unemployed through various income generating activities and entrepreneurship development activities. But still the entrepreneurs face some challenges which must be addressed in an appropriate way. Government as well as others involved in HVFC extension and marketing should focus these issues urgently.

**Keywords:** Entrepreneurship development, high value fruits and crops, HVFCEM

#### 1. Introduction

##### 1.1 Background and Rationale of the Study

High Value Fruits and Crops (HVFC) often have a higher return on investment than staple crops, making them vital for increasing income of the farmers. This contributes to the development of an economy of regions that specialize in these high value fruits and crops. But, the production, processing, and marketing of high value crops require more trained labor. However, it creates huge employment opportunities in the rural areas that helps in poverty alleviation and rural development. Moreover, many HVFC are grown with more sustainable practices, like organic farming or agroforestry, which help promoting environment friendly agriculture, conserve biodiversity, and reduce the carbon footprint of food production. Recently production of HVFC in Bangladesh has increased significantly. The largely grown high value fruits in the country include dragon fruit, sweet orange, strawberry, avocado, persimmon, rambutan, net melon, cashew nut as well as different high value crops include vegetable grown both in

lowland, and upland, and different spice etc. Young Powers in Social Action (YPSA) has been working on HVFC production, extension, and marketing since 2022 in Sitakunda and Mirsarai upazilla, Chattogram, Bangladesh. They included the ultra-poor, transitional poor, and enterprising poor people of Sitakunda and Mirsarai upazilla, Chattogram as the beneficiaries. In this backdrop it is very important to study the impact of high value fruits and crops extension and marketing (HVFCEM) project in the region. However, this study specifically intended to evaluate the impact of YPSA initiatives on employment creation, income generation, i.e. entrepreneurship development through the production, extension and marketing of High Value Fruits and Crops (HVFC) in Chittagong.

##### 1.2 Significance of the Study

Researchers identified that in Bangladesh only one third of the local fruits are available round the year, while three fourths of fruits are available for only three to four months of the year. So, it is very important that we must fill this

gap. The agriculture sector of Bangladesh has been in a process of transformation to commercial farming through modernization, the key theme of which is making the agriculture profitable that will enable the farmers to improve their living standards. However, HVFCs are at the centre of commercial farming, where educated youths can be involved and build their futures. It is hoped that the findings of the study will create some important insights and direction for the local farmers as well rural youths for their future career. We also hope that these will provide significant policy inputs to the policy makers.

### 1.3 Literature Review

There are very few studies found in the existing literature on the issue of high value fruits and crops production, extension, and marketing (HVFCEM) in the context of Bangladesh. Some of the studies collected from existing literature are briefly discussed below.

Kuma *et al.* (2019) <sup>[19]</sup> highlight from the Ethiopian context that high-value crops generate more revenue and have higher labor productivity compared to staple crops in smallholder, non-mechanized farming systems common in developing countries. Similarly, Zaman and Marma (2022) <sup>[32]</sup> report a significant rise in the commercial cultivation of high-value exotic fruits in Bangladesh—such as dragon fruit, avocado, and strawberries—due to their higher profitability. Haque (2022) <sup>[11]</sup> also highlighted that educated, unemployed youth in Bangladesh, particularly in the drought-prone Barind region, are becoming self-reliant by cultivating non-conventional high-value fruits and crops. The CDC (2022) study identifies key challenges in the high-value crop value chain in Palestine, including weak farmer organization, limited cooperative structures, and poor linkages with the private sector, all of which hinder input cost reduction, marketing, and policy support. Meanwhile, Cock and Jimens (2023) <sup>[7]</sup> emphasize the transformative potential of high-value crop products (HVCs) in boosting rural prosperity. They advocate shifting focus from staple crops to HVCs due to their higher income potential per unit of land and labor, which can effectively address poverty and food security challenges.

Rahim and Moniruzzaman (2023) <sup>[25]</sup> emphasize the need to boost high-value fruit exports in Bangladesh to meet global demand, noting that current exports remain low due to limited awareness and compliance with international standards. Masood (2023) <sup>[20]</sup> highlights the growing interest of youth in high-value crop farming, particularly fruits like dragon fruit and vegetables like capsicum, due to their significantly higher profitability compared to traditional crops. He also noted that HVFCs offer strong potential for income generation and commercial agriculture in Bangladesh.

Existing literature discussed above shows that production and marketing of HVFC is profitable and help creating employment opportunities for the rural poor. In this backdrop, this study tries to evaluate the impact of HVFCEM activities of YPSA implemented in Chittagong region on the creation of employment opportunities and generating income for the rural people as well opportunities of entrepreneurship development.

### 1.4 Conceptual and Analytical Framework of the Study

Entrepreneurship development is the process of equipping

individuals with skills, knowledge, and motivation to start and grow innovative and successful businesses. It involves training, guiding, and providing resources to enhance entrepreneurial capabilities, fostering a mindset of innovation and risk-taking (Audretsch & Thurik, 2000) <sup>[4]</sup>. The ultimate goal is to stimulate economic growth by increasing the number of sustainable businesses and creating jobs. By fostering a vibrant entrepreneurial ecosystem, entrepreneurship development contributes to job creation, wealth generation, and overall economic prosperity (Solomon, Duffy and Tarabishy 2002) <sup>[28]</sup>. Entrepreneurship can address social problems by creating solutions for unmet needs, promoting sustainable practices, and empowering marginalized communities, as well as can empower individuals to take control of their economic lives, pursue their passions, and achieve personal and professional fulfillment (Efe, 2014) <sup>[9]</sup>.

However, entrepreneurship development, employment creation, and income generation are intricately linked, with each playing a crucial role in economic growth and societal progress. Entrepreneurship fuels innovation by introducing new ideas, products, and services, which in turn creates new job opportunities (Nor, 2024) <sup>[22]</sup>. Successful entrepreneurship also leads to increased economic activity and national income. In essence, entrepreneurship acts as a catalyst for innovation, and both, in turn, are vital for creating new employment opportunities and fostering sustainable economic growth.

