MODEL OF ECONOMIC EMPOWERMENT WITH INDUSTRILIZATION APPROACH USING BANANA WASTE AS THE RAW MATERIAL, IN NANGGROE ACEH DARUSSALAM (NAD)

Beureukat[1],
Rahayu Lestari[2]

ABSTRACT

The purpose of this research is to obtain empirical evidence of problems related to Economic Empowerment Model with Industrialization Approach Using Banana Waste Raw Material in Nanggroe Aceh Darussalam (NAD). The benefits of this research is expected to contribute economically by processing banana waste into semi-finished materials and finished goods, so that banana growers can earn additional income. The survey was conducted in three areas of NAD such as Pidie District (Muara Tiga Subdistrict), Bireun District (Juli Subdistrict), and Aceh Besar (Jantho). Respondents are the farmers who a author asked to fill in the form of questionnaires. They are as many as 130 peoples. Discussion in the form of FGD was also conducted by the researchers are more information related to banana plants and banana waste in the form of banana stems. The conclusion of this research is the creation of Economic Empowerment Model with Industrialization Approach of the Banana Plant Waste especially banana stems, supported by various stakeholders such as banana farmers, related to institutions, industry sector, good capital, and marketing which are promising to the banana farmers. The hypothesis proposed is in the opposite direction, so that to overcome waste problems of banana stems, it can be the efforts to improve the quality of banana trees. So, it will produce good banana stems waste to be used as material of semi-finished goods and finished goods. So, socioeconomically it will increase the income of banana farmers and will create new jobs as well.

Keywords: banana plant, waste, banana stem, economic value.

INTRODUCTION

The development of harvest area on banana outside Java is more volatile than in Java, but its development tends to be the same. The growth of harvest area outside Java is about 0.54% per year in the period of 1980-2015, 0.58% per year in 1980-2010 and in the last five periods (2011-2015) is only 0.32% per year.

Banana is a commodity that is easy to be cultivated and developed in Indonesia. Banana has various types, and it is a kind of fruit which is consumed by societies at all age and social status because the price is relatively affordable and easy to get it. In Indonesia banana is generally consumed directly (in fresh condition), especially for the types of ambon, king, mas, and barangan bananas. But, it is also consumed in the form of processed food like: chips, banana sale, compote, fried or boiled.

In 2013 Aceh Province are consists of 18 districts and 5 cities, 289 subdistricts, 779 settlements and 6,474 kampongs or villages. The area of Aceh Province is about 5,677,081 ha, which consists of forest as the widest area reaching 2,270,080 ha, followed by smallholdings plantation area of 700,350 ha. While, the industrial land has the smallest area about 2,096 ha.

One of the banana-producing provinces is Nanggroe Aceh Darussalam (NAD). The province is one of the largest banana producers in Aceh. It is the habit of people there planting bananas around their home yard if planting in small quantities, while for larger numbers, planting is away from the yard of their houses. According to Prihatman (2000) in the outlook of Banana Commodities 2016, banana is divided into four groups based on its type and utilization they are:
1) bananas which are consumed without cooking them, they are M. paradisiaca var sapientum, M. nana or also called M. cavendishii, M. sinensis, for example ambon, milk, king, cavendis, barangan and mas bananas;
2) bananas consumed after the fruits are being cooked, they are M. paradisiaca forma typica or they are also called M. paradisiaca normalis, for example nangka, horns, and kepok bananas;
3) banana which has seed that M. brachycarpa which only its leaves is used in Indonesia, for example stone and klutuk bananas;
4) banana which is taken its fiber for example manila banana.

According to the study of Jumjunidang et al (2012), Nanggroe Aceh Darussalam province (NAD) is not listed as a center of banana production in Indonesia, but the current reality NAD grows into an area for banana development especially for Barangan varieties simultaneously in some districts. From the discussions with the Food Crop Agriculture Department (Dinas Pertanian Tanaman Pangan) NAD Province, it was known in 2006 and 2007 approximately 1,000 ha banana plantation were opened by farmers in Aceh Besar, Pidie and East Aceh districts and Barangan varieties was chosen. From the discussion it was also explained that the Barangan banana will also be developed in other districts.

