

## Production and Export Possibility of Canned Pineapple and Pineapple Leaf Fiber in Bangladesh

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**Abstract:** This study explores the production and export possibility of canned pineapple and pineapple leaf fiber in Bangladesh. Pineapple has huge demand both locally and internationally for several types of uses. Its consumption is increasing day by day because of its different nutritional value. Since exporting fresh pineapple is difficult because of its perishable nature, many countries are exporting canned pineapple. Besides, because of the pineapple leaf fine fiber quality with its organic nature, it is already used for making different types of products (clothes, rope) in some countries. In Bangladesh almost every year farmers found huge surplus cultivation after supplying the fruits in the local market. As Bangladesh has a well cultivation of pineapple so it's easy to establish this potential export site. This study is a descriptive research where qualitative research method is applied to analyze the collected data. Findings showed steadily increasing production, cheap production costs and availability of cheap labor, standardized products quality, raw materials availability with simpler production procedures, international market demand, demand for organic and natural fiber, entrepreneurial development and various government incentives indicate favorable export opportunity of canned pineapple and pineapple leaf fiber. The findings of this study gives insight to policy makers, investors, and pineapple cultivators as well as fruits businessmen to open the door of a new export sector here in Bangladesh. Besides, this study is also helpful to others pineapple producing countries as well as researchers to use canned pineapple and pineapple leaf fiber related information.

[Key words: Pineapple of Bangladesh, Canned pineapple, Pineapple Leaf Fiber, Organic Fiber, New Export Site.]

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### I. Introduction

Pineapple, also known as *Ananas* which is a delicious tropical fruit full of nutritional benefits. According to different study pineapple is a healthy fruit with different types of vitamins and minerals. More than 130% daily requirement of vitamin for human beings come from a single pineapple. Pineapple reduces the threats of cough and cold, prevent cancer, improve vision, bone health, oral health, improve blood circulation and regulate blood pressure (Hossain *et al.* 2015).

Pineapples are now cultivating worldwide. Based on time series analysis, it is the fourth most important fruit in Bangladesh in terms of its cultivating (Hossain and Abdullah, 2015). Pineapple is becoming the main industrial product of many countries and international demand for pineapple is increasing. It is widely cultivated because of its delicious and fragrant fruit in tropical and sub-tropical regions of the world. Bangladesh has a great probability of pineapple cultivation. According to the Bangladesh Bureau of Statistics (BBS) report most of the pineapple cultivates in Dhaka, Chittagong Hill Tract, Tangail, and Sylhet area. Dhaka division is the highest cultivable land in Bangladesh. May-July is the harvesting time of pineapple. After fulfilling the local demand there has found a surplus quantity of pineapple. Most of the time the cultivators either have to sell the surplus quantity at a low price or have to destroy the fruits. Every year a large amount of pineapple get damage because of proper preservation. Farmers are losing hope and they are shifting their farming.

In Bangladesh, ripen pineapple consumed by the people. But internationally there have a demand of canned pineapple. By preserving the pineapple in a can with syrup it can be preserved for a year. Besides the cultivating season consumer can get the pineapple all the time. There are many countries who are exporting the pineapple using the can and syrup and there have demand of this processed pineapple almost all the important international market. Philippine and Thailand is the main exporter of canned pineapple. Every year Philippine is producing a large amount of canned pineapple from its pineapple cultivation. European Union and American market is the main importer of canned pineapple. With the surplus quantity of pineapple production Bangladesh also can enter those markets.

Global awareness is increasing about pollution free environment. Developed countries are now thinking about eco-friendly industrialization. Based on this the demand of environment friendly fiber is increasing day by day. Man-made fiber is light in weight but they contain different chemicals. Different type of natural fiber is introducing. Among them pineapple leaf fiber is famous for its different properties.

This unused part of pineapple should have concern because of its highly commercial value. It is more useful than any other natural fiber. Pineapple fiber composite can be used in making different types of products. It is also used with other fiber to increase the sustainability of cloth. This natural fiber can be used as the alternative of existing textile fiber.