The above theoretical understanding of entrepreneurship development that are linked to employment, generation, innovation, income generation as well as reducing rural poverty is the analytical framework of this study. It is believed that if the activities of HVFCEM project of YPSA leads employment generation, income generation i.e entrepreneurship development it will ultimately enhance social progress and national economic growth.

### 1.5 Objectives of the study

The main aim of the study is to evaluate the impact of HVFCEM project on entrepreneurship development among the rural poor farmers in Chittagong region. The specific objectives of the study are set as follows:

1. To explore the rural employment and income generation opportunities through HVFCEM project;
2. To examine the impact of training on capacity building and entrepreneurship development through HVFCEM project;
3. To investigate the level of awareness about certification and commercialization of the business enterprises through HVFCEM project?
4. To examine the progress in the development of value chain activities; and
5. To explore the challenges of HVFCEM in order to forward some measures.

### 1.6 Scope and Limitations of the Study

The scope of the study was limited to the evaluation of the HVFC extension and marketing and some allied activities in the Chittagong region specifically Sitakund and Mrshorai. So the findings of the study may not be generalized. However, the study tried to get the real scenario of the issue so that some lessons can be forwarded. The duration of the study was very limited, as a result it was not possible to

include a large number of samples. However, the researchers tried their best to explore the issues efficiently.

## 2. Research Methodology

With a primary focus on qualitative methods for greater flexibility, deeper and comprehensive insights, and detailed description of phenomena, this study applied a mixed-method approach combining both qualitative and quantitative method to explore the objectives of the study. Applying this approach, the study tries to explore the real scenario of HVFC extension and marketing in Bangladesh with a special reference to YPSA initiatives in Chittagong. However, some quantitative data were collected to justify the qualitative findings. This study used both secondary and primary data for the attainment of the research objectives. For collecting secondary data, a list of existing research articles, survey reports and web sources on the topic HVFC were used. Collected documents were reviewed and analyzed accordingly.

Following Eisenhardt's (1989) note, depending on the research object, this study used a purposive sampling technique and consequently a list 60 respondents were selected from different categories of entrepreneurs based on their types of business for collecting primary data. The study had 60 interviews and 2 focus group discussion via a semi-structured checklist. The checklist focuses on some specific themes as per the objectives, such as: demographic information of the respondents; generation of rural employment and income; impact of training on HVFC; certification and commercialization of the businesses; level of satisfaction on the HVFC activities and challenges faced by the respondents, as well as ways forward. Sampling under qualitative research is mainly purposive and convenient. Collected qualitative data were thematically analyzed, and discussed while quantitative data were presented using SPSS tools such as tables, bar diagrams and figures as appropriate.

### 2.1 Study Area

The study area was the HVFC project implementation area of YPSA. The areas were Sitakund and Mirshari Upazila under Chittagong district. The following map shows the study area at a glance.

Different Villages / Unions of Sitakunda and Mirsarai Upazilla under Chattogram district.



Fig 1: Upazilla map of Mirsarai, Chattogram



Fig 2: Upazilla map of Sitakunda, Chattogram

Respondents from fourteen different villages of Sitakunda and Mirsarai upazila were interviewed. The selected seven villages under Sitakunda Upazila are: Kumira, Chowdhury Para, Bashbariya, Choto Daruga Hat, Muradpur, Sonaichari, and Bhatiyari; and selected seven villages under Mirsarai Upazila are: Wahedpur, Borotakiya, Idilpur, Hadi Fakir Hat, Uttor Talbaria, Doaji Para, and Rahmat Nagar.

## 3. High Value Fruits and Crops (HVFC): A Brief Discussion

High Value Fruits and Crops (HVFC) are agricultural products that have a higher market value compared to conventional crops. This is usually due to the fact that they are only cultivated in limited quantities or that they are suitable for specific purposes or high price market segments because of their unique characteristics and properties (Haque 2022) <sup>[11]</sup>. Examples of HVFC include special varieties of fruit and vegetables such as exotic varieties, herbs or rare varieties that command a higher price due to their unique taste, their colour or their nutritional value. Another important HVFC category is medicinal plants and herbs that are used in the pharmaceutical and cosmetics industries, for example cannabis. The technologies that are used in HVFC production may vary, depending on the plant species and the cultivation system. HVFC such as herbs, spices and lettuces are often cultivated in hydroponics and aquaponics, for instance, as these systems reduce the need for water and fertilizers and enable cultivation in limited spaces (Rahim and Moniruzzaman 2023) <sup>[25]</sup>.

HVFC have some advantages such as: they generate more revenue per unit land area than grain or basic staple crop, as well as, more output per unit labor input, labor productivity. They tend to be higher than that of the staple crops in traditional, and unmechanized production in the developing



nations. They ensure food security, diverse food markets, and resilient landscapes and make the rural communities more prosperous. They improve the livelihoods and well-being of rural communities, as well as, are potential to increase the availability of healthier foods, to provide a more diverse diet, and particularly with perennial, to contribute to more diverse, pleasant, and resilient landscapes. Moreover, this sector offers many employment opportunities not only in the primary production but also in the value added in the post-harvest handling and marketing; and opens the prospect of jobs for the landless labor, who are often the poorest of the poor, and the establishment of ancillary businesses that provide services and inputs along high value crop product value chains.