REVIEW OF LITERATURE, FRAMEWORK FOR THINKING AND HYPOTHESES DEVELOPMENT

2.1. Stage of the Art Industrialization Approach Banana Stem Waste

Agricultural commodities are generally produced as raw and perishable materials/food, so they need to be consumed directly. The processing of agricultural products can increase the use of agricultural commodities. One of the most commonly used concepts to discuss the processing of this commodity is the value-added. (Ryan, 2009).

One of the most important factors in increasing the profitability of farming is through the application of new technology. It can increase the number or quality of bananas or even both by applying new technology. With the same quality, which means at the same price of each unit, but the amount of production increases, the farmer's income will increase. Similarly, with the same amount of production, the quality of production rises, so that the price of each unit rises too, then the farmer's income will increase. (Moeljadi, 1983) in Ryan (2009).

Bananas are divided into three kinds, based on its benefits for human life, such as fiber bananas, ornamental bananas, and fruit bananas (Kaleka, 2013). Bananas can generally grow in the lowlands to the mountains with an altitude of 2000 m above sea level. Bananas can grow in a wet, humid, and hot tropical climate with optimal rainfall of 1,520-3,800 mm / year and 2 dry months (Rismunandar, 1990). The position of banana plants in the plant taxonomy according to (Kaleka, 2013) in http://repository.uin-suska.ac.id.

Yearly fruits superior commodities are consist of: banana, manggo, durian, and rambutan. The 2015 data shows that the districts potentially produce annual fruits are: Pidie, Aceh Besar, Bireuen, Pidie Jaya, East Aceh, South Aceh, Nagan Raya, and North Aceh. Banana plant is the largest potential fruit crops which provide the largest contribution to fruit production in Aceh.

In 2014, the annual fruit production of bananas reaches 552,448 quintals. Banana production in 2015 increased by 10-50% to 610.454 quintals. The largest banana production comes from Pidie Regency is reaching 44,84 percent (273,751 quintal) of total banana production in Aceh province. The districts of Central Aceh, Bireuen, and East Aceh contributed 11.04% (67,423 quintal), 8.87% (54,172 quintal) and 8.64% (52,773 quintal) respectively. Thus, the four districts as the largest banana producers contributed for about 73,39% of banana production in Aceh province. http://aceh.bps.go.id

2.2. Banana Stem

Banana stem is an agricultural waste whose utilization is not yet optimal, whereas the potential of raw materials is very abundant and has good fiber characteristics. So, it is suitable to be used as raw material for pulp manufacture for paper industry. Zulferiyenni, et al. (2009).

Agricultural waste is defined as material which is thrown away in the agricultural sector such as rice straw, corn straw, soybean straw, groundnut straw, livestock dung, coconut husks, and shell, rice bran, and the like. Agricultural waste may take the form of unused waste and waste materials from processing (Anonimus, 2008a). in Ketut (2015).

2.3. Agricultural Waste (Banana Stem) and how to process it

Generally, agricultural waste is divided into pre-harvest waste, during-harvest waste, and post-harvest waste. Furthermore, post-harvest waste can be classified into waste groups prior to processing and waste after processing or agricultural industrial waste (Anonimus 2008b) in I. Ketut (2015).

The definition of pre-harvest agricultural wastes are biological materials collected before or at the time the main results are taken. For example leaves, twigs, or stems of plants. The waste is usually collected as waste and is generally just burned. Livestock dung is mostly only used as manure, although it can still be processed into direct fuel or diiferated into biogas. Mushroom media and fodder mixture are some other examples of pre-harvest agricultural waste. Ketut (2015).

Banana stems can be used as basic materials of recycled paper, woven handicraft materials, and animal feed. The heart of bananas can be used as foodstuffs such as banana heart jerky. Banana peel can be used as a processed food product, such as nata and bread. Bumps of banana is also useful as a raw material of medicine, which can treat dysentery, intestinal bleeding, mouthwash and to improve growth and blacken hair (Rosdiana 2009, accessed on October 20, 2010) in Sunarto et al (2013).

