

## INNOVATION IN BANANA TREE PROCESSING: 'THE BOX' CRIPS AS A LOCAL ECONOMIC DRIVING ASSET

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**Abstract** - Indonesia, as a fertile agricultural country with various types of plants, has abundant potential from a variety of plants. One of them is the banana tree which is known as the "Tree of a million uses" because each part of this tree has its own useful value. However, not a few are aware that apart from the fruit, the banana stems remaining after harvest also have great potential which unfortunately is often overlooked. This article discusses an innovation called "The BoX" which is a banana stem chip or often known as "Debog". This innovation utilizes banana stem waste, which is rarely processed, from Mantren Village, the majority of which consists of banana trees. The approach used in this research is the Asset Based Community Development (ABCD) method which involves active participation from various elements of the Mantren Village community. The results of this innovation program created a superior village product, Chips "The BoX", which has high selling power in the market both offline and on online buying and selling platforms thanks to the uniqueness of the product. This superior product not only opens up new market opportunities, but also creates jobs, supports the local economy, helps raise people's standard of living, and elevates the name of Mantren Village to The Box Chip Processing Center. This banana tree processing innovation can have a positive impact in the long term with optimal socio-economic potential as the main driver of the local economy.

**Keywords** : Innovation, Banana Tree, Debog, "The BoX" Chips, Local Economy.

## 1. INTRODUCTION

Food and plants are the main staples for human needs, food is a necessity for life while plants are a source of human food. Plants are a natural and non-natural source of life, occurring in various processes and making the variety of plants and crops develop over time.

Indonesia is known as an agricultural country that has a lot of fertile land with large expanses of land and is utilized by planting a variety of plants. These plants include staple foods, fruit and medicines. This diversity of types means several advantages can be taken from various types of plants so that they can be used as a source of life and develop the economic power of the community. One plant that has these two benefits is the banana tree.

The banana tree is a plant that originates from Asia. This plant, which is almost certainly found in various regions, basically has many benefits but its use is still less than optimal. Banana tree trunks are simply ignored after the tree bears fruit, therefore the potential for banana tree trunk waste is very large in agricultural areas, especially in Indonesia. This versatile plant, often referred to as the "Tree of Life", has a remarkable characteristic- almost every part of it can be utilized in one way or another (Smith, JA, & Johnson, BR, 2020).

Mantren Village, Karangrejo District, Magetan Regency, East Java Province has the nickname "Gemah Ripah Loh Jinawi". This is because of the abundant natural wealth and resources in the area. Mantren has the main plant, namely banana trees which grow around the residents' gardens and yards. Apart from using the fruit and leaves of banana trees, it turns out that banana tree trunks or gedebog can be used to make processed food chips which have high nutritional value.

This research focuses on processing banana tree stems (Debog) into a chip product called "The BoX" chips. This research aims to change components that are considered unimportant (Waste) into economic value, such as banana tree trunks (Debog) which are only thrown away after the tree bears fruit, which can be used as the latest innovation in the culinary world, namely "The BoX" chips. This study is not just an innovation effort but is a deliberate attempt to evaluate the socio-economic impact of this transformative process ( Rahman, A., & Gupta, S, 2018) .

In this context, the use of natural resources began to be mapped by processing banana tree trunks (Debog) into processed chips "The BoX". This utilization can also realize the principles of sustainability and comprehensive exploitation of banana trees, as well as realizing a deep commitment to reducing waste and encouraging a circular economy in the banana industry. Mantren Village has micro, small and medium enterprises (MSMEs) which can be the lifeblood of the local economy, encouraging growth, employment and community resilience. However, they often face various challenges, ranging from limited access to resources , technological constraints and product diversity ( Sharma, R., & Mishra, P, 2017) .

"The BoX" with its unique qualities and potential market appeal, promises to not only answer some of these challenges but also make a significant contribution to the sustainability and competitiveness of MSMEs in Mantren Village and its surroundings. By introducing new revenue streams and expanding market opportunities, "The BoX" Chips have the potential to

increase the fortunes of these local businesses, thereby strengthening the foundation of the community's economy.