### 3.1 Types of HVFC in Bangladesh

In Bangladesh, several HVFCs are grown that contribute significantly to the economy, improve farmer incomes, and support rural employment. These crops and fruits are in high demand both domestically and internationally (CDC 2022). Here are some of the most notable high value fruits and high value crops in Bangladesh:

#### A. High Value Fruits

In Bangladesh, several high-value fruits are cultivated and valued both locally and for export. Key fruits include mangoes (especially varieties like Himsagar and Amrapali), pineapples from Chittagong and Cox's Bazar, guavas from Madaripur and Rajshahi, papayas from Khulna and Barisal, and citrus fruits such as lemons and oranges from Rangpur and Chittagong. Jackfruit, the national fruit, is widely grown across the country. Dragon fruit, though new, is gaining popularity in Sylhet and Chittagong. These are not only consumed domestically but are also exported to countries like the Middle East and Southeast Asia. Guava is another highly valued fruit in Bangladesh. Berries like strawberries and mulberries are also emerging in specialized farms (Haque 2022) <sup>[11]</sup>.

#### B. High Value Crops

Besides fruits, Bangladesh also cultivates several high-value crops including vegetables, flowers, and spices. Tomatoes and potatoes, mainly grown in Rajshahi, Dinajpur, and Barisal, are in high demand locally and internationally. Cauliflower and cabbage are also important for domestic markets and farmer income. Flower farming—especially roses, chrysanthemums, and lotus—is expanding in areas like Comilla and Chittagong. Spices such as chili, ginger, and turmeric are vital to both local cuisine and exports, with Bangladesh being a major producer, particularly in its northwestern and southern regions (IFAD 2022) <sup>[14]</sup>.

### 3.2 Impact of High Value Fruits and Crops (HVFC)

The cultivation of high-value fruits and crops (HVFC) in Bangladesh has notable economic, social, and environmental benefits. These crops, valued for their market demand and nutritional benefits, can significantly boost farmers' incomes, particularly in areas where traditional farming is less profitable. While HVFCs support rural prosperity and food security, they often require more resources and careful management compared to staple crops (Rahim and Moniruzzaman 2023) <sup>[25]</sup>.

The impact of high value crops and fruits in Bangladesh are briefly discussed below.

#### Boosts Economic Growth and Income

The cultivation of high-value fruits and crops (HVFC) in Bangladesh significantly benefits the economy and rural communities. It boosts economic growth and income through higher market prices, exports, and agro-processing industries. Bangladesh has seen increased export of HVFC to international markets like the Middle East, Europe, and the United States.

#### Promote Rural Employment

HVFCs also promote rural employment and improving livelihoods, by creating jobs in cultivation, harvesting, processing, and marketing, particularly for women and youth (Hossain 2019) <sup>[12]</sup>.

#### Enhance Agricultural Diversification

Agricultural diversification is enhanced as farmers shift from traditional crops to HVFCs, improving sustainability and reducing risks. Crop diversification also helps improving soil health, reduce pest and disease outbreaks, and make farming more sustainable.

#### Contribute to better Nutrition and Food Security

These crops contribute to better nutrition and food security for the nation by providing nutrient-rich foods particularly among the children and vulnerable populations.

#### Drives Market and Supply Chain Development

Additionally, HVFC growth drives market and supply chain development, leading to efficient agricultural supply chain, improved infrastructure and adoption of modern farming practices and technologies.

### 4. HVFCM in Chittagong: Role of YPSA

YPSA (Young Power in Social Action) is a non-governmental organization (NGO) that works on various development initiatives across Bangladesh, with a strong focus on rural development, health, education, and environmental sustainability (YPSA 2023). The HVFCM Project (High-Value Fruits, and Crops, Extension and Marketing) of YPSA in Chittagong is a significant initiative started in February 2022 aimed at improving the livelihoods of rural farmers through the promotion of high value crops, environmentally sustainable practices, and better agricultural techniques under the support of Rural Micro Enterprise Transformation Project (RMTP) of PKSf. It is to be noted here that the objective of RMTP is to extend financial services for micro-enterprises as well as for improving income, food security, and nutrition status of small and marginal farmers, entrepreneurs, and other market actors involved in the value chains of selected high-value agricultural products (PKSF 2023) <sup>[23]</sup>. However, the HVFCM Project of YPSA is a comprehensive program designed to address several challenges faced by rural communities in Chattogram. The project primarily focuses on increasing the production of HVFC while promoting environmental sustainability and improving the economic conditions of farmers, particularly in Chattogram region.

4.1 Key Components of the HVFCCEM Project of YPSA

The HVFCCEM project focuses on five key components:

- 1. **Promotion of High-Value Crops:** Encouraging cultivation of high-yielding, pest-resistant fruits and crops like mangoes, guavas, and spices.
- 2. **Environmental Sustainability:** Promoting eco-friendly practices such as organic farming, IPM, water-efficient irrigation, and composting to protect soil and reduce chemical use.
- 3. **Capacity Building:** Providing training in modern farming, post-harvest handling, and marketing, with special emphasis on empowering women.
- 4. **Market and Financial Access:** Strengthening market linkages and supporting farmers with credit access and value chain development to improve profitability.
- 5. **Gender and Social Inclusion:** Ensuring equal opportunities for women and marginalized groups in all project activities.

5. Data Presentation, Discussion and Analysis

The study check list was formulated based on the objectives of the study, as discussed earlier. However, collected data are presented below with the researchers own analysis and discussion accordingly.

