



## Research Article

## Impacts of a Packing House on the Export of Fresh Fruits and vegetables from Bangladesh to European Countries

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## ABSTRACT

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Agriculture is one of the most potential export sectors of Bangladesh. With a view to unleashing the potential, a packing House named the Central Packing House was established by the Department of Agricultural Extension in 2017 at Shyampur, Dhaka. This study was conducted to assess the impact of the packing house on the export of fresh fruits and vegetables from Bangladesh to European countries. It was observed that the number of noncompliance cases from the importing European countries experienced a sharp downfall starting from 153 in 2015-16 to 61 in 2022-23. As a result, there was an overall magnificent development of the scenario. It was found that the center started with seventeen agricultural products destined to four countries only, which extended to 103 items and 13 countries in seven years only. The beginning rate of exportable items, the amount of export and earning of foreign remittances climbed up to 83%, 6836.32 metric tons and 25,08,000 USD from 50%, 1000 metric tons and 10,14,000 USD respectively from the commencing years.

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## Introduction

Bangladesh has made remarkable progress in the agricultural sector over the past few years. The country's fertile land, favorable climatic conditions and proper policy support by the government have created enormous opportunities for agri-business. With increasing demand for high-quality agricultural products in international markets, Bangladesh has great potential to boost its Agri-export earnings (Rana, 2023). For exporting fresh fruits and vegetables, the production of good quality products by ensuring proper phytosanitary activities is an inevitable condition. To do so, a packing house adorned with phytosanitary facilities is ensured across the globe generally. Despite that, the exporters had been processing their products in their own godowns lacking the minimum facilities of sorting, grading, packing, washing, treating, cooling and drying in Bangladesh. Further, there was no structured and

official system of farming for producing the items in the light of internationally acceptable standard phytosanitary measures. As a result, product quality and phytosanitary declaration of the Department of Agricultural Extension (DAE) was not complying with the demands of the importing European Countries frequently. Between 2011 and 2014, the European Union detected harmful organisms in 270 consignments from Bangladesh. For instance, in February 2014, the EU suspended imports of betel leaves for bacterial contamination. Subsequently, the EU, one of the major markets for Bangladesh's \$209-million fruit and vegetable export industry, fired off a warning that failure to ensure pest-free exports and genuine phytosanitary certificates would lead to the consignments being banned from entry. The country's agricultural export being largely dependent on the

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European market, the Government of the People's Republic of Bangladesh decided to build a packing house to ensure safety, good quality, and uninterrupted shipment of fruits and vegetables (Parvez, 2015). As a result, the Central Packing House was established by the Department of Agricultural Extension in 2017 at Shampur, Dhaka. However, a little is known about the impact of the packing house on the export of fresh produces from Bangladesh to the targeted European

market. Therefore, present study was designed to know the effect of different systems, approaches, practices and activities of the center on producing exportable items, maintaining freedom from pests and unwanted pesticide residues, declining noncompliance from the importing countries, increasing the number and amounts of exportable produces, and ensuring the earning of foreign remittances from the exports.

**Table 1. Major crop-growing areas**

Serial Number	Produce	Upazilla	District
01	Colombo lemon, Beans, Teasle gourd, Jute leaves, Snake gourd	Sadar, Belabo, Raipura,	Narsingdi
02	Bottle gourd, Indian spinach, Sponge gourd, Ridge gourd	Sonargaon	Narayangonj
03	Jara lemon, Hot chilli, Country Bean, Sweet gourd	Jaintapur, Golapgonj, South surma	Sylhet
04	Bottle gourd, Stolon of colocasia, Amaranthus, Colocasia leaves	Moynamoti, Chandina	Cumilla
05	Mango	Symnagar, Sadar, Kolaroa, Shivgonj, Sapahar, Bagha	Satkhira, Chapainawabgonj, Naogaon, Rajshahi
06	Betel leaves	Sadar, Mirpur, Horinakunda	Kustia, Jhenaidah
07	Green chilli	Gabtali,	Bogra

## Materials and Methods

### Data Collection

Primary data were analyzed from the records kept by the Central Packing House, Plant Quarantine Wing, Department of Agricultural Extension. Some secondary data were collected from the Bangladesh Bank, the European Commission, and the Department for Environment Food & Rural Affairs (DEFRA) of the United Kingdom. Therefore, the authors used both the primary and secondary methods of data collection.