From the interview of Horticulture department official it is known that from every pineapple only 52% can consume as fresh fruit and jam or juice production, remaining 48% of pineapple peel and leaves are forming wastes. By using these wastes quality full luxury fiber can be produced. Pineapple fiber is famous for its lightness, softness and highly lustering quality. It is strong, soft, breathable, versatile, light, flexible textile that can be easily printed, stitched and cut. The fiber is used in making footwear and different fashion accessories. It also can be used in interiors, car and aeronautics industries.

Philippine, Thailand, Indonesia, China, India are the main pineapple cultivator in South East Asia. All these countries have good potential in making pineapple leaf fiber and different type of pineapple product. Bangladesh is also producing a good amount of pineapple in every year. It has a huge opportunity in pineapple leaf fiber production. Using the huge amount of pineapple wastes it also can enter in the natural fiber market. After harvesting and consuming the waste of pineapple is polluting the environment. So we can use those wastes effectively by implementing technology. No extra land, fertilizer and pesticide is not needed to make this products.

### **1.1 Rationale of the Study**

Pineapple is the fourth important tropical fruit in Bangladesh. As Bangladesh has the suitable weather for pineapple cultivation, so it can increase its foreign currency earning by exporting different types of pineapple made products. Generally, the ripe pineapple is consumed by the people of Bangladesh but people also likes different types of canned fruits. Pineapple is highly perishable fruit so preservation of huge amount of cultivation is not easy. So, Bangladesh can use its surplus pineapple cultivation to produce canned pineapple. By fulfilling the local demand the country can also enter into the international market. As it is already known there have many potential markets.

After extraction of its juice, the residue is used as garbage or in some cases as livestock feed. So it can utilize the pineapple wastages by promoting pineapple leaf fiber production. Already Bangladesh has a well establishment in garment sector. By producing pineapple leaf fiber it can expand its textile sector. Some promotional activities have started to promote pineapple leaf fiber in Bangladesh by funding support from European Union and Ministry of Industries, Government of the People's Republic of Bangladesh under Bangladesh INSPIRED program. Since Bangladesh has only few actual and potential export sectors so it is expected that this study will contribute to identify another potential export sector of Bangladesh. Findings of this study encourages many entrepreneurs and established businessmen to engage in this business. Besides it also helps others pineapple producing countries as well as researchers to use canned pineapple and pineapple leaf fiber related information from this study.

### **1.2 Objectives of the Study**

The objectives of the study is to identify the possibility of canned pineapple and pineapple leaf fiber exporting from Bangladesh. To more specific,

- To identify the possibility of canned pineapple production and export using the surplus quantity of pineapple cultivation.
- To identify the possibility of pineapple leaf fiber production and export using the wastes of huge pineapple cultivation.

### **1.3 Scope of the Study**

Canned pineapple and pineapple leaf fiber production is not very popular in Bangladesh still now. Many farmers do not have any clear idea about these. Any notable work was not found regarding the production and export possibility of canned pineapple and pineapple leaf fiber in Bangladesh. So there have an opportunity to work on it. As both canned pineapple and pineapple leaf fiber can be two potential sectors so most of the officials cooperate by giving different types of information and their opinions.

## II. Review of Literature

Pineapple is a symbol of tropical fruit which has a good appreciation all over the world for its excellent qualities. To avoid water pressure pineapple irrigation must be preferentially done during the phonological stage of major growth activity (Azevedo *et al.* 2007). Different types of product from tropical fruits have increasingly gained global importance because of their characteristic exotic taste, aroma and color (Abboet *et al.* 2006).

Pineapple is a common fruit in Bangladesh and it contain good amount of various vitamins, carbohydrates, crude fiber, water and different minerals that is good for the digestive system and helps in maintaining ideal weight and balanced nutrition (Hossain and Islam, 2017). More than 90 countries around the world are producing the fruit; Bangladeshi pineapples are more juicy and tasty than the others. So if it can be marketed properly then these pineapples are sure to earn huge amounts of foreign currency through export (Samdani, 2014).