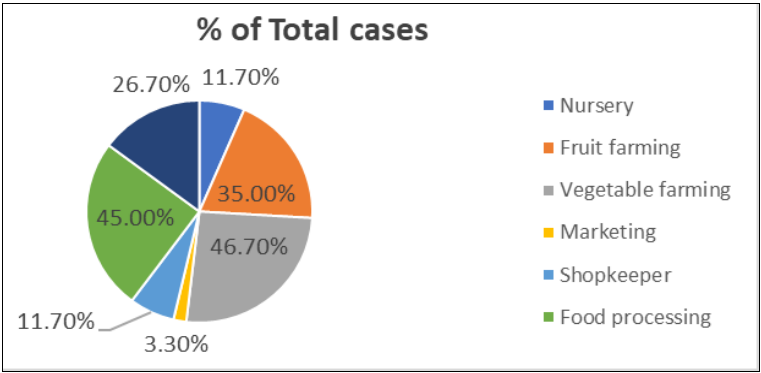
A. Respondents Gender and Age Group

Among the selected respondents for the study 73.3% were male and 26.7% were female which reveals that both male and female are involved in HVFCCEM. It is also found that the majority of the respondents (60.0%) is aged 36 and above, followed by 38.3% aged 26-35, and only 1.7% in the 18-25 age group which indicates that the people from older age groups are very much interested about HVFCCEM. Participants in the FGD claimed that most of the businesses are male dominated, and younger populations are less interested, although these are supportive to generate employment opportunities for the large young generation.

B. Education Level of the Respondents

The sample shows diverse educational levels, with the largest group being HSC (25.0%), followed by Below SSC (23.3%). Graduate level accounts for 15.0%, while Postgraduate is 8.3%. A notable 11.7% reported having no education, and 1.7% did not respond. This distribution highlights a broad range of educational backgrounds, though higher education levels are less represented in the project. Respondents in the FGD also mentioned that educated young group both male and female are less interested in these businesses.

C. Respondents Business Types



Source: Interview Data, December 2024

Fig 3: Respondents Business Types

Collected data shows that the majority of respondents are involved in vegetable farming (46.7%), food processing (45%) and fruit farming (35.0%), while 11.7% are involved in Nursery and the same in shop keeping. However, marketing is found the least represented business type, with only 3.3% of respondents.

Detailed information about the other types and categories of businesses were found in the FGDs, which indicates that mushroom farming, fish farming, handicrafts, organic fertilizer production, food processing such as cake making,

mixed fruits, jam and jelly making, etc. are some popular types of business. Moreover, respondents confirmed that, food processing is the business, dominated by the females while fruits and vegetable farming are dominated by the males. Apart from food processing and other business, rest of the types of businesses are all exclusively contained by the males.

D. Employment Generation through the HVFCCEM Project

Table 1: Employment Generation through the HVFCCEM Project

		Permanent employment generated	Temporary employment generated
N	Valid	42	51
	Missing	18	9
Mean		2.33	2.82
Median		2.00	2.00
Mode		1a	0
Std. Deviation		1.443	3.587
a. Multiple modes exist. The smallest value is shown			

Source: Interview Data, December 2024

The above data shows that on an average, each individual generated their own employment and 2 employment for others through their business enterprises. The data indicates the success of HVFC project in employment generation. The FGD data reveals that the nature of the employment generated by the participants was both temporary and permanent. The respondents confirmed that it is very vital that before involvement with the HVFC project they were unemployed but now they are employed permanently as

well as they have created employment for others in the community. So it can be said that the HVFC project of YPSA helped creating jobs for the rural poor, hence contributing to the reduction of unemployment rates in the country.

### E. Monthly Income Before and After Involvement with the HVFC project

**Table 2:** Monthly income before and after involvement of this HVFC business

	Mean	Median	Mode	Minimum	Maximum
Monthly income before in BDT	23050.00	20000.00	20000.00	3000.00	100000.00
Monthly income after in BDT	36833.33	30000.00	30000.00	5000.00	120000.00

Source: Interview Data, December 2024

The data shows that the mean income increases to BDT 36,833.33, suggesting a rise in income following the project. The range extends from BDT 5,000 to BDT 120,000, indicating a wider spread in income after the project. In summary, the income of the respondents after the involvement of the HVFC project shows a significant increase in both mean and median income, suggesting that the project has likely contributed to higher earnings.

### Here, we formed a pair of hypotheses

**H<sub>0</sub>:** Mean income is (statistically) same before and after the HVFC project.

**H<sub>1</sub>:** Mean income is (statistically) different before and after the HVFC project.

The FGD data also confirms that the income of the

respondents has increased significantly. Respondents who were unemployed earlier also opined that as they have started and successfully running their business with the support of HVFC project, they are earning now.

One of the participants said, “it is a matter of happiness that we are not only earning for ourselves, we are helping other people who were also unemployed earlier, but now working in our business enterprises and earning that support their livelihood expenses”.

It indicates clearly that the respondents businesses under the HVFC project are successful and supportive to generate income for them.

### F. Paired Sample t test to Check the Significance of Income Increase

**Table 3:** Paired Sample t test to Check the Significance of Income Increase

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Monthly income before Monthly income after	- 13783.33333	12594.17631	1625.90117	-17036.75406	-10529.91261	- 8.477	59	.000

Source: Interview Data, December 2024

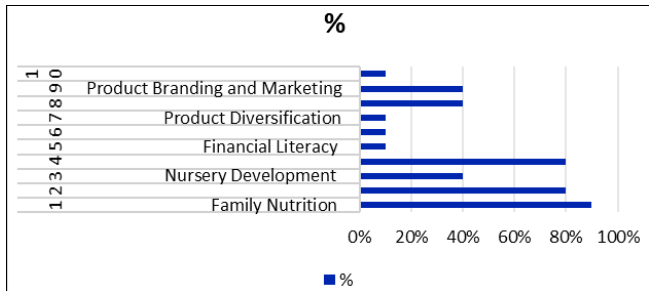
The above data shows that as p value is less than 0.01, at 1% level of significance, we reject the null hypothesis and conclude that the increase in average income after the involvement with the HVFC project is statistically significant.

### G. Types of Training Received by the Respondents

However, the quantitative data shows that most of the respondents participated in the training courses on family nutrition (54), organic farming (47), and entrepreneurship development (40), and these three make the combination with highest participants in training courses offered by YPSA under HVFC project. Some of them also enrolled for the training courses like product labeling and packaging (30), product branding and marketing (30), while financial literacy training, healthy work environment creation training, product diversification and development of backward linkage businesses had the lowest participation (5). It indicates that participants were not that much

motivated to be trained in diversified courses necessary for the growth of their businesses.