In a broader context, understanding the intricacies of processing methods and socio-economic impacts associated with “The BoX” chips is not just an academic exercise; this is a necessity for informed policy making (Anderson, CD, & Johnson, EF, 2015). These insights, obtained from in-depth research and empirical data, can serve as a guide for policy makers who have the responsibility to formulate strategies to improve the economic well-being of Mantren Village and similar communities facing similar challenges. This aims to uncover the hidden potential that exists in banana trees, empower local micro, small and medium enterprises, and guide policy makers in making decisions that promise a brighter economic future for Mantren Village. This is a testament to the endless possibilities offered by nature and the transformative power of sustainable economic development (Patel, VK, & Gupta, N, 2013).

## **2. METHOD**

### **A. Types of research**

The method or approach used in this service is Asset Based Community Development (ABCD), this method is centered on community development based on local assets that exist in an area, namely Mantren village and prioritizes the utilization of assets and potential that exist in the village (Selasi et al. , 2021) . The ABCD method was used through a participatory approach in the training program on the use of banana trees to make "the BoX" chips targeting members of BUMDES, PKK, housewives, Ustadzah TPA Nurul Hikmah as well as Fatayat and Muslimat women in Mantren Village.

This research includes field research conducted on the object of discussion which focuses on field activities. This research is descriptive qualitative, namely research that does not use calculations or statistics. This type of research is used to explain facts that are appropriate to the existing situation and conditions. In data analysis techniques, researchers use analytical descriptive data analysis techniques, namely data related to the theme being researched, collected and classified and then described (Ida Fauziatun Nisa & M. Iqbal Tawakkal, 2022) .

### **B. Data Collection Method**

The data collection method in this research was carried out through literature study, interviews and observation. Literature study is a method of collecting data by understanding and studying theories from various literature related to the research. This data collection uses the method of searching for sources and constructing them from various sources, for example books, journals and research or previous studies (Adlini et al., 2022) .

Interviews in general are conversations between two or more people conducted by an interviewer and a source. The interviews used in this research were structured and

unstructured interviews, in this case the researcher conducted interviews with several sources such as MSME owners, workers and the local community of Mantren Village.

Meanwhile, the observation stage is a data collection technique carried out through observation accompanied by recording the condition or behavior of the target object. When using observation techniques, the most important thing is to rely on observation and record all existing conditions. Observations in this research looked at how "The BoX" chips MSMEs started from the manufacturing process, the tools used during manufacture and also the packaging of the product.

### **C. Research Work Procedures**

#### **a. Literature review :**

- i. Identify literature related to processing banana stems into chips products that have economic value.
- ii. Analyze the literature to understand the process and its impact on the local economy.

#### **b. Interview :**

- i. Identify and contact business owners who have the potential to produce "The BoX" chips.
- ii. Arrange interview schedules with MSME owners, workers and local communities.
- iii. Conduct interviews with structured questions to gain in-depth insights.

#### **c. Observation:**

- i. Direct visit to the production location of "The BoX" chips to make direct observations.
- ii. Observation and Evaluation of Production Process
- iii. Document photos or videos directly.

#### **d. Data Analyst:**

- i. Analyze qualitative data from interviews and observations to identify patterns and findings.
- ii. Connect the findings with the literature that has been collected.
- iii. Interpretation of the impact of "The BoX" chips products on the local economy.

## **3. RESULTS AND DISCUSSION**

Banana trees are a type of tropical plant that is relatively easy to grow in the Indonesian climate. Banana trees can grow in wet, humid and hot tropical climates with optimal rainfall of 1,520–3,800 mm/year and 2 dry months (Nia Aprilia: 2022). The banana tree itself has various types, which according to data is known to have approximately 200 types of bananas spread throughout the islands of Indonesia (Arifka: 2018).

The spread of Banana Trees throughout Indonesia is not only due to the easy process of planting and growing plants, the spread process is also benefited by the potential of banana trees which are considered to be trees of a thousand uses for "a thousand benefits".