Model

A model is a pilot that contains elements are simplified to be replicable (if necessary). Decision-making itself is a sequential process that requires the use of models quickly and correctly. The importance of model in a decision making, among others, as follows:
1. To know whether a single relationship of the elements has a relevance to the problem to be solved.
2. To clarify (explicitly) about the significant relationship between the elements.
3. To formulate hypotheses about the nature of relationships between variables. This relationship is usually expressed in mathematical form.
4. To provide management to the decision-making.

Models are a means of simplifying and analyzing complex situations or systems. So, with model, such as complex situations or systems can be simplified without omitting essentials things in order to simplify understanding. The making and the use of models can provide a management framework in decision making. Achmad et al (2016)
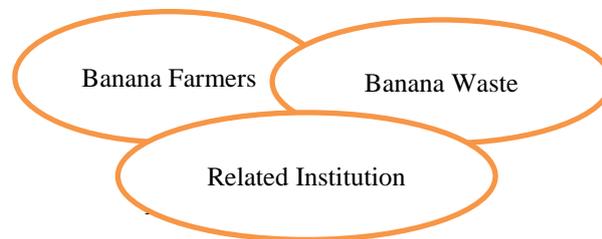
Economic Empowerment

Empowerment comes from the power, English, which means power or strength. According to Paul (1987) in Aris (2014), empowerment is means equatable sharing of power so that increases political awareness or weak group power and enlarges, influence on the processes and results of the development.

 Community empowerment is an effort to build, strengthen, and develop institutions and followed by a sustainable accompaniment in order to reach independence (Suhartini, et.2005). In Aris (2014), empowerment is a process and a goal, a process of empowerment is a series of activities to give power, to the weak group, to gain access and equal opportunity as the powerful groups gain. While, empowerment as a goal can be seen as the result of a process to create a society which is capable and empowered, self-powered, able to fulfill the needs of their own life so that get a better life economically, physically, and socially.

Framework of Economic Empowerment Model with Industrialization Approach Using Banana Waste as Raw Material
The purpose of this model is a model which is designed to assist the economic empowerment of people / farmers to overcome the waste problems. In this case, the banana stem through the industrialization approach, so as to encourage the emergence of special products by involving the relevant institutions in an effort to increase the income of farmers

Banana Farmers   Banana Waste

Related Institution

Picture 1

CONCEPT
Strategy of economic empowerment model with industrialization approach from waste of banana plant using 3 approaches such as:
1. Manage the pattern of banana cultivation on farmers in order to provide a higher economic value.
2. Manage the waste of banana plants in order to create economic value for the community / banana farmers.
3. Manage cooperation with related institutions in the effort of solving the problems of banana plant waste.

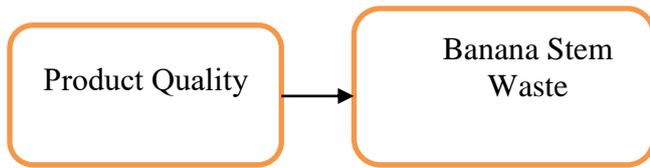 The main considerations to develop community empowerment model are:
1. Banana is a commodity that is easy to be cultivated and developed in Indonesia. Banana is an important trading commodity which has domestic and foreign markets, but related to its quality and productivity. Banana is influenced by several factors (product quality, virus / pest) that attack banana trees so that the fruit can not compete and only have low selling value, which needs to be improved.
2. Banana farmers still do not care about quality problems that make them facing various obstacles in developing their market.
3. Banana farmers still do not care about the problems associated with waste from banana trees, because they do not know about banana waste can be processed into commodities and economic value that will improve the environment and protected forests.
4. Banana farmers as banana growers have not been able to obtain sufficient income to cover their cost of living, that they have been planting lately.
It is necessary to do cooperative efforts between related parties in overcoming the problems of banana plant waste.