The following table shows the data in details.



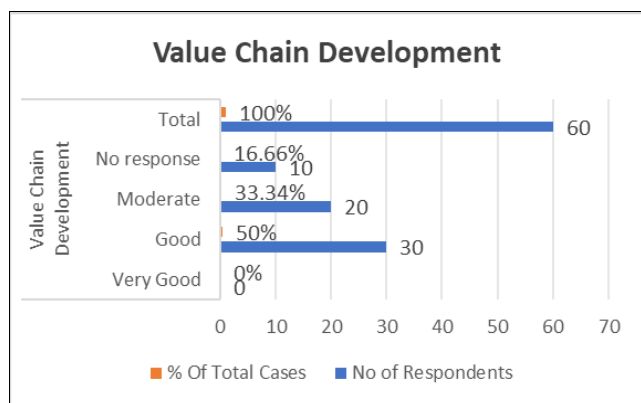
Source: Interview Data, December 2024

**Fig 4:** Types of Training Received by the Respondents

FGD data also confirms that some entrepreneurs are ignorant about enrolling in different training courses though

they are aware about the benefits of those training courses.

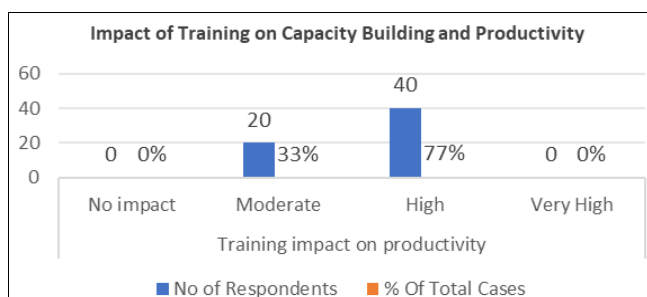
## H. Value Chain Development



**Fig 5:** Value Chain Development

Most of the respondents (50%) rated the value chain development activities as 'good' while only one third (33.34%) rated moderate, while only 16.66% had no response, indicating mid level of satisfaction. FGD data confirms that the respondents received different types of value chain development training such as packaging and leveling, storage, transportation and marketing and promotion etc. And they are happy with the support given by YPSA under the HVFC project to be involved with the different value chain development activities. However, they opined that there is still scope for development of value chain activities in future.

## I. Impact of Training on Capacity Building and Productivity



**Source:** Interview Data, December, 2024

**Fig 6:** Impact of Training on Capacity Building and Productivity

77% of the respondents reported high productivity impact from the training they received, while 33% mentioned moderate level of productivity. The data indicates the effectiveness of training sessions in improving outcomes. However, in the FGD, participants confirm that after receiving different training on HVFC by YPSA the productivity level becomes high. They also opined that the training sessions were very effective for them. As a result the growth of their business is satisfactory.

## J. Awareness and Use of Organic Technology based Farming after Training

The participants confirm that during training sessions they were informed about the importance and use of organic

technology in the agricultural sector. They were also informed about the practice of organic farming. The respondents mentioned that they are happy to know the benefits of organic fertilizers which are environment friendly and less costly. Some mentioned that they were also given ideas about modern irrigation facilities. These all gave them an opportunity to be involved with the organic technology based farming.

Name of organic technology used by the respondents as identified in the FGD are grass cutter machine, pheromone trap, bio pesticide, bio fertilizer, fruits bag, mulching, lure, power tiller, barmy compost fertilizer, colour trap, light trap, yellow trap, etc. as well as, modern irrigation. They also mentioned that due to their awareness and training on organic farming their businesses have become sustainable and profitable. It is very significant to know that they are now trying to involve local people to use organic technology and organic farming practices who were not under the project.

## K. Awareness about Family Nutrition

**Table 4:** Awareness about family Nutrition

		No of Respondents	% of Total Cases
Awareness about family nutrition after project	No Response	4	6.7%
	No impact	0	0.0%
	Medium	4	6.7%
	High	33	55.0%
	Very High	19	31.7%

**Source:** Interview Data, December 2024

The majority (86.7%) reported significant awareness of family nutrition after the training, with "High" (55.0%) and "Very High" (31.7%) being dominant. Only 6.7% gave no response, indicating overall strong engagement.

## K. Creation of New Varieties after Training

During FGD the respondents agreed that they are in a position to create new crop varieties after the training they received from YPSA under HVFC project. This clearly demonstrates the innovation fostered by the program. Different crop varieties the respondents created are: coloured cauliflower, beetroot, onion, melon, spice, sweet tamarind, honey, seasonal agriculture, coffee, rambutan, cashew nut, avocado, beetroot, vermin compost, soya seed, guava, lotkon, mango, jackfruit, orange, papaya, black pepper, dragon fruit, capsicum, chili, brinjal, peas, banana, pumpkin, plum, coriander, and corn etc. as they mentioned during FGD.

## L. Maintaining Hygiene and Personal Safety Measures

**Table 5:** Maintaining Hygiene and Personal Safety Measures

		No of Respondents	% of Total Cases
Maintain hygiene and personal safety now	No Response	10	16.7%
	No	0	0.0%
	Yes	50	83.3%

**Source:** Interview Data, December 2024



An impressive 83.3% of respondents reported maintaining hygiene and personal safety measures, reflecting the program's emphasis on integrating health considerations into

agricultural practices.