### Mapping of production site

The major crop-growing areas (Table 1) are selected based on agroecological zone, soil history, soil character, availability of fresh irrigation water, low pest prevalence, comparative facilities of control measures, availability of communication & other resources for having healthy products for exportation. Officials of the Plant Quarantine Wing-Head Quarters and Central Packing House perform regular surveillances for monitoring the presence of pests, especially quarantine pests at the production sites and their vicinities.

### Selecting Farmers

Farmers are selected based on their prudence, self-motivation, farm size, awareness of modern good agricultural practices, and commitment to producing safe food. Later, 12-20 farmers form a farmers' group

that becomes contracted by the exporters and is given individual identifying codes. For instance: the "DCHJS" code is allocated for a farmer where "D" stands for the group, "C" represents the produce (*Capsicum frutescens* L.), "H" indicates the farmer's name (Harunor Rashid), J symbolizes the Upazila (Jaintapur), and "S" mentions the district (Sylhet). The whole process is monitored and facilitated by the Department of Agricultural Extension (DAE).

### Establishing Good Agricultural Practices (GAP), keeping records and ensuring traceability

Farmers are trained in production, intercultural operations, eco-friendly and integrated pest management practices, pre-harvest intervals (PHIs), collection, sorting, grading, and other post-harvest practices of the specified crops. They maintain a "farm record-keeping book" illustrating every action related to the farms. Local office of the Upazila Agriculture Officer and employees of the Central Packing House, Shampur, Dhaka, monitor the whole process of farming rigorously. Afterwards, the concerned Upazilla Agriculture Officer confirm the GAP of the farms emphasizing on the freedom of the products from any pests and hazardous pesticide residues, and provides traceability reports for the products. After performing primary sorting, grading, washing, drying, and other post-harvest activities at the production sites, the fresh

fruits and vegetables are transported to the center in plastic crates accompanied by the given reports.

#### Export processing & other Phytosanitary activities at the center

##### Deployment of trained manpower

A dedicated team of officials are deployed for export control in order to meet the requirements of the importing countries. From time to time, in-house and hands-on training on identification of pests, sorting, grading, treating and packaging are imparted to the dedicated packers' team also.

##### Pre-inspection

To avoid entry of heavily infested produce in to the processing area, officials from the dedicated team ensures preliminary inspection of consignment on arrival in holding area of the pack house.

##### Processing

After pre-inspection, good quality produces go through a series of activities performed by well-trained packers of the exporting companies. Firstly, the products are sorted and graded based on their appearances, sizes, shapes, colour, deformities, and presence or absence of pests. Later, the exportable items undergo a rigorous washing with clean water, adequate air-drying and necessity-based cooling. Various phytosanitary treatments are conducted in the center as per requirements of the importing countries. For instance, citrus fruits exported to European countries are treated with 2.3% sodium orthophenyl phenate for ensuring freedom from pathogens, especially citrus canker (EU, 2019). Mangoes are treated with hot water (55°C) for 5 minutes with a view to ensuring freedom from post-

harvest diseases, Betel leaves are sanitized with calcinated calcium three times to eliminating contamination from *E. coli* AND *Salmonella spp.* (Islam et al., 2024) and so on. Further, the processed products are packaged in ventilated corrugated fiberboard cartons (CFC) for protecting their contents from mechanical damage due to drops, impacts, vibration, and compression loads (Pathare and Opara, 2014), and retain the beneficial effects of processing including extended shelf-life, maintained or increased quality as well as safety of food (Marsh et al., 2007). The whole process is meticulously monitored and controlled by authorized personnels of the packing house.