This name is none other than because in a banana tree all its elements can be processed, eaten and utilized. Elements such as bananas, banana flowers and banana leaves are the main parts of the banana tree which is called a tree of a thousand benefits.

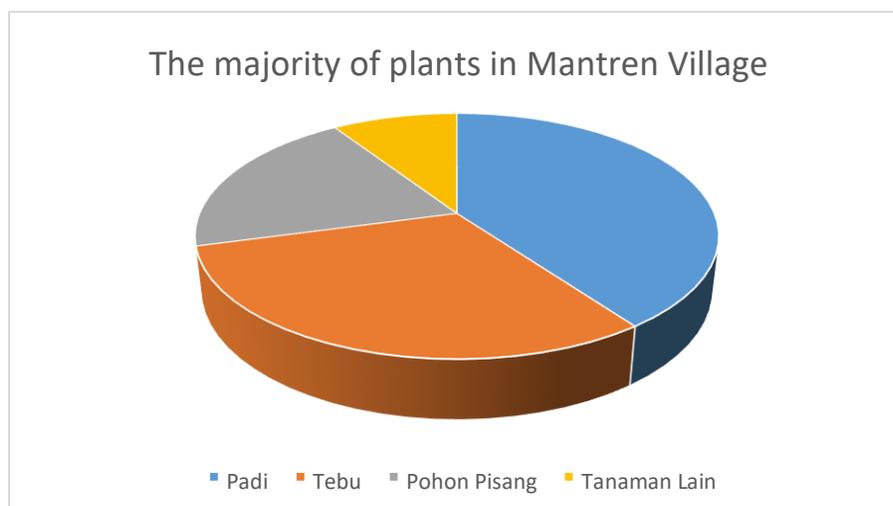


**Figure 1.** Structure and Benefits of Banana Tree Parts

A million benefits and uses make banana trees an inseparable part of the community's crops in rural areas. The many yards, plantations and fertile rice fields make banana trees sustainable in our rural homeland. One of the villages highlighted in this article is a village in the Magetan region which is known as a fertile, prosperous area and "Gemah Ripah Loh Jinawi" makes Magetan a destination for thousands of types of living and growing plants. At the tip of Magetan Regency, which is close to the border of Magetan and Ngawi districts, there are villages that have harmonious diversity, Mantren Village, Karangrejo District, Regency is an area that is the main focus in developing innovation and observing economic improvement through banana trees.

Mantren Village, based on data from P2K UTN, has an area of 706.44KM<sup>2</sup> divided into 3 hamlet areas which makes Mantren a large area with a variety of potential. After conducting field observations, it was found that the majority of the people of Mantren Village work as farmers and entrepreneurs. This means that commodities and economic circulation in village communities can be said to rely on both. Therefore, to develop the potential of these two professions, innovation and creative ideas are needed to improve the economy of village communities.

Mantren Village has a large area, and it is not uncommon to find large rice fields and plantations in the corners of the village or around people's houses. With the size of the village, various plants grow abundantly around the village area, rice and sugar cane are the majority of plants growing in the rice fields. Apart from these two, banana trees are one of the plants of the majority of village communities. Based on observations, it can be found that in each community house, on average, you can find 3-5 trees growing around the house yards and community gardens.