**M. Organic and Chemical Fertilizer Usage**

**Table 6:** Organic and Chemical Fertilizer Usage

	Mean	Mode	Median
Percentage use of organic fertilizer before training	45	40	40
Percentage use of organic fertilizer after training	57	60 <sup>a</sup>	60
a. Multiple modes exist. The smallest value is shown			

Source: Interview Data, December 2024

To understand whether the proportion of organic & chemical fertilizer usage has significantly improved or not, we form a pair of hypotheses:

**H<sub>0</sub>:** No significant difference between mean percentage of organic fertilizer usage before & after training.

**H<sub>1</sub>:** There is significant change observed after the training.

**N. Organic Fertilizer usage before and after Training (Paired sample t test)**

As the p value is less than 0.010, at 1% level of significance, we reject the null hypothesis and conclude that organic fertilizer usage proportion has significantly increased after the project, which indicates a development of more eco-friendly farming habits influenced by HVFC project.

**Table 7:** Organic Fertilizer usage before and after Training (Paired sample t test)

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Percentage use of organic fertilizer before training Percentage use of organic fertilizer after training	-11.857	20.439	3.455	-18.878	-4.836	-3.432	34	.002

Source: Interview Data, December 2024

**O. Current Health Condition after Using Organic Technology**

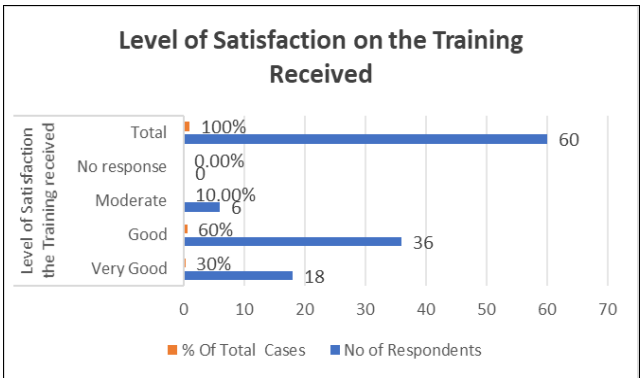
**Table 8:** Current Health Condition after Using Organic Technology

Current health after using organic tech	No of Respondents		% of Total Cases	
	No Response	18	30.0%	
	Bad	0	0.0%	
	Moderate	1	1.7%	
	Good	22	36.7%	
	Very Good	19	31.7%	

Source: Interview Data, December 2024

Over 68.4% of respondents rated their health as "Good" or "Very Good," suggesting a positive correlation between organic practices and perceived health benefits.

**P. Satisfaction on the Training Received by the Respondents**



Source: Interview Data, December, 2024

**Fig 7:** Level of Satisfaction on the Training Received

**Q. Nature of Employment Generation through the HVFCM Project**

The following table shows that on an average, each individual generated their own employment and 2 employment for others through their business enterprises. The data indicates the success of HVFCM project in employment generation. The FGD data reveals that the nature of the employment generated by the participants was both temporary and permanent.



The respondents confirmed that it is very vital that before involvement with the HVFC project they were unemployed but now they are employed permanently as well as they have created employment for others in the community. So it can be said that the HVFC project of YPSA helped creating jobs for the rural poor, hence contributing to the reduction of unemployment rates in the country.

**Table 9:** Nature Employment Generation through the HVFCM Project

		Permanent employment generated	Temporary employment generated
N	Valid	42	51
	Missing	18	9
	Mean	2.33	2.82
	Median	2.00	2.00
	Mode	1a	0
	Std. Deviation	1.443	3.587
a. Multiple modes exist. The smallest value is shown			

Source: Interview Data, December 2024

### R. Awareness about Certification and Commercialization of Business

The study data shows that trade licenses were the most common certification (70%), followed by trademark certification (30%), BSTI certification (10%), and hygiene certification (10%) which indicates their ignorance about the certification and commercialization of their businesses.

However, the participants during FGD confirmed that they are aware about certification and its impact on commercialization of their businesses. Hence they have been trying to get different certification for their businesses. But, it is revealed from the discussion that maximum participants mainly go for only trade licenses, though they were given awareness about the importance of other types of certification/licenses which are important for the smooth operation, commercialization and profitability of their businesses. It indicates that they are ignorant about other types certification. It is also revealed that they know about the benefits of other types of certification such as trademark certification, BSTI certification, hygiene certification, etc., but somehow they ignore those.

### S. Product Quality, Demand and Sustainability of Business after Certification

Most of the respondents (70%) rated the quality of their products as very good which indicates their high self assessment about the product quality. Moreover, all the respondents (100%) agreed that certification increased their product demand, highlighting its positive impact on market appeal and commercialization of their businesses. However, those who were fully certified, were each confident about the sustainability, growth and profitability of their business.

### T. Type of Challenges Faced by the Respondents

The participants in the FGD mentioned many challenges. While asking about the top seven challenges being most faced by them, they confirmed that, the most important challenges are 1) lack of transportation support, 2) lack of

promotion and advertisement, 3) lack of financial resources, 4) lack of marketing and sales facilities, 5) lack of appropriate packaging and leveling facilities, 6) lack of advanced storage facilities, and 7) lack of availability of raw materials. They focused on mitigating these challenges so that they can smoothly operate and make their businesses sustainable and profitable.

### U. Overall Satisfaction on the Effectiveness of HVFCM Project

The participants during FGD confirms their high level of satisfaction on the effectiveness of HVFC production and extension project. They specifically mentioned that after the involvement with businesses under the HVFC project they are now employed and financially solvent. They are able to provide education, health support and other important livelihood support to their family members. They are very much aware about the negative impact of chemical fertilizer to the environment used by the other people in traditional farming. It is worth mentioning that every single individual participant mentioned that the project should be continued to the other areas of Chittagong, in order to increase and popularize organic technology based farming practices among the traditional farmers. Nonetheless, expansion of the project might be a right decision.