Product quality

According to Kotler and Keller (2009, 4), product is anything that can be offered to the market to satisfy a desire or need, including physical goods, services, experiences, events, people, places, property, organization, information, and idea. Product is the first and the most important element in the marketing mix. Product strategy requires coordinated decision making in product mix, product line, branding, packaging, and labeling. Kotler and Keller (2009: 31).

Framework

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┌─────────────────────┐        ┌─────────────────────┐
│                     │        │    Banana Stem      │
│  Product Quality    │───────▶│      Waste          │
│                     │        │                     │
└─────────────────────┘        └─────────────────────┘
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Framework

Research Approach
The approach used in this research is a participatory approach both for the first and the second year in order to obtain qualitative and quantitative data to provide a more complete explanation to the scope of the issues being studied.
Participatory (qualitative) approach is directed to be grounded for the exciting case study that is revealed as the supporting PEPP (Farmers Empowerment Economy of Banana) model for banana farmers community which become the outcome of the research.

Sample Determination

The methods of collecting data used by the researcher are primary data and secondary data. Primary data was obtained through questionnaires and focus group discussions (FGDs) with relevant stakeholders based on a prepared list of questions, as well as on-site observations. Secondary data is obtained through daily and weekly reports, writings, and literature related to the topics covered, such as the central statistics agency, the internet, previous research reports of other reliable sources. The number of respondents can be seen in Table 1:

Table 1
Number of Farmers as Respondents

District	Village	Respondents
Aceh Besar	Jantho	52
Pidie	Muara Tiga	52
Bireun	Juli	26

Source: Processed researchers, 2017

Data analysis technique
Analytical techniques used in this study in accordance with problem solving and research objectives, the data used as supporters associated with exposure to behavior and statements as well as perceptions of respondents. In this case, banana growers, the data in general in the form of qualitative data, while the data in the form numbers (quantitative) will be used to complete and assist the descriptions of qualitative data.

Data analysis using multiple regression with equation as follows:
$$y = a + bX$$
Where :
y = Banana Waste
x = Product Quality
a = Constants
b = Regression Coefficient

Research Results
1. Descriptive data related to supporting qualitative analysis

• Descriptive analysis of product quality of banana stem, banana stem waste, and protected forest. Data descriptions related to waste handling with product and forest quality are used to enrich the discussion, so it will be known how the condition which is being researched after the researchers conducted a survey to the research location.

Table 2

Descriptive Statistics

	Mean	Std. Deviation	N
LBP	1.4692	.75932	130
KP	6.4923	3.49140	130

Source : primary data, 2017
Noted : LBP (Limbah Batang Pisang)
 KP (Quality of product)

Based on Table 2, it is known that the average waste of banana stems (LBP) 1.46, Quality of Banana stem Product (KP) 6.49.

Economic Empowerment Model with Industrialization Approach Using Banana Waste Raw Material