Most of the pineapple cultivator are mainly small and marginal level farmers, they sell their product through trade agent at the village level and major share of pineapple marketing run by this system (Das *et al.* 2016). The main constraint in the marketing system of pineapple are lack of bargaining power, weak backward and forward linkage, poor storage facility and lack of available infrastructure for grading standardization (Das *et al.* 2016). In order to regain the market share both producer and exporter of nontraditional fruits and vegetables must have continuous innovation process (Whitfield, 2010). This statement can be proved by the condition of Ghana's pineapple export industry, because of no development in their technological capabilities the industry ran into a crisis and as a result they failed to turn their initial comparative advantage into customized competitiveness (Whitfield, 2010).

Maximum developing countries are exporting their food item in developed countries and they have to maintain food quality according to the food standard of those countries to increase the efficiency of production through standardization (Athukorala *et al.* 2002). Because of the scale which indirectly influencing the world trade share of processed food, the local market of processed food is still small (Majumder, 2013). The processed food export market could be influenced by the Foreign Direct Investment (FDI) but the direction of its influence is conclusive, so only single involvement of Multinational Enterprises (MNE'S) could generate positive effects as they have international production network to complete the information flow between the home country and other destined markets (Jongwanich, 2009).

As we know South East Asia is dominating in pineapple exporting. So we can see the situation of Thailand. Because of their higher domestic demand for canned fruit, lower import duty on packaging materials, market development in supermarkets and retailers in importing countries Thailand is dominating the canned pineapple export market. The major constraint of food SME's business is lack of packaging materials so the government can provide loan assistance in fiscal and non-fiscal incentives (Bathan and Lantican, 2009).

The concerns of sustainable development have encouraged internationally toward increasing the efficient utilization of raw resources and reduce the waste production. So the utilization of agricultural byproducts has been highlighted as alternative fiber resources (Yusofa *et al.* 2015). Agro based bio-fibers have the composition, properties and structure that make them suitable for different uses such as composite, textile, pulp and paper manufacture (Reddy and Yiqi, 2005). As fibers has the satisfactory desired conditions and transfer strength to the matrix constitute influencing and enhancing their properties so they have the importance based on class of reinforcements (Kumar and Mohanraj, 2017).

Replacing synthetic fiber with natural one is only the first step by considering the ecological aspects in material selection. Natural fibers cultivation depends mainly on solar energy and relatively small amount of fossil fuel energy may be needed for fiber production, processing and extractions (Rohit and Dixit, 2015). The different use of natural fibers are growing in many sectors, such as automobiles, furniture, packing and construction and this is mainly because of their different advantages like low cost, low weight, less damage to processing equipment, improved surface finish of molded parts composite, good relative mechanical properties, abundant and renewable resources compared to synthetic fibers (Yousif *et al.* 2012).

Besides the fruit different parts of pineapple plant can be used as a good resource of various industrial products. Thousand tons of natural fiber could be extracted from million tons of pineapple leaves which discarded yearly which can be able to industrialize and commercialize the processing of pineapple leaf fiber (Bhattacharyya, 1998). Pineapple leaf fiber has tremendous mechanical properties and have the application to reinforced polymer composite (Cellis, 2000). Pineapple leaves have a strong, white, silky fiber, some certain plants cultivate specially for fiber production and their young fruits are removed to give the plant maximum vitality (Hossain, 2016).

The pineapple leaf has a ribbon structure and it is cemented together by materials like lignin and pentosan which bind together with a cellulosic composition (Baniket *et al.* 2011). Pineapple leaf fiber is more favorable as a potential substitute for wood fiber from corn stalk and napier grass (Zawawiet. *al.* 2014). The highly valued fabric which made by handmade woven from pineapple leaf fiber and inflated with intricate embroidery was fashioned into clothing and accessories that were a part of the traditional Phillipino cultural

heritage for centuries. The aspect ratio of the leaf fiber of pineapple plant is four times higher than jute and the strength is as good as sisal (Kamarudina and Yusof, 2016).