### V. Ways Forward to Face the Challenges

The participants ranked and proposed some ways to face the challenges. Making financial resources available and accessible was ranked first, followed by making advanced storage facilities available and easily accessible, ensuring appropriate packaging and leveling facilities, making raw materials locally available with low cost, ensuring marketing and sales facilities, facilities for the promotion and advertisement of their products, and ensuring transportation facilities.

The FGD data focused more on value chain facility development activities. More specifically, they also focused on creation of skilled labour, production of raw materials locally, tax free mulching, marketing and promotion facilities of their products, availability of fine seeds, availability of raw materials at the lower price, availability of transportation facilities, and availability irrigation facilities.

### 6. Summary of the Major Findings

The summary of the major findings are described below following the specific objectives:

#### Gender and Age Group in HVFCM Project

The HVFC business is dominated by the males although both the males and females are involved in HVFCM project. It is also revealed that the people from older age groups are very much interested about HVFC business, while younger populations are less interested, where as this group belongs to almost one third of the national population.

#### Educational Background and Types of Business

People from a broad range of educational backgrounds are involved on HVFC business, though higher education levels are less represented. Food processing is the business, dominated by females while fruit farming and vegetable

farming are dominated by the males. However, apart from food processing, rest of the types of businesses are all exclusively contained by males. Vegetable farming and food processing are found most popular business, while marketing is found the least represented business type.

### **Rural Employment Opportunities**

Respondents are able to generate employment for them as well for others both permanent and temporary. It indicates the role HVFC businesses in job creation and promoting economic opportunities.

### **Impact on Income Generation**

The income after the engagement with the HVFC project has likely to contribute to higher earnings. Moreover, the increase in average income after the project is also found statistically significant.

### **Types of Training Received by the Respondents**

The most enrolled training courses are Entrepreneurship Development, Organic Farming and Family Nutrition. Other types of training they received are: product labeling and packaging, product branding and marketing, financial literacy training, healthy work environment creation training, product diversification and development of backward linkage businesses had the lowest participation etc. But these training were less enrolled though these are very important for any type of business.

### **Value Chain Development**

The development of value chain activities specifically, packaging and leveling facilities, storage facilities, transportation support and marketing and promotion is not very much satisfactory. So there are scopes for development of value chain activities in future.

### **Impact of Training on Capacity Building and Productivity**

The level of productivity and capacity building becomes high after receiving different training on HVFC. The training courses were effective for them. As a result the growth of their business is satisfactory.

### **Awareness about Family Nutrition**

The respondents have gained strong awareness on family nutrition through the training. That indicates the success of the training provided by YPSA. They are now aware about the nutritious foods for their family members.

### **Awareness and Use of Organic Technology based Farming**

The respondents have achieved an understanding of the organic technology based farming and its practices, but they are moderately using organic and technology based farming.

### **Creation of New Crop Varieties after Training**

The respondents created new crop varieties after training that demonstrates the innovation fostered by the program.

### **Maintaining Hygiene and Personal Safety Measures**

The respondents are maintaining hygiene and personal safety measures as they have known the benefit of hygiene and personal safety measures during training session,

reflecting the program's emphasis on integrating health considerations into agricultural practices.

### **Organic Fertilizer usage before and after Training**

The findings confirms that the proportion of organic fertilizer usage has significantly increased after the training they received, which indicates a development of more eco-friendly farming habits influenced by HVFC project. It is also found that the health conditions of the respondents are very good although they are using organic fertilizer, suggesting a positive correlation between organic practices and perceived health benefits.

### **Current Health Condition after Using Organic Technology**

Most of the respondents rated their health as "Good" or "Very Good," suggesting a positive correlation between organic practices and perceived health benefits.

### **Satisfaction on the Training Received**

The overall satisfaction level of the respondents on the training on HVFCM is very high, indicating that the different types of training on HVFC Extension and Marketing provided by YPSA were effective and worthy.

### **Certification and Commercialization of Businesses**

The awareness about the certification and its impact on commercialization of their businesses is not highly satisfactory though they were given awareness about the importance of different types of licenses which are important for the smooth operation, commercialization and profitability of their businesses.

### **Products Quality and Sustainability of Business after Certification**

Certification of business increased their product quality and demand in the market as they maintain the certification rules. Hence businesses of the respondents who were conscious about all the certifications become sustainable and profitable.

### **Challenges of HVFCM Project**

The top seven challenges as identified by the participants are: 1) lack of transportation support, 2) lack of promotion and advertisement, 3) lack of financial resources, 4) lack of marketing and sales facilities, 5) lack of appropriate packaging and leveling facilities, 6) lack of advanced storage facilities, and 7) lack of availability of raw materials.

### **Overall Satisfaction and Continuation of the HVFCM Project**

The overall satisfaction level on the effectiveness of HVFCM project is predominantly positive, indicating high levels of satisfaction. They mentioned to continue and expand the project to the neighbouring areas in Chittagong.

### **6.1 Ways Forward**

The cultivation of HVFC in Bangladesh is increasing which is a key driver of rural employment, income generation and overall economic development. However, to fully capitalize these benefits, there must be continued attention to the sustainability of the HVFC related businesses. The study

identified some important insights that must be addressed in an appropriate manner. So that the HVFC and related sectors may contribute to the economy of Bangladesh as it is found the study area. However, some of the specific recommendations based on the solid evidences stated above are as follows:

#### **Promotion of HVFCM among the Youths**

The representation of young age group into HVFCM was found not up to the mark in the study areas. Whereas this age group belongs to almost one third of the national population. So, specifically educated unemployed youths both male and female should be encouraged and engaged more and more to this businesses. Youths are more innovative and creative than the older age group. So, concerned authorities must take rigorous awareness activities on the HVFCM to the unemployed youths, specially educated youths, so that they are aware about the benefit and contribution of this sector to the economy and involve them.