##### Final inspection & sampling

##### Inspection

Finally, the ready to export items are gathered at the landing space. Later, they are sampled and inspected in line with ISPM 23 for common pest and disease symptoms such as honeydew, sooty mold, webbing, chewed commodity, rot, soft spots, holes, stings, speckling on the leaf or blemishes on product, uneven yellowing of leaf or spots on product, rolled leaves, leaf spotting, water-soaked areas, powdery appearance, galls, soil and so on. The entire surface area of each product is inspected by visual/ magnoscopic examination and the suspected units are cut open for further investigation. The commodities bearing leaves, stem and calyx are examined on both upper and lower surfaces. This sampling and inspection process is also applied to fresh cut flowers.

##### Sampling methodology

The samples are drawn randomly as per ISPM 31 and Plant Quarantine Rules 2018 (Table 2).

**Table 2. The sample regime for the packages/boxes**

Total no. of Packages/boxes in a lot	No. of packages/boxes to be sampled
Up to 10	All
11 to 50	Minimum 10 nos.
51 to 100	Minimum 15 nos.
101 to 200	Minimum 20 nos.
201 to 400	Minimum 30 nos.
401 and above	Minimum 40 nos.

##### Handling of suspected pests and their detection

During inspection, live adults of harmful organism and its immature stages from the surface of the commodities are collected in glass vials with 70 % alcohol. Suspected commodities with internal feeder such as fruit flies, fruit borers, seed borers or their eggs as well as presence of harmful pathogen are also collected in self-locked polythene bags and sent to laboratory for further investigation.

##### Documents check

Following ISPM 23, various export documents including import permit, trade license, business identification number certificate, tax identification number certificate, invoice, export registration certificate, export permission certificate, membership of export promotion bureau, certificate for export of horticultural crops, traceability report, field inspection certificates, inspection reports, laboratory reports, etc. are checked

for ensuring their completeness, consistency, accuracy and validity.

#### *Issuing certificate*

Based on exportability of the produces, confirmed treatments, satisfactory inspection as well as investigation reports and compatibility of the submitted documents, Central Packing House certify compliance of plants, plant products and other regulated articles with the phytosanitary import requirements of importing parties as well as their freedom from regulated pests following Plant Quarantine Rules (2018).

#### *Sealed transportation and shipment*

After Phytosanitary certificate having issued, the consignments are loaded in cooling vans, sealed by the center and sent to Hazrat Shah Jalal International Airport. An employee of Central Packing House, breaks the seal at the airport premises and the shipment starts flight-proceedings.

### **Result and Discussion**

#### *Exportable item production*

Due to poor farming practices, unawareness of exportable quality of fresh fruits and vegetables, ineffective pest control techniques, improper post-harvesting management strategies, unskilled sorting, grading and inappropriate transportation systems, the quality of the products entering the center was very unsatisfying. For instance, in 2017-18, an amount of 2000 metric tons of the products were brought to center for export but only 50% of the produces indicating an amount of 1000 metric tons was exported. Later on, the quality of the produces increased exponentially because of the adoption of low or no pest prevalent contract farming areas, training the farmers on the good agricultural practices, inclusion of various efficient and eco-friendly pest management practices, application of various traps and baits, use of numerous botanicals and organic pesticides, and establishment of modern cultural practices. As a result, in 2019-20 and 2020-21, despite the total amount of export being decreased due to Covid-19 instances, the percentage of product exported from the amounts of products entering the center increased significantly by 62.56% and 68.47% respectively. Further, the trend continued to lift uninterruptedly and ended with 83% in 2023-24 (Fig. 1).