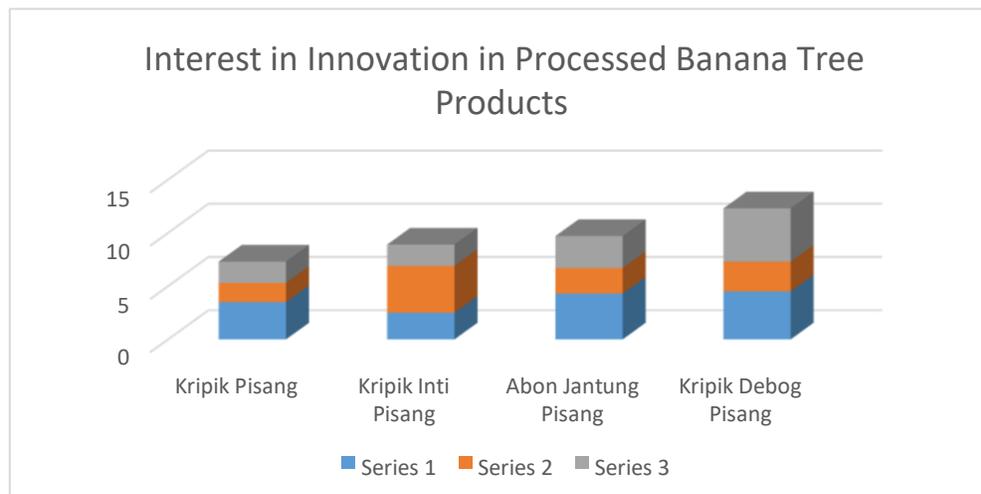
**Figure 2.** Diagram of the majority of plants in Mantren Village

Banana trees are the main crop of the people of Mantren village. As a plant, the banana tree is a type of plant that can bear fruit once during its lifetime, which means the banana tree will die after bearing fruit. After a banana tree dies, only the fruit and leaves are taken, while the stems become waste and are usually thrown away without being used or processed.

Banana tree waste or often referred to as "Debog" is the main point of the joint task, that there is still a need for innovation and creative ideas in managing banana tree waste into a multi-purpose plant for village communities to improve the local economy. Apart from the large number of banana trees in the village, the nutrients contained in banana stems according to various studies are: Dry matter (DW) 87.7%, Ash 25.12%, Crude fat (LK) 14.23%, Crude fiber (SK ) 29.40%, Crude protein (PK) 3% including amino acids, amine nitrate, glycosides, containing N, glycilipids, vitamin B, nucleic acids, extra nitrogen-free substances (BETN) 28.15% including carbohydrates, sugars and starch.

The banana tree or "Debog" in particular has a multitude of health benefits for the human body. Among these benefits are detoxification of the digestive system, treating kidney stones and urinary tract infections (UTI), weight loss, controlling cholesterol and blood pressure, curing stomach acid, stabilizing blood sugar, reducing childbed fever, treating chicken pox, reducing stomach acid and treating infection (Saputra, 2020).

The urgency and basic benefits above make innovation and creative ideas in processing banana trees the main thing and must be implemented for village communities. Interest in processed banana trees after conducting 3 surveys at the level of Village Government, Processors (Bumdes, UMKM), Consumers (Community) showed a significant increase in processed banana trees or "Debog" special.



**Figure 3.** Survey of Interest in Processed Banana Tree Product Innovation

The survey data shows that interest in banana tree products (Debog) is a product that is in demand by all elements of society in Mantren village. There was a good response and serious support from the community and village government, especially BUMDES (Village-Owned Enterprises) and Mantren UMKM in making processed Debog chip products into an interesting and unique preparation as a source of pride for the people of Mantren village.

Processed chips are a snack or snack that is very popular with all groups. The appeal of processed chips is that the practical process of making them does not require difficult tools or ingredients. The market opportunity for dry food and snacks is very prospective, especially dry food which contains fiber and also has health benefits . Processed Banana Tree Chips or Debog is one of the important innovations in creating unique and healthy snacks . Therefore, it is necessary to create a product that is safe, suitable and hygienic according to consumer product standards. There are several elements that must be considered as standards for processed chips, including, texture or crispness which is the main element in consumer assessment, appearance of food color, and size and shape in the sense that they do not crumble or break **Invalid source specified.**

In the future, it is hoped that Debog chips will be able to become a superior product commodity for the Mantren village, with the superior tagline "Mantren Pride" there is a big hope for this product to further introduce the Mantren village to a wider audience through its superior product. Therefore, it is hoped that future The Box chip products will be able to consistently maintain quality and adequate availability of raw materials. As explained above, Mantren Village has abundant availability of raw materials for chips, so the potential of Mantren Village as a center for processing debog chips is very potential.