To answer the purpose of research based on existing problems, a model that can be used for handling waste banana stems is needed, so as to reduce environmental pollution around it. Based on these conditions, the model of economic empowerment with industrialization approach is arranged as follows:
This economic empowerment model is aimed to achieve two things, such as:
1. To assist the community in solving the difficulties that they are facing, creating the community's independence in order to be able to solve their own problems, develop to the potency of the community to manage the resources around them.
2. To provide economic value-added to the banana farmer through industrialization approach with the efforts to increase productivity and product quality. Improvement of productivity can be achieved by improving the cultivation technique to the superior quality banana, and improvement of product quality can be achieved through handling the factors that makes the decreasing quality of banana (virus / pest / banana stem rot). The use of post-harvest technology with industrialization approach, so as to increase the economic value-added of waste banana stem. Through, economic empowerment for banana farmers with industrialization approach stakeholders need to support banana farmers, and based on these conditions, then the model of economic empowerment is made as follows:
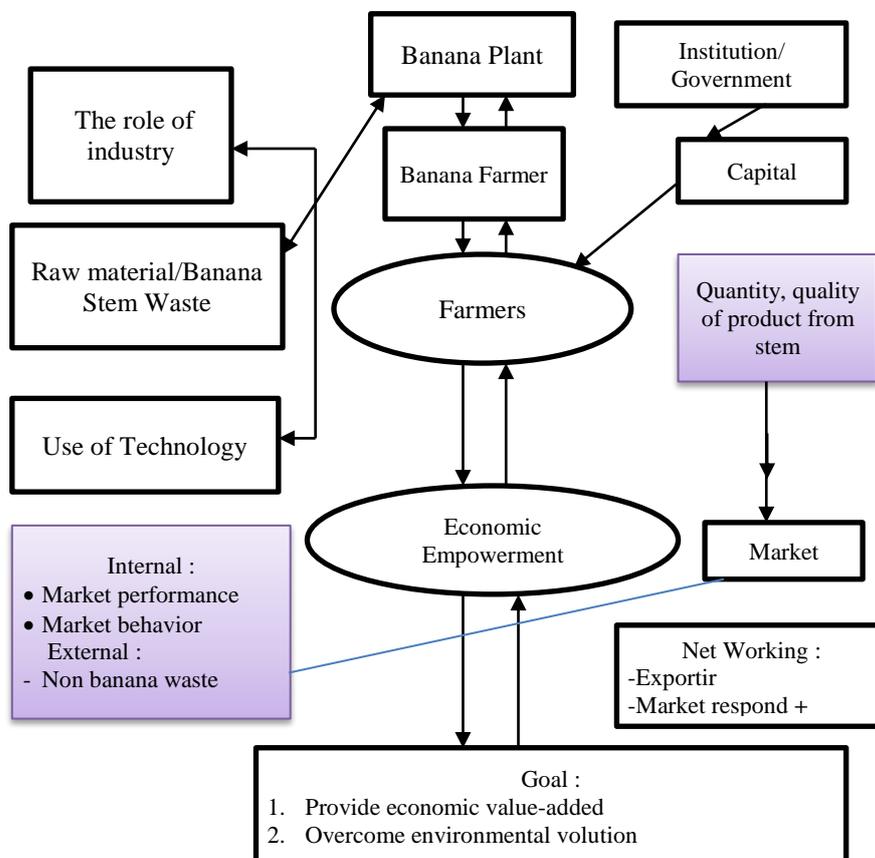
Picture

Economic Empowerment Model with Industrialization Approach

Information :

: Problems related to banana waste
: Economic empowerment
: Others
: Process flow and feedback flow
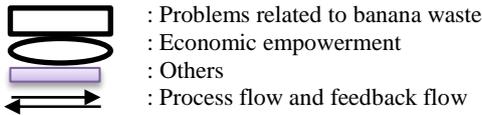
Based on the figure, can be made economic empowerment model with industrialization approach with the aimed to achieve the following:

1. To provide economic value-added to the banana farmers through industrialization approach with efforts to increase productivity and product quality.
2. To increased productivity which can be achieved by improving the cultivation technique to the banana that has superior quality.
3. Improvement of product quality through handling the factors causing decreased quality of banana (virus / pest / rotten banana stem disease)
4. The use of post-harvest technology with an industrialization approach that can reduce banana waste and increase the economic value-added of the waste with the support of stakeholders / industry and can reduce environmental pollution.

2. **Quantitative Analysis**

Quantitative data analysis is used to complement and assist the description of qualitative data presented in tabular form.

Y = Banana waste
X = Product Quality

• **Inferential Data Analysis**

By using regression analysis, the researcher will measure the dependent variable based on the change of the independent variable. Regression analysis is used to forecast changes in relationships that will occur based on the relationships that existed in the previous period of time. Here is the equation model in this research:

$Y = f(X)$
$Y = a + bX$

▪ **Simple linier regression equation model**

This study used one free variable obtained (product quality of banana stem), one dependent variable (banana stem waste) and Focus Group Discussion (FGD) results. The result of data processing for equation model using SPSS program 17version is shown in the following table:

Table 3

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	1.866	.136		13.730	.000
KP	-.061	.018	-.281	-3.310	.001

a. Dependent Variable: LBP

Source: Primary data processed, 2017

Based on the value of Unstandardized Coefficients Table 5.2 then obtained model of regression equation using standardized regression coefficient, that is

Y = 1.866 - 0.061 KP
SE: KP (0.018)
t: - 3,310 *
Sig: 0.01 <0.05
Description: *) = real at α = 5%

Based on Table 3, it can be explained that partially Product Quality of banana (X_1) -0,061 unit has negative effect to Banana Wastes (Y) with standard error 0,18 unit.