So from the above literature it is found that there are lots of uses of pineapple as well as export opportunity of canned pineapple and pineapple leaf fiber. But in reality it is found that nearly no amount of pineapple made products are exported from Bangladesh. From the review of these literature it is also found there are not conducted any significant research and study in this field to identify the export and production potentiality of canned pineapple and pineapple leaf fiber.

### **III. Research Methodology**

#### **3.1 Research Type**

The purposes of this research is to identify the production and export possibility of canned pineapple and pineapple leaf fiber in Bangladesh and promote these sector based on the practical situation of present pineapple cultivation. This study is based on descriptive research where qualitative method was used to analyze most of the data and to identify the purpose of the study. Besides this, some quantitative data was also collected and analyzed to present the actual present status of the research topics.

#### **3.2 Sampling and Questionnaire Design**

In this study semi-structured questionnaire was designed to identify canned pineapple and pineapple leaf fiber production and export possibility in Bangladesh. The questions were a combination of inquiry about the pineapple production rate, facilities for production, profit margin and development of pineapple cultivation in Bangladesh and finally different opportunities that the respondents thought to establish or develop the focused production area. Most of the questions were designed as open ended where in face to face interview the respondent were given scope to answer based on their available information and in own point of view. Purposive sampling technique had been used to determine the sample size and gather relevant data. From the 70 respondents 20 were mostly top level officials related to Agricultural Department of Bangladesh government and 50 were pineapple farm owners, local fruits (pineapple) businessman, farmers and field level workers.

#### **3.3 Data Collection**

Data was collected by visiting the mostly pineapple cultivated area Rangamati and Tangail. Information was taken from the cultivator and from different official of Department of Agriculture Extension, Ministry of Agriculture, Upazila Agriculture Office of Naniarchar and Madhupur, the Department of Agricultural Extension, RangamatiKhamarbari, Tangail and Dhaka Khamarbari. And also from Horticulture wing of the Department of Agriculture Extension, Dhaka Khamarbari. The collection period of the data was between the months of March to July, 2019.

#### **3.4 Data Analysis**

The collected data were presented using charts and diagrams by using Microsoft excel. Information gathered from the interviews are arranged systematic way in order to identify the objectives of this research.

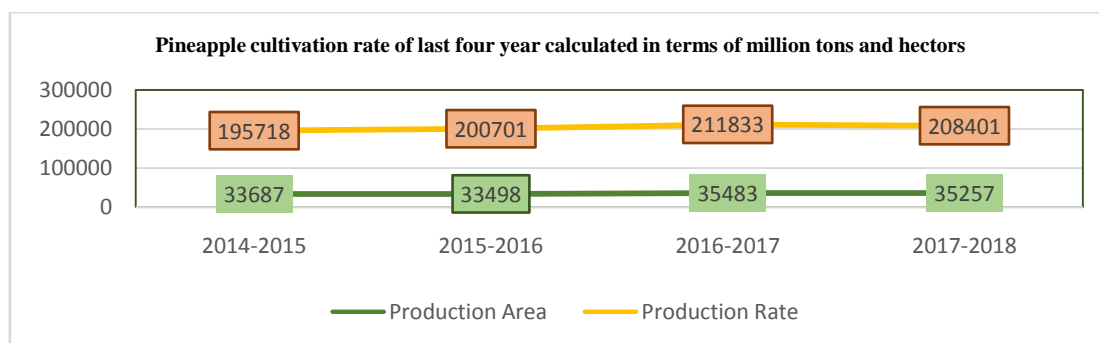
#### **3.5 Limitation of the Study**

After conducting the research, preparing the report was little tough as there was no notable work on this specific topic. Since canned pineapple and pineapple leaf fiber production is not much popular in Bangladesh, it was a little difficult to reach on available information for doing much extensive and deeper level of study