#### **Providing Enough Financial Supports**

The HVFC entrepreneurs should get enough financial supports from the banks, MFIs and other NGOs working on financing. Because, many farmers face difficulties in accessing affordable credit to finance the high initial costs of HVFC production. This limits their ability to invest in the required technologies and inputs needed to increase yields and quality.

#### **Providing Financial Literacy Training**

Financial literacy training is a must for all the entrepreneurs who run any business. Therefore, the concerned authority should focus more on motivating the HVFC producer and entrepreneurs into this training for the growth and sustainability of their businesses.

#### **Promoting the Use of Organic Technology Based Farming**

Promotion of the use of organic technology and organic method of production is a must. So, these should be made available at the lowest cost to the farmers, such as modern drip irrigation systems and high-quality seeds.

#### **Focus on Certification for Commercialization of Businesses**

All types of certification based on the nature of business is a must. So, more focus should be given on building awareness about taking all the certification to the entrepreneurs for running their business smoothly, which ultimately create a good reputation and commercialization of their businesses hence make them profitable and sustainable in the long run.

#### **Adequate Storage Facilities**

One of the most important problems identified in the study is the lack of sufficient cold storage and warehouses facilities for HVFC farmers. Without adequate storage facilities, especially for perishable crops like mango, papaya, and vegetable farmers are forced to sell their produce quickly at the lowest price or face spoilage. So these facilities should be available at an affordable cost.

#### **Ensuring Packaging and Labeling Facilities**

Packaging and appropriate labeling is very important for the promotion of any products. It attracts the customer easily. Therefore, it is very important for ensuring packaging and labeling for the products of the entrepreneurs as appropriate.

#### **Ensuring Locally Available Raw Materials at low Cost**

Raw materials are found costly and not locally available. They should be available for the entrepreneurs locally at a lower cost. Initiatives can be taken to produce those locally for the entrepreneurs. It will help the entrepreneurs to compete with the competitors.

#### **Transportation Support**

The transportation system, especially in rural areas, is underdeveloped as identified in the study, which results in increased transportation costs and delays in products delivery. Although there are some supports for the entrepreneurs such rickshaw van, they are not enough. The HVFC entrepreneurs should be given easy and affordable transport facilities so that they can shift their products from the garden to the market easily.

#### **Promotion and Marketing**

Promotion and marketing of HVFC products facilities should be enhanced. Specifically, strengthening ties with local and international markets can help farmers secure better prices profitability and stability of their businesses.

#### **More Focus on Value Chain Development**

More focus should be given on the development of value chain activities in the project areas. So that local entrepreneurs as well as others can be engaged with those activities that will foster more employment generation and promotion of HVFC businesses.

#### **Expansion of HVFCM Project**

Overall, the HVFCM project found successful in the study areas, although some challenges are still there. However, it may be extended to the other parts of Chittagong division as well government may replicate the program into other places of the country.

#### **6.2 Concluding Remarks**

Structural changes in domestic food demand in Bangladesh are providing huge opportunities both on and off, of the farm for HVFC and related agribusiness. As a result of sustained economic growth, rising incomes, and rapid urbanization, widespread shifts have occurred in consumer food demand. In particular, consumers are buying more high value foods such as fish, meat, fruit, vegetables, and processed products. The growing domestic demand for HVFC could provide significant opportunities for greater rural employment and incomes as production of many of these commodities tends to be relatively labor intensive.

This study explores that there are huge potentials of HVFCM project in developing entrepreneurship among the rural poor in the study areas. The findings show that almost all the respondents were overall satisfied on the initiatives taken by YPSA under HVFCM project to aware the participants about the nutritious value of HVFC, awareness about the environmental impact, awareness about

the bad impact of using chemical fertilizer, benefits of using organic fertilizer, benefits of using organic technology in cultivation, creating new and innovative varieties of fruits and crops, impact of marketing, accounting and financial management, overall entrepreneurship development. After the engagement with the project the respondent's skills on the production, extension and marketing HVFC have increased. However, still there are some challenges being faced by the entrepreneurs.

It is said that HVFC products are highly perishable and require more sophisticated post harvest handling and efficient marketing systems. However, in the absence of well functioning marketing systems, the cost and quality of many HVFC products may not be competitive when compared to imports. Therefore, although expanding domestic demand presents significant opportunities, a strategic approach is needed to take advantage of prevailing opportunities.

Despite growing domestic consumption of fruits and vegetables, the production, processing, and marketing of fruits and vegetables have suffered, as because improvements in productivity, post harvest technology, and infrastructure for the domestic market have been greatly neglected. As the HVFC production is growing, it is very important that modern organized fruits and vegetables processing sector should be focused. In Bangladesh, most of the fruits and vegetables are still consumed fresh. Prospects for value addition in the domestic market through processing fruits and vegetables seem favorable as incomes continue to grow, but power and water supplies must become more reliable for this industry to expand and become competitive. The variable performance of Bangladesh's fruit and vegetable exports is unlikely to improve unless specific steps are taken to ensure long-term growth.

As this study explores huge prospect for value addition in fruits and crops production in Bangladesh, government and others concerned related to this sector need to think in an appropriate manner in order to get maximum benefit of this sector in future. Because, HVFCM creates employment, and generate income that are intricately linked to entrepreneurship development, with each playing a crucial role in economic growth and societal progress. It is hoped that the recommendations suggested here in this study may provide some important insights to the concerned for the betterment of this sector in future.

### 6.3 Contributions of the Study

The study may have contributions to both the academia and the policy makers.

#### Contribution to the Academia

It is hoped that the study findings may create new knowledge on the issue of HVFC extension and marketing in Bangladesh, hence may contribute to the academia. The findings proved that HVFCM may create huge employment opportunities to the unemployed rural people both male and female.

#### Contribution to the Policy

The findings may also have positive inputs to the policy makers as well as others concerned. The discussion,

analysis, findings, and recommendations may provide new policy inputs to the government and others concerned for future endeavour.

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