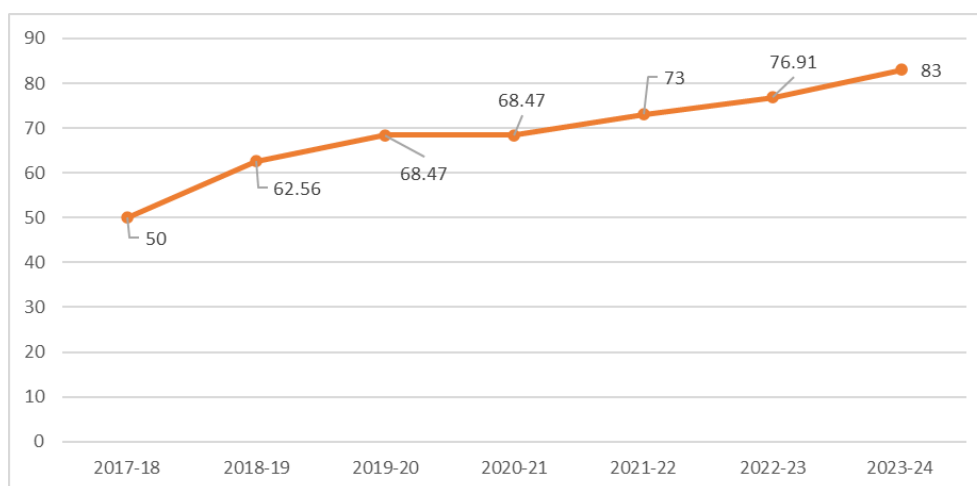


Fig. 1. Percentage of the products exported from the primary products (%)

#### *Amount of export*

Bangladesh exports various fresh fruits and vegetables remarkably Mango, Zara Lemon, Guava, Jackfruit, Litchi, Country beans, Green Papaya, Bottle gourd, Taro, Green chili and Leafy vegetables to thirteen European countries where the United Kingdom shares about 50% of the overall export solely. Other remarkable countries are Italy, Germany, Sweden and Ireland which share about 30% of the total exports collectively. The Central Packing House started its export in May/2017 and

exported a volume of 1000 metric tons including 400 metric tons of fresh fruits and 600 metric tons of fresh vegetables. Later, the proper processing of the items including sorting, grading, packaging, washing, drying, phytosanitary treatments, cooling; proper inspection and maintenance of proper phytosanitary measures, the export was sky-rocketed remarkably. It is shown that the total export in fiscal year 2023-24 was 6836.82 metric tons which is more than six times of the beginning amount (Fig. 2).

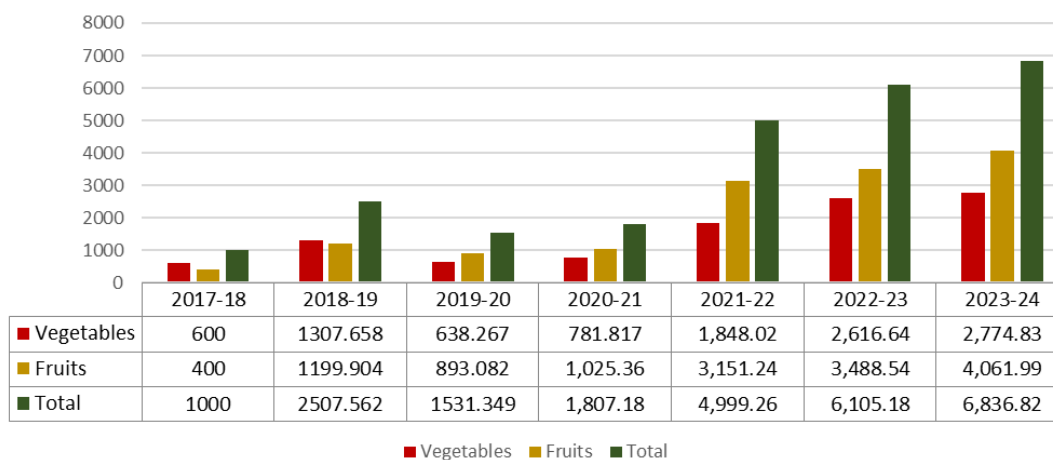


Fig. 2. Fiscal year-based amount of export (Metric Tons)

#### Earnings from the exports

It is shown that in the fiscal year 2017-18, only a number of seventeen fresh fruits and vegetables were exported to the European countries through the center where the numbers of vegetables and fruits were 12

and 5 respectively. After establishment of the packing house, the number moved upward steadily in the following years reaching the total numbers of 53, 53, 87, 96 100 and 102 in 2018-19, 2019-20, 2020-21, 2021-22, 2022-23 and 2023-24 respectively (Fig. 3).