Processing Banana Trees (Debog) into chip snacks is a simple and easy step, the availability of abundant ingredients and simple processing tools and techniques makes Debog chips very possible and feasible for mass production in the Mantren village . The

following is a table of raw materials, additional materials and production equipment for processing debog chips :

**Table 1.** Table of Materials and Production Equipment

Material	Production tools
1. Banana Tree (Debog)	1. Knife
2. Betel Lime	2. Pan or basin
3. Salt	3. Telephone
4. Baking Soda	4. Tray or Tampah
5. Water	6. Stoves and other frying equipment
6. All Purpose Flour	7. Oil Drainer
7. Rice Flour	8. Product Packaging
8. Tapioca Flour	
9. Cooking Oil	
10. Sprinkling seasoning topping (Balado, etc.)	

Main raw material for processed Debog chips is debog (banana tree trunk) while additional ingredients include whiting , salt, baking soda which are used in the soaking process using ice water to eliminate the effects of itching and sap as well as to make the chips crisper. . Next, enter the flouring process using all-purpose flour, rice flour and tapioca flour. For the original taste it depends on the processed all-purpose flour chosen, the level of crispiness is influenced by rice flour, and to maintain the texture of the chips, combine the dough with tapioca flour and baking soda . As a product variation to increase consumer purchasing power , namely providing a mixture with various flavors of spices including balado, sweet corn, etc.

In the production process, the use of production tools is generally tools that we often use, but there is a tool that we have to buy or make ourselves, namely an oil drain spinner which has the function of removing the oil content in the production of debog chips, with the aim of maintaining quality . as well as consistent product quality so that it is hygienic and marketable.

The production stage is a crucial stage, it could be said to be crucial because in the future it can determine whether a product is said to meet applicable standards or not. This product processed from banana tree chips or debog is given the name "Kripik The BoX" as a form of branding and product naming which is expected to attract the interest and enthusiasm of consumers in buying this chip chip product.

In the future, it is hoped that The BoX Chips product will be a unique and economical product, therefore, in supporting marketing it is necessary to pay attention to several important aspects of how a product is marketed. One of them is the sales and marketing aspect which has an important role in the continuity of a business, therefore it needs a reference in the marketing process, one of which is using the 4P concept (product, price, promotion, and place) **Invalid source specified..**

- Product design

In fact, processed Debog chips have become a product in other areas, but the consumer target is very broad and requires new innovations in packaging so that it has a special food impression. This debog chip processed product is called "THE BOX" and is sold in various flavors. Packaging that has an attractive design and a nice standing pouch gives the impression of expensive and delicious food. There is a tagline "Mantren Pride" making this product synonymous with Mantren Village.



**Figure 4.** Packaging of “The Box” Chips

- Price

Tjiptono said that in order to be successful in marketing a good or service, every company must set its price correctly **Invalid source specified..** Considering that chips are a product that is widely available on the market, this product must be able to compete in terms of price with other products.

<b>B. Supporting Material Costs</b>				
Packing	Seed	IDR 170,000.00	100	IDR 170,000.00
Salt	Seed	Rp. 1,000.00	1	Rp. 1,000.00
Ice	Seed	Rp. 1,000.00	1	Rp. 1,000.00
<b>Total</b>				<b><u>IDR 172,000.00</u></b>

The determination of the HPP of this product is as follows:

**Table 2.** Table of COGS for The BoX Chips Products

Items	Unit	Price	Amount	Total
<b>A. Raw Material Costs:</b>				
Debog	Seed	Rp -	1	Rp -
My flour	Kg	Rp. 7,000.00	3	IDR 21,000.00

Oil	Lt	Rp. 22,500.00	1	Rp. 22,500.00
<b>Total</b>				<b><u>Rp. 43,500.00</u></b>
<b>C. Overhead Costs</b>				
Gas	Seed	IDR 10,000.00	1	IDR 10,000.00
Electricity	Seed	Rp. 4,000.00	1	Rp. 4,000.00
<b>Total</b>				<b><u>Rp. 14,000.00</u></b>
<b>Total Cost (A + B + C)</b>				IDR 102,000.00
<b>Total portions</b>				25
<b>HPP</b>				Rp. 4,080.00