This means that high or low quantity of banana stem waste is not affected by the quality of banana stem products. Hypothesis proposed in the opposite direction, so that to overcome the waste of banana stem it can be done by the efforts of improving the quality of the product from the banana crops that are harvested. So, if the quality of the banana stem is good, then the good banana fruit harvest, and the quality of banana stems as will also be good, so that it can be processed into products that have high economic value.

▪ **Simple correlation analysis**

Table 4

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.281[a]	.079	.072	.73161

a. Predictors: (Constant), KP

b. Dependent Variable: LBP

Source: Primary data processed, 2017

Based on summary model Table 4, coefficient correlation product quality of banana stem with banana stem waste has a value of 0.281 with a real level of 0.5. This shows that there is a weak correlation between the quality of banana stem product and banana stem waste. It means that if the quality of banana stem product is improved, it is expected to reduce the waste of banana stem, so that the people receive positive impact from the utilization of banana stem waste.

CONCLUSIONS AND RECOMMENDATIONS
1. Conclusion
Based on the results of the research and data analysis as well as the FGD results, the researcher can draw conclusions, as follows:
a. The quality of banana products especially banana stems in three areas of NAD such as Pidie, Bireun and Jantho have different conditions due to several factors. Among others :
- For Jantho area (Aceh Besar District), the problems faced by banana farmers are unfavorable conditions for planting banana. This is the reasons why the result of banana products at Jantho region decreased due to banana trees affected by yellow disease (wilt). So, to utilize banana plant waste in the area is not possible anymore unless there is another solution given by the relevant agencies to handle the problem.
- For Pidie area, banana fruit harvest is in good condition, but sometimes the result is also not good. It is caused by pest / virus that often attacks fruits of the banana.
- For Bireun region, the quality of banana products in this region is very good. It was visible, when the researcher did a survey to the location, the banana harvest was in good condition. At a glance the quality of banana stems in the Bireun region is also good, but the utilization has not been optimal. Farmers just throw away, neglect, rotten the stem, because according to them, there is no counseling related to the economic utilization opportunities that can be accepted by farmers.

b. How to make banana stem waste has economical value.
After entering the field of study, the researcher conducted a dialogue / discussion to the community, especially the banana farmers in the three areas, and found that the utilization of banana stems has not been maximum which means that after the banana is cut, the stem is not used but to be decayed, thrown away, although it can be used for fodder.
Another problem arises that there are some banana trees is attacked by pest / virus / yellow withered disease, so that the quality of the banana stem is not good. The lack of related information about the utilization of banana stem waste that have the selling power and economically can increase farmers' income, because there is no role of agricultural extension about the utilization of banana stems.

2. Suggestions
Based on the above conclusions, it can be suggested / inputs for related parties, that:
a. A routine counseling should be given to banana farmers related to the quality of superior banana, so that if it is marketed to other regions it will have a great economic value.
b. A counseling related to the utilization of banana stem waste should be conducted after the harvest time is completed. So, it will reduce environmental pollution besides providing the farmers with additional economic value out of the waste that can be used as intermediate goods and finished goods.
c. The role government, in this case, department of agriculture and industry is needed especially in the fulfillment of high quality banana seedlings as well as a good marketing system for agricultural products, especially bananas.
d. The positive response of the local government to the home industry activities around the farmers by finding technique of processing banana stems waste into semi-finished products and finished goods.

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Beureukat[1],
[12]*Faculty of Economics National University, Indonesia*

Rahayu Lestari[2]
[12]*Faculty of Economics National University, Indonesia*