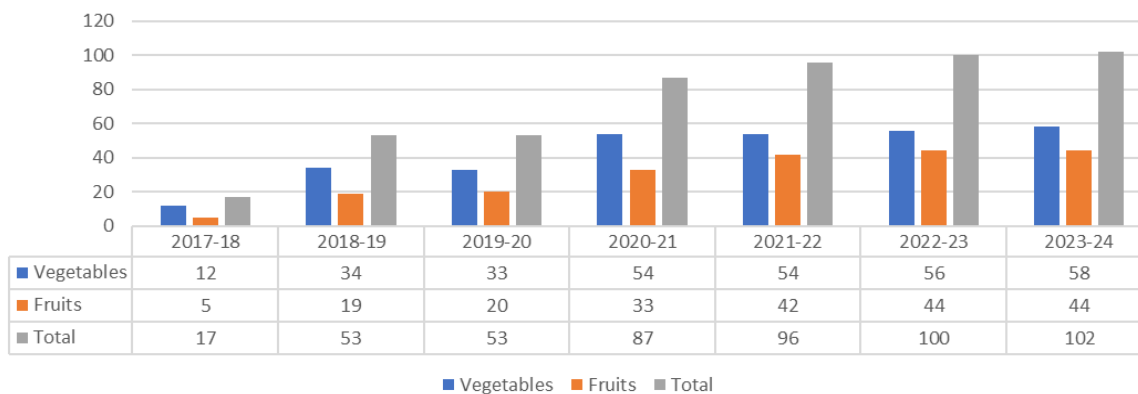


Fig. 3. Number of the exported produces (Fiscal year-based)

#### Number of exported items

In the case of earning foreign remittance, Bangladesh received an amount of 7,15,000 USD in 2016-17 from the countries by importing fresh fruits and vegetables. After establishment of the central packing house, the volume of remittance almost doubled by 19,15,000 USD in the following fiscal year. The trend of remittance continued to skyrocket gradually and reached 30,58,000 USD in 2020-21. Later on, despite continues increase in

amount of export, the earning of foreign remittance showed a slight down-ward trend in the following years and ended with an amount of 25,08,000USD in the fiscal year 2022-23 (Fig. 4). It is observed that earning of foreign remittance does not solely depend on the amount of export as price of the commodities depend various factors, for instance the purchase ability of the buyers, varied price of products and so on.

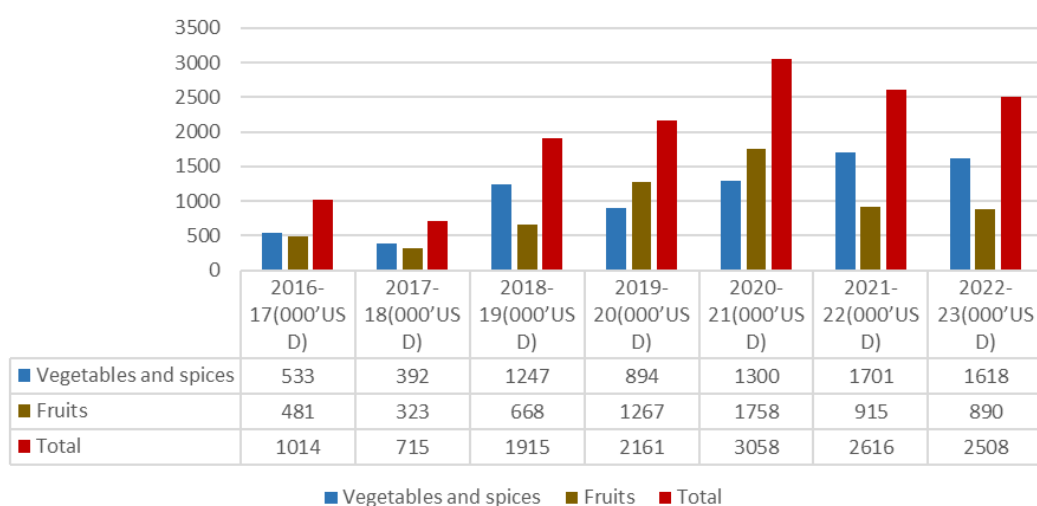


Fig. 4. Trend of foreign remittance from the exported products

Source: Annual export receipts of goods and services of the Bangladesh Bank (2016-17 to 2022-23)