### **IV. Research Results**

#### **4.1 Analysis and Discussion of the Study**

**Production Potentiality:** Since pineapple is a tropical fruit and the weather of Bangladesh is suitable for pineapple cultivation, the pineapple cultivation is increasing day by day here. Around 208401 million tons pineapple cultivate in 30203 hector land in Bangladesh in the year of 2018. Most of the pineapple cultivates in three main cultivable zone. These are- Chittagong Hill Tract, Tangail, and Sylhet. Last five year pineapple rate of Bangladesh is shown below in the chart.



**Table no 1 Source: Source: Author’s construction based on the data of Department of Agriculture Extension, Ministry of Agriculture, Khamarbari, Dhaka.**

The above data shows that Bangladesh produces sufficient amount of pineapples every year. So it is easy to enter in the canned pineapple market using the exceed amount of pineapple.

**Cheap Production Cost:** Pineapple is the fourth most cultivable fruit of Bangladesh. The production cost of pineapple is not that much. Most of the farmers, cultivate pineapple in a traditional way. Now-a-days Ministry of Agriculture is giving necessary training of pineapple farming and providing necessary medicine to the farmer by regional agriculture office.

**Availability of Relatively Cheap Labor:** There has abundant supply of cheap labor in Bangladesh. According to the regional agriculture office it is known that the labor cost of pineapple cultivator is not more than per 500 BDT (\$8) per day. Most of the farmer in Rangamati, Bangladesh cultivates their own land with the help of their family members so they don’t need to pay any labor cost. This adds an advantage here.

**Standardized Quality Products:** Pineapple of Bangladesh has standardized quality. Giant kew and Honey queen, two most internationally famous varieties are cultivating in Bangladesh. Honey queen mostly cultivate in Rangamati and famous for its juicy flavor. Giant kew cultivate in Tangail and it is famous for its big size. Both types of this pineapple has so much international demand.

**Availability of Raw Materials:** The main raw material of canned pineapple and pineapple leaf fiber is fresh pineapple and its leaf. Based on the huge amount of pineapple cultivation it is easily possible to establish this sector.

**Efficient Labor Force:** Bangladesh has efficient and semi-skilled labor forces that are engaging in the cultivation of huge amount of pineapple every year. By receiving training which is provided by the Agricultural Department of Bangladesh Government, farmers are becoming more aware and they are learning the process of increasing the cultivation rate.

**Entrepreneurial Development:** As the government is providing various facilities for start-up business and the raising sectors get different types of facilities. So by well promotional activities it is easy to attract investors. There are many internationally established food and beverage companies in Bangladesh which can utilize this opportunity of potential production of canned pineapple and can expand their export items. And since Bangladesh is doing well in garments sector over the years so the fiber collected from pineapple leaf would be a great source of raw materials for garments products.

**Adding Different Varieties:** There are nineteen varieties of pineapple in the world. Among them two varieties are cultivating here in this country which have much international demand. By developing the research activity Bangladesh can add different types of pineapple cultivation and can increase export potentiality. Ministry of Agriculture of the Bangladesh Government has already taken the research activities.

**International Market Demand:** Because of high nutritional value the demand of pineapple is increasing in both the national and international market. European market is the main target of many pineapple exporting countries. As Bangladesh has given different trade facilities by European Union so entering that giant market is quite easy for Bangladesh. Many Bangladeshi live in different countries of the Middle East and there is a demand for local fruits. Many of the local company of Bangladesh like Pran Group Ltd, RahimAfroz Ltd, Square Company Ltd etc. have strong competitiveness in those markets. So entering in the canned pineapple market will be beneficiary for Bangladesh.

**Demand for Natural Fiber:** The worldwide increasing demand for natural fiber is a plus point here. Many famous fashion designers are now using different types of natural fiber to make exceptional products. As it is known pineapple leaf fiber is luxury type cotton and it has international market demand so it can become an efficient export item.

