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NES Model for MOTIN-Instant Noodle Production in Bantur Regency, Indonesia

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ABSTRACT

Xanthosoma sp. is among the six most important root and tuber roots because its rich source of carbohydrates, essential amino acids, vitamins, and minerals for human diet. Despite its importance and wide spread production, improved breeding and processing of Xanthosoma sp. or called cocoyams could greatly its value and utilization Bantur regency were contributed as the biggest supplier of tannia cocoyam in East Java which is total area are 158,9 km². Alternative way to increase the utilization of it is by processed to be basic ingredients according to needs society. Fermentation process was bring to reduce itchinness of Tannia cocoyam, and call Tannia cocoyam-modified flour or MOTIN, which contain proten 3.085 % and carbohydrate 86,59%. when processed into one of the types of food that are of interest to all ages namely instant noodle, the protein increased up to 7,13 % and carbohydrate decreased into 77,10. By build of Nucleus Estate Smallholder (NES) would contribute to raise the values of cocoyam within sale calculation of instant curly noodles per package (200 grams) can reach a price of IDR 3750 competitive enough to be equated products on the same type and size.

Keywords: NES/Tannia cocoyam/Modified Flour/Instant Noodle/Bantur Regency.

1. INTRODUCTION

Almost all of developing countries roots and tubers such as cassava (*Manihot esculenta*), sweet potato (*Ipoema batatas*), yam (*Dioscorea* sp.) and cocoyams (*Colocasia esculenta* and *Xantosomasagitifolium*) are important household food security and income corps. There are contain fiber and starch which provide energy and satiate consumer. *Xanthosoma* sp. is an annual for its edible, cormels, and leaves in the tropics and sub-tropics [5]. It originated in the tropical Americas, Africa especially West Africa, Southeast Asia and the Pacific Island. They are important food crop for more than 400 million people worldwide, particularly for poor resources-rural populations [3]

One of abundant root crops in East Java, Tannia cocoyam (*Xantosoma sagitifolium*), contain special compound which called glucomannan that considered as the main important compound for making glutenious food. The high glutinous compound found in this crop is assumed could be used as a raw material for making a noodle. It can establish an elastic and good texture noodle. Therefore, flour made from *Tannia cocoyam* able to

replace or substitute wheat flour in noodle production particularly for small scale industry which runs by household at rural area (Badan Litbang Pertanian, 2011).

Recently, main problem could face is lack research involving farmers, suppliers and the government in managing local resources, especially to improve welfare and selling value. Cooperation between home industry and the nucleus, the center of social activity, truly needed and previously has been done for making noodle from cassava in Blitar Region. The main goals are to support activity and income improvement of household farmer at rural area, increase added value of the field, efficient used of land, and to reduce the dependency of wheat flour for food industries. At the moment, the sustainable-economic of the farmer shows an increase in public interest as entrepreneur and significantly reduce unemployment. This promising result was continued in another place, Bantur Regency, whose part of *Tannia cocoyam* supplier from East Java. The extension service carried out as house hold level for making Modified Tannia Flour (MOTIN) is very

important. The best method for making MOTIN will be used to produce noodle. Introduction the processing of noodle to the nucleus will be done after the execution of the white noodle. The establishment of cooperation between household level and the nucleus will be carried out similarly with the previous project. A participatory research action will be carried out to extend the NES model and staffs of Center Food and Feed Sovereignty, Tribhuwana Tungadewi University will become the facilitator in this program.

The aims of this paper is to report and define the activities result of increasing and sustaining income of cocoyam farmers in Bantur Regency, to find those factors which contribute on successfully program. This paper was also explain economic evaluation and behavior alteration of the society by this program.

2. MATERIAL AND METHODS

NES (Nucleus Estate Smallholder) model was bring as partnership model between farmers as the raw material producers and final product industries. In this model the private developers (the Nucleus) will prepare some plots of lands for the smallholders, and once the plots were planted and harvested, the yield will be handed over to the smallholders. The smallholders (Plasm) would then further develop these plantations under the supervision of developers, who would then be required to buy the product from the smallholders (Jensen *et al*, 2009). Research design for the program utilized The NES model extension service for the processing of MOTIN using this endogenous organism is necessary and will be extended at Bantur District Malang Region East Java Province Indonesia with the following stages. The schema of plasm activity was shon in Figure 1.

