

## **IBM: The Optimization Of The Mangrove Fruit Powder Society Group In Sidangoli, West Halmahera, North Moluccas Province, Indonesia**

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**ABSTRACT:** The program of IPTEK has been done to the society of mangrove fruit powder home industry in Sidangoli as: 1) Execution of spacious study phase have been executed better and get result of that Socialization target group and counselling executed at country side of Sidangoli have been executed better, 2) Execution of phase test antecedent have been executed enough is fluent, so that have earned in flour production of mangrove 3) Society Respon to socialization and counselling of technology making of flour of mangrove at country side of Sidangoli show 86% responder express that socialization technique making of flour of mangrove very clear and is easy to comprehended by responder, 95% expressing got easy materials and appliance, 95% responder express procedure making of flour of mangrove simple and easy and 100% responder ready to develop technique making of flour of mangrove in Sidangoli. Pursuant to result of execution of socialization and counselling of technique making of flour of mangrove can be suggested by some: 1) Require to be conducted by adjacent follow-up of flour production of mangrove in Sidangoli. 2) Require to be conducted adjacent and effort independence facilitated through capital employed aid and flour production of mangrove in industrial scale of working team with local government side irrelevant institution.

**Key Word:** group society, worker, mangrove fruit powder.

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### **I. INTRODUCTION**

North Moluccas Province is one of the provinces that possess the longest shoreline since, geographically, this province is an archipelago province. One kind of ecosystem in seashore area is mangrove ecosystem. Mangrove forest is a vegetation community in tropic sea, which is dominated by various kind of mangrove trees that are able to grow in the saline tidal water, muddy, or sandy (Bengen, 2002). One of sea forest formation that has a high productivity and high biodiversity is mangrove forest. Mangrove vegetation is a part of sea shore ecosystem that provides productive natural resources which can be used as the source of food, mineral and energy mining, and tourism object.

The North Moluccas seashore formed from several isles has a high potential mangrove vegetation. The distribution of the vegetation covers the area of South Halmahera seashore, West Halmahera seashore, and North Moluccas isles seashore. The potential of mangrove forest in South Halmahera seashore, based on the survey of UNESCO (1993) was 0.63% of the total mangrove vegetation (100/ha) of Moluccas seashore and North Moluccas seashore (Marimoi, 2004).

Tolangara, et al. (2012) confirmed that the seedling composition of mangrove in Tuada village of South Jailolo of West Halmahera consisted of *Rhizophora apiculata*, *Sonneratia alba*, *Bruguiera gymnorrhiza*, *Xylocarpus granatum*, *Xylocarpus moluccensis* dan *Nypa fruticans* (see Appendix). Based on the composition of mangrove vegetation in Payo village seashore, it is found 4 kinds of mangroves, namely *Rhizophora apiculata*, *Bruguiera gymnorrhiza*, *Sonneratia alba*, and *Avicenia alba*. These four mangrove species is categorized as the real mangrove.

Based on the composition of mangrove vegetation in Sidangoli Gam village of Jailolo, it is found 7 kinds of mangroves, namely *Sonneratia alba*, *Rhizophora apiculata*, *Rhizophora mucronata*, *Ceriops tagal*, *Bruguiera gymnorrhiza* dan *Xylocarpus granatum*.

West Halmahera regency possesses 281 km long seashore, in which it is also the estuary of Ake Lamo and Ake Ibu rivers. It is found 5 species of mangrove vegetation, namely *Rizophora* sp, *Avicennia* sp, dan *Nypa* sp, and *Bruguiera* sp. The average of the stem circumference is 39.95 cm. The average length of the trees is 7.68 m tall, the salinity is 28-30 ppm. The condition of the area is muddy and sandy with pH 7.0, while the high tide can reach 10-70 cm with semi diurnal tidal type.

Sidangoli Dehe village possess a wide potential mangrove forest and is spread out to all of the seashore area. However, the mangrove forest product is commonly used as firewood, medication, and land conversion as a settlement, industry, and fishery. Whereas, mangrove product might be beneficial to be developed as alternative food source substituting rice which provides carbohydrate and industry materials, especially for surrounding people. It is because of the lack of comprehension and technology in processing mangrove. The development of knowledge and technology of mangrove processing might improve the mangrove processing skill and society welfare in terms of the society income. Since the source of mangrove fruit is not the main problem in the production of alternative food, in this case mangrove fruit powder, in Sidangoli, thus it is necessary to improve the society skill related to the mangrove fruit manufacturing, food secure quality and expediency program through

### **IBM mangrove fruit powder society group in Sidangoli, North Halmahera Province.**

The program is held by two groups of family in Sidangoli Dehe village and Sidangoli Gam village. Each group consists of 4 members who possess cooperation primary education background. The first group came from Sidangoli Dehe village, which is led by Nurfat Husain and the second group came from Sidangoli Gam village which led by Nurha.

The technology and training program for people through the training and technology transfer guidance in processing mangrove fruit to become an alternative food source in form of mangrove fruit powder, aimed at helping the society to innovate a new food source from surrounding material. It is expected that the product of fruit powder is good, safe to consume, and nutritious. Besides being trained to produce mangrove fruit powder from mangrove fruits, people are also trained to be able to process various food product from mangrove fruit powder, such as layer cakes, *pastris*, *onde-onde*, and porridge. It is expected that the program can improve the economics of the society.

Based on the survey result and focus group discussion with people from Sidangoli village and the cooperation, the general problem faced are:

- a. the lack of knowledge about mangrove food production while there are many mangrove fruit available in Sidangoli village.
- b. there is no training activity from local government and private institution related to mangrove fruit production to mangrove fruit powder.
- c. most people do not know the advantage of mangrove, which can be produced as food especially for the fruit. Therefore, many fruit production are wasted. The people's income and welfare are relatively good if it is analyzed based on the available natural sources potential, especially from the alternative food product development from mangrove fruit.

The mangrove variety in Sidangoli seashore is relatively high. It can be seen from the number of species found which are used as the sample of the study, they are *Rhizophora stylosa*, *Sonneratia alba* and *Nypa fruticans*. The process of mangrove fruit powder production from *Rhizophora stylosa* and *Sonneratia alba* follows several steps, they are: (1) the fresh fruit are boiled for about 3 hours before peeled and immersed into ashes for 3 days to eliminate the toxic, (2) the water and the ashes are to be replaced every day at the same time. If the fruit are immersed at 8 am then the ashes and water should be replaced at 8 am, (3) after being immersed, the fruit are dried and grinded into powder, and (4) the powder can be used to make several of food.

Based on the information and the problems faced by people as well as the above mentioned theoretical, a solution named transferring knowledge related to mangrove fruit processing to be mangrove fruit powder which has economic value and edible is offered. The aimed of the program are:

- a. Mangrove fruit processing to be mangrove fruit powder skill.
- b. Producing edible, safe, and nutritious mangrove fruit powder.
- c. Creating better income from the production of mangrove fruit powder and the various food of mangrove fruit powder.

## **II. METHOD**

The methods of the program are:

- a. Mangrove fruit production training to be mangrove fruit powder.
- b. Mangrove fruit powder training to be various food and cake.

The evaluation is done by seeing the mangrove fruit production technique to produce mangrove fruit powder by people based on the training activity. The program will be succeed if people can produce mangrove fruit powder and various food from mangrove fruit based on the procedure.

### III. FINDINGS AND DISCUSSION

#### Activity Description

This section provides the data of the activity of the society service program that consists of several steps, they are: (1) Mangrove fruit production to be mangrove fruit powder and various food, (2) training, and (3) monitoring and evaluation.

#### 1. Mangrove fruit production to be mangrove fruit powder

In this step, the training participants are trained to process mangrove fruit into wheat-flour substitution, work procedure, and food recipe from mangrove fruit powder (document). The activity was done on 27<sup>th</sup> September 2013 in Sidangoli Dehe village and Sidangoli Gam village.

#### 2. Training

This step was done after the previous step done. The training activity was done by facilitating the participants to produce fruit powder from mangrove fruit and various cakes from mangrove fruit powder. This step was done twice on training session and monitoring and evaluation session on 27<sup>th</sup> September 2013.

#### 3. Monitoring and Evaluation

This step was done twice. The first one was done on the training day by delivering questionnaires and doing interview to the participants. The second one was done on the training day by observing the improvement of the participants in practicing the technique of powder processing into cakes. The feedback from the participant is showed in following table 1.

**Table 1. IBM Participants' Response**

Activity	Nurfat Husein	Nurha
1. New technology	Yes	Yes
2. Easy work procedure	Yes	Yes
3. The materials and the tools are easy to find	Yes	Yes
4. The powder is satisfying	No	No
5. any plan to modify the technique of mangrove fruit powder processing	Yes	Yes
Suggestions	It is expected that the fruit powder is floss and bleach.	Coarse powder might affect the cakes texture

Based on the above table, it can be seen that the technology trained to the participants can be accepted and implemented well. However, the participant were quite not satisfied with the powder result and thought that the processing technique needs some improvement, especially for the colour and the structure of the powder. The following activities towards this program are: (1) reconstruct the procedure of powder production, (2) developing better mangrove grind tools so that the result of the mangrove fruit powder can be floss, (3) create new recipe of food from mangrove fruit powder.

Through such program, the society participation, especially for the coastal society, towards mangrove management might improve. The involvement of the society in every step of mangrove rehabilitation program might strengthen the cooperation, independence, and interaction among others so that it might create a fishermen organization which has strong bargaining position. The development and the improvement of this organization is an effective and efficient stage in the implementation of mangrove rehabilitation program.

The alternative business development potential based on local sources is not optimized yet. Therefore, an alternative economic business development is needed to encourage the development of new jobs for the society. The development of mangrove ecosystem management policy can be done through the development of alternative food and local food endurance.

### IV. CONCLUSION

Based on the implementation of education and technology program for local people, especially for mangrove fruit powder society group, it can be concluded that:

1. An education and technology program in form of mangrove fruit processing into mangrove fruit powder and various food had been implemented .
2. Generally, the technique of mangrove fruit powder processing can be accepted by people since the procedure is easily implemented.
3. The response of the people towards the socialization of mangrove fruit powder processing technology in Sidangoli village showed that 86% respondents stated that the socialization was clear and easily understood, 95% respondents stated that the materials and tools were easily found, 95% respondents stated that the procedure of fruit powder production was easy and simple, and 100% respondents are willing to improve the technique of mangrove fruit powder production in Sidangoli village.

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