**Already Established Handloom Sector:** Naturally and culturally Bangladesh has already some famous handloom clothing items. Jamdani, Tant and Khadi are world famous. In the hill tract area indigenous people has wonderful handloom efficiency. They produce their own products and sell them in the local market by using various fibers including pineapple fiber. Besides the availability of raw materials make it possible to establish handloom sector for pineapple leaf fiber production.

**Employment Generation:** By the pineapple leaf fiber extraction and weaving industry people can have income and employment opportunities needed to substantially improve their lives. This will lead to huge potential and economic rewards for indigenous weavers. By improving the living of their families and their communities country can get benefits from this. Extraction of fiber, weaving and embroidery jobs enable to earn money that allow them to remain at home. By joining this sector they don't need to join any hazardous and non-prestigious jobs (such as- brick field, rice mills or domestic worker) to earn money.

**Simple Machinery Requirement:** Pineapple leaf fiber can collect on traditional way. But for a huge amount of production many countries are using machine for collecting the fiber. The technology of collecting pineapple fiber is not that much costly so investor can easily invest here.

**Social factors:** Besides many other factors, social factors include the national aspects and health awareness, career attitudes and emphasis on safety. High trends in social factors affect the opportunity of establishment of canned pineapple and pineapple leaf fiber production.

**Government Incentives:** Bangladesh government has taken a lot of projects to identify its new export potential sectors thus diversify its exports sectors. Governments also provide various incentives like tax exemption, subsidy to promote these exports sectors.

#### **4.2 Findings of the Study:**

Based on the data analysis it is seen that pineapple cultivation is increasing every year in Bangladesh. This is a positive news for canned pineapple production. The higher cultivation rate will result in an increase the amount of surplus and using the surplus quantity canned pineapple production and export will be possible. Besides the increasing amount of cultivation, there will be a huge amount of leaf wastages. This leaf is the main raw materials for pineapple leaf fiber production. So based on the available raw materials and potential production with a low production cost, there have a well production possibility of canned pineapple and pineapple leaf fiber.

It is already known that there is increasing international demand for both canned pineapple and pineapple leaf fiber and production of these twoproducts is not so complex. As Bangladesh have efficiency in cheap labor costand government provides various incentives for export promotion so it can use these resources to build this potential export site. Since international market demand of pineapple leaf fiber is increasing, Bangladesh can use its already established garment sector to avail the opportunity of natural and organic pineapple leaf fiber made products to export in foreign country. So it can be a complementary export site of garments sector. It is well known that Bangladesh has a friendly environment for foreign investment. So by attracting the foreign investors to invest in these sectors it can easily grab the opportunity of entering in the international market and establish a good export sector.

### **V. Conclusion**

This study has identified the exports possibility of canned pineapple and pineapple leaf fiber from Bangladesh. It is a descriptive research where qualitative research method is applied to analyze the collected data. From the discussion it can be said that there has huge possibility of producing and exporting canned pineapple and pineapple leaf fiber production in Bangladesh. Situating in the sub- tropical area is a great advantage for Bangladesh. From the study it is seen that pineapple cultivation and production is increasing here. The strength of pineapple cultivation will capable to provide available raw materials for both the canned pineapple and pineapple leaf fiber production. As a developing country Bangladesh has different types of trade facility in different international market, so besides other export products it can also add this potential sector in its export basket. By fulfilling the national demand it can enter in the international market by exporting canned pineapple. Pineapple leaf fiber is highly demandable product in international market for its organic nature so it

can use this opportunity in productive way. This study showed since every exports triggering factors are favorable, Bangladesh has a well opportunity of exporting canned pineapple and pineapple leaf fiber from Bangladesh thus make profit from international market. Policy makers, investors, businessmen and cultivators of pineapple will be highly benefited from this study. Besides this study also provides valuable information to other researchers who will be interested to study in this area.

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