**Table 2.** Price Table for "The BoX" Chip Products

No.	Price Category	Price Amount (Std.)
1.	Promo Price for "The BoX" Chips	Rp. 8,000 (100% profit)
2.	Offline Market Price of "The BoX" Chips	Rp. 10,000 (120% profit)
3.	Online Market Price of "The BoX" Chips	Rp. 13,000 (130% Profit)

Debog chips sales have a wide market in all segments, therefore the prospect of large demand is very large, plus market competition for Debog chips is still low. With the benefits above, it can improve the economy of the Mantren community.

The emergence of this innovation can change the local economy of the Mantren Village community by empowering housewives because it can increase family income. Meanwhile, the advantage for Mantren Village is that it has local products that are marketable and competitive, thereby increasing village income.

- Promotion

Promotion is needed to introduce products to the public and is also carried out to help create an image of the product in society. However, this product has two promotional objectives, namely to influence the public to become entrepreneurs in processing Debog chips and to influence consumers to be interested in buying. To

implement the first goal, namely by using the ball pick-up method, there are several moments to interact with the people of Mantren Village to promote the processed "THE BOX" chips and ask for testimonials regarding the taste. And workshops that have been held twice include workshops on making "THE BOX" chips. The first was carried out in the Baitul Musyarrofah mosque environment which was attended by various elements, especially MADIN Nurul Hikmah teaching mothers. The second was carried out at the Mantren Village Office and in collaboration with the Cooperatives and MSMEs Service.

Meanwhile, promotional objectives influence consumers using two methods. The first is providing information directly by visiting expos, and the second is providing information indirectly by distributing pamphlets via social media.

- Distribution place

The choice of place for distribution of processed chips is offline and online. Offline can use one of the rooms in the village office for exhibiting BUMDES and MSME products from Mantren Village. Online using market places such as Shopee etc.

In the context of the economic development of Mantren Village, great hopes can certainly be placed on the potential of "The BoX" chips to become a superior product that contributes significantly to improving the welfare of local communities. The abundance of raw materials and large market potential give hope to Mantren village as a center for the chip industry "The BoX" which has strong potential to provide a positive impact in various aspects.

It is hoped that "The BoX" chips industrial center can become a source of new jobs for village residents, help reduce unemployment levels, and provide economic opportunities to local communities. Success in the production and marketing of "The BoX" products can open the door to reaching wider markets, including regional and national levels, which is the hope towards higher income potential for village communities.

Apart from economic benefits, the success of "The BoX" chips can increase Mantren Village's reputation as a center for producing quality chips. This could open the door to further collaboration and investment opportunities that have the potential to accelerate local economic growth.

With hard work and cooperation between local business actors, regional government, BUMDES and all MSMEs as well as support from various related parties, there is great hope that "The BoX" chips in the future will become a real example of how quality local products can act as a driver of economic growth. and the welfare of local communities.

#### **4. CONCLUSION**

Banana trees are plants that have great potential to be processed and utilized into products that have economic value. In this context, Mantren Village is a clear example as a

village that has the potential to become a production center for "The BoX" chips thanks to the availability of natural resources in the form of abundant banana trees.

With the abundant availability of raw materials and real support from various parties, Mantren Village has a great opportunity to develop the "The BoX" chips industry in a sustainable manner. It is hoped that "The BoX" chips can become a superior product that will become the pride of the village and be able to make a significant positive contribution to improving local welfare and economy.

Great hopes lie in the potential of "The BoX" chips product to provide employment opportunities, reduce unemployment rates, and empower local communities. Success in producing and marketing this product also has the potential to open a wider market, which in turn can increase the income and standard of living of the people of Mantren Village.

The final conclusion in this paper is that banana trees as raw material for "The BoX" chips products are a valuable natural resource that can provide great economic benefits if used properly. Mantren Village, with its abundant natural potential, has great hopes that "The BoX" chips product can become a driving force in improving local welfare and economic growth and become an example of success for other villages that want to utilize their natural potential optimally.

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