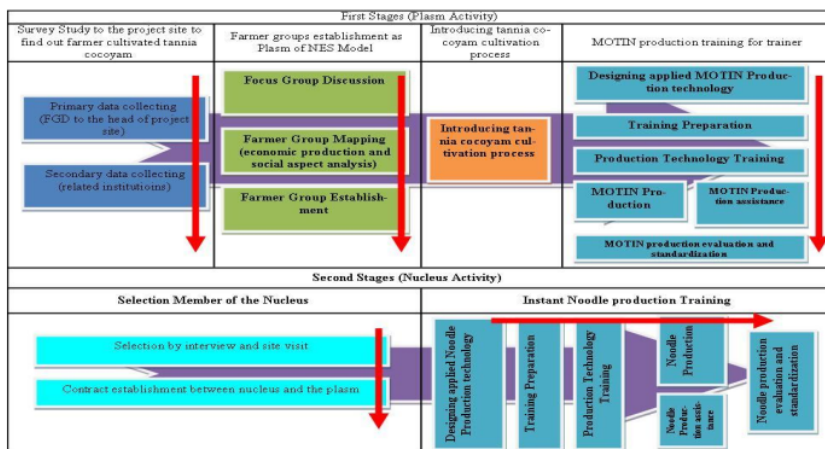


Figure 1.Strategy of NES for increase and sustaining income at Bantur Region.

3. RESULTS AND DISCUSSIONS

Motinproduction.

The MOTIN production process was designed to be learned in a short time and easy by the member of the work group which consists of cassava farmer family member with low-grade education background. The MOTIN production design which developed and designed by Center of Food and Feed Sovereignty Tribhuwana Tungadewi University Malang can be run with low initial capital. Main process of the Motin production was fermentation process. One of the success factors of fermentation process was the microorganism or the culture stock.

However, the MOTIN production design was used a spontaneous fermentation without addition of any specific microorganism. This design makes the work groups free from dependency of the specific culture stock. The result known that the plasma able to process 50-80 kg of fresh cocoyam into MOTIN. Yield of MOTIN is about 27.8% from starting weight of raw material, and in every process can produce 13.9 – 22.24 kg.

Instant Noodle Production Training

Training on making noodles with MOTIN-based ingredients is done at the place of the father's brother. He is one of the partners appointed as the

nucleus in charge of plasma. The intended plasma is a cocoyam farmer. The production process of making MOTIN in that place, so that MOTIN's processing into noodles is done at once. Nucleus also contributed to marketing noodle products that had been made labeled the entrepreneur. Entrepreneur under the guidance of the UNITRI SEARCA team. The labeling of the business unit of Mr. Mashudi named Radja was carried out after obtaining a company permit.

Training on making noodles was attended by the Bantur community and government officials in

Bantur sub-district who were interested in processing motin into instant noodles. The training was delivered by Mr. Budi Santoso as the head of the Searca project who was accompanied by a lecturer team of the Agricultural Industry Technology study program and a team of UNITRI Food Sovereignty Study Centers. In the training it was conveyed that by using motin in making noodles, it could reduce the amount of flour as raw material for making noodles so far. This makes the production efficiency of noodles increase which results in an increase in profits in the manufacture of noodles. The concepts shown in Figure 2.



Figure 2. Cocoyam, MOTIN and instant noodle from MOTIN.

Income Evaluation Based On Noodle-MOTIN Production.

Cocoyam yields are generally sold in wet conditions at a price of IDR 3000to 3500 per kilogram. Bantur Regency with the maximum amount of cocoyam harvest that reaches [1]. One of the main advantages of precision crop production is that site-specific of yield by produce the flour and or noodle may increase added value off cocoyam utilization. To increase sales, the quality of the noodles produced by the entrepreneurs is analysed. The following are the results of the analysis of instant noodles for entrepreneurial entrepreneurship below. The level of feasibility calculation of $R > 1$ is obtained which indicates that the cocoyam-based instant noodle making business is feasible [6]. Price of instant noodles based on business feasibility calculation reached a price of IDR 5500. The results of the switch from selling fresh cocoyam to MOTIN, profit value show in margin raise up to 1,120 dollars. If MOTIN is sold in the form of instant noodles per

kg it will get a profit of 4 dollars (Table 1 and Table 2).