Between January and July of the year 2015, the EU had rejected 143 export consignments due to the presence of pests and absence of phytosanitary or plant health certificates (Parvez, 2015). In 2015-16, the number of noncompliance was 153. After the inauguration of the packing house in May of 2017, ensuring standard phytosanitary activities, introducing compliant farm practices, establishing pest proof sites of production, approaching the systems of contract farming, managing the produces at pre-harvest and post-harvest

conditions properly, ensuring skilled inspection and testing as well as overall regulation of the center, the number of noncompliance drastically reduced by a number of 15 in 2017-18. Further, due to an overwhelming increase in the total amount of export, the number of noncompliance increased slightly. In 2018-19, the total numbers of noncompliance from the importing countries were 63 which remained almost indifferent across the years and ended with 61 in 2022-23 (Fig. 5).

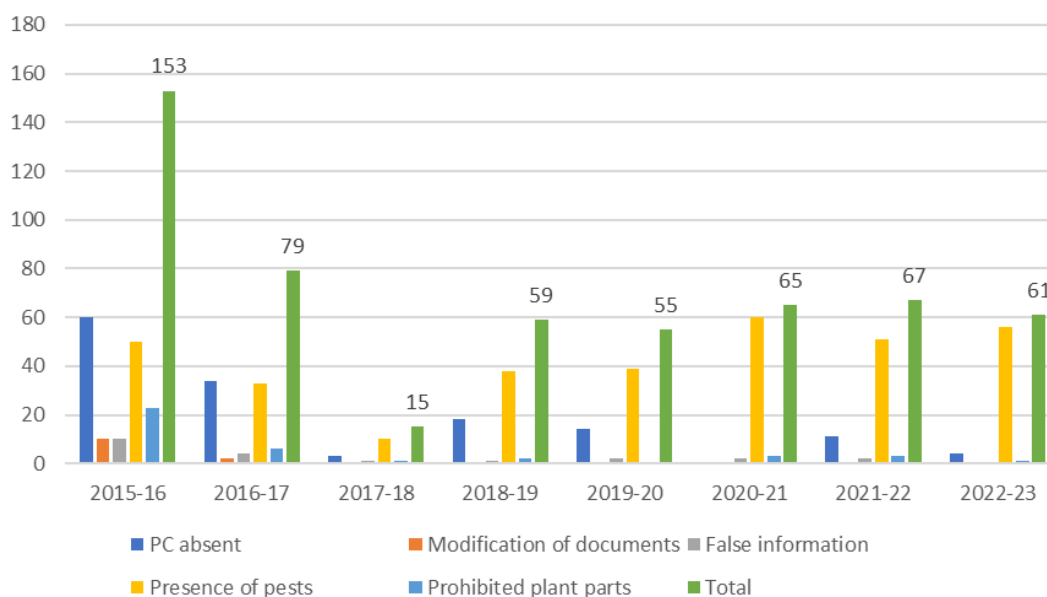


Fig. 5. Scenario of non-compliances from the importing countries (Numbers)

#### Resuming banned products

The EU banned betel leaf imports from Bangladesh in 2014, finding Salmonella infection and lifted the ban in

2021 (The Business Standard, 2021). In July 2007, the Department for Environment, Food and Rural Affairs (DEFRA) of the UK detected the presence of citrus

canker, an infection which causes lesions on the leaves, stems, and fruit of citrus trees, in these fruits at Heathrow Airport. Since then, the exports of these fruits to European countries had been stopped (Das, 2022). Later, the citrus export resumed successfully in 2022.

### Conclusion

A tremendous improvement in almost all of the studied parameters of export resulted by the in-house and field activities of the packing house was recorded in the study. Therefore, it can be recommended that more packing house should be established to utilize the enormous potential of Bangladesh's Agri-export.

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