Community partnership program (CPP): family prosperity construction (FPC) group of Rasi village, Ratahan district, southeast Minahasa: training on cavendish banana (*musa acuminata, sp*) flour production and *m. acuminata* flour-based biscuit

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Abstract. Cavendish banana *Musa acuminata*, is one of the endemic plants in North Sulawesi, particularly Minahasa. The fruit is generally consumed after fried or boiled. Nowadays *M. acuminata* can be processed to make flour and used as material of many different fresh or dried cookies, such as cake, brownish, biscuit and many others. According to Sondakh (1990), *M. acuminata* flour contains 80.89% carbohydrate, 2.89% protein, 0.67% fat, and 2% coarse fiber. Therefore, the potential of *M. acuminata* flour processing gives more variable development opportunity that indirectly involves in accelerating the national food security achievement. The output target of this Community Partnership Program (CPP) is to make all Family Prosperity Construction (FPC) stakeholders be able to work as *M. acuminata* flour-based biscuit entrepreneurs using box packaging agreed, and all FPC stakeholders can manage the business cash flow well.

1. Introduction

North Sulawesi as the gate of Eastern Indonesia has a variety of endemic plants, one of which is Cavendish banana *Musa acuminata*. It is a typical banana in North Sulawesi, especially Minahasa region. The consumption rate of *M. acuminata* recently rises in North Sulawesi because of its benefit, and it is generally consumed in fried or boiled form.

In Manado, now this processed product starts being served as a menu in star hotels, and also becomes favorite menu in several food businesses from vendors to restaurants in shopping centers. In the past, before *M. acuminata* was commercially sold, this banana could be found at certain times, such as padi harvest ceremony, thanksgiving ceremony, and social gathering.

Processing of *M. acuminata* to make flour has more variable development opportunity that indirectly participate in helping accelerate the national food security program achievement. Food security is done to maximize production and consumption of local carbohydrate source beyond rice and common flour that becomes government’s priority in diversification. This effort is not only to prepare variable and nutritive food, but it has also been developed to the benefit consideration for human health.
Based on previous study (Sondakh, 1990), M. acuminata flour contains 80.89% starch, 2.89% protein, 0.6% fat, 1.83% total glucose, 11.99% water, and about 2% coarse fiber. It means that the potential of M. acuminata development as carbohydrate-based alternative food is very high since it has high carbohydrate content and low total glucose, so that it is safe to be consumed by people with Diabetes mellitus. Unfortunately, people in North Sulawesi have not known how to make M. acuminata flour yet, while it can be used to produce various processed products, such as cake, biscuit, and brownish.

The stakeholders of this Community Partnership Program (CPP) are small entrepreneurs