Table 1. Calculation of the price of instant noodle production

| Partial Budget | | | | |
|--|---|-----------------------------------|-------------------------------|--------------|
| Name | NES MODEL MOTIN | | Date | 14 June 2018 |
| Description 8 of Analysis | Switch from selling fresh Cocoyam to Motin. | | | |
| Increases in Net Income | | Decreases in Net Income | | |
| Increase in Income | | Decrease in Income | | |
| MOTIN (8000 kg/ha @ \$0,53) | \$4,267 | fertilizer (ha) | \$20 | |
| | \$0 | Seed (ha) | \$10 | |
| | \$0 | Labor (maintenance cultivating) | \$20 | |
| | \$0 | | \$0 | |
| | \$0 | | \$0 | |
| | \$0 | | \$0 | |
| Total Increase | \$4,267 | Total Decrease | \$50 | |
| Decrease in Cost | | Increase in Cost | | |
| Labor (\$1/100 kg in 3 days for each person:8) | \$28 | | | |
| electricity (for grinding) | \$5 | fresh cocoyam (pereach harveting) | \$3,200 | 4 |
| equipment maintenance | \$70 | | \$0 | |
| | \$0 | | \$0 | |
| Total Decrease | \$103 | Total Increase | \$3,200 | |
| Increase in Net Income | | \$4,370 | Decrease in Net Income | |
| Change in Net Income | | \$1,120 | | |

Table 2. Claculation the feasibility of instant noodle production

| Partial Budget | | | | |
|------------------------------|--|--|------|-----------------|
| Name | NES MODEL MOTIN | | Date | 5 December 2018 |
| Description 8 of Analysis | Switch from selling fresh Motin to noodle for 1 kg | | | |
| | | | | |

| Increases in Net Income | | | Decreases in Net Income | | |
|-------------------------------|--|--------------|-------------------------------|--|------------|
| <i>Increase in Income</i> | | | <i>Decrease in Income</i> | | |
| Motin (\$0,53/kg) | | \$1 | | | \$0 |
| | | \$0 | | | \$0 |
| | | \$0 | | | \$0 |
| | | \$0 | | | \$0 |
| | | \$0 | | | \$0 |
| | | \$0 | | | \$0 |
| Total Increase | | \$1 | Total Decrease | | \$0 |
| <i>Decrease in Cost</i> | | | <i>Increase in Cost</i> | | |
| wheat flour | | \$0 | Noodle (1 kg) | | \$7 |
| motin flour | | \$0 | | | \$0 |
| material to made noodle | | \$2 | | | \$0 |
| | | | | | |
| | | | | | |
| | | \$0 | | | \$0 |
| Total Decrease | | \$2 | Total Increase | | \$7 |
| | | | | | |
| Increase in Net Income | | \$3 | Decrease in Net Income | | \$7 |
| | | | | | |
| Change in Net Income | | (\$4) | | | |
| | | | | | |

2 Crop production and its wide-spread utilization in practice is an economic decision from farmer side when they have to invest their capital. It is also important to consider the changes in product prices as well as the rate of interest of credits so that farmers can make a reasonable decision. By applying new technology, noodle-based crops technology, would be can speed up the diffusion and wider application of the innovation is its profitability [4]. [3] enhance that increasing of income would obtained regards to a firm's relationships with stakeholders particularly. It will touch off of market pricing during sales take place.

4. CONCLUSIONS

Community service activities in Bantur Regency which aim to increase the value of cocoyam diversification have been carried out. As said before, the first research would carried out in Blitar Region which the goals are to welfare sustaining and increasing of income value on cassava farmer. For now, within same

program but in different resources, *Tania cocoyam* modification flour would carried out. The acquisition of motin flour is quite high, which ranges from 13.9 - 22.4 percent. The price starting from IDR 3000 to IDR 3500 from the price of raw materials is now higher (IDR 5500) after processing. Routine mentoring activities carried out with the facilitator, UNITRI SEARCA TEAM has succeeded in making the modified cocoyam flour (MOTIN) manufacturing program one of the alternative products processed by cocoyam which can be marketed directly or in the form of advanced processing, namely, instant noodles. The calculation of business feasibility, the level of feasibility calculation of R> 1 is obtained which indicates that the cocoyam-based instant noodle making business is feasible.

AUTHOR CONTRIBUTIONS

The first author contributed in collecting primary and secondary data, assisted by the third and fourth authors. The second author contributed in processing the data and

pouring it into a draft article according to the template. The fourth author is also tasked with finding information related to the existence of ICOMS at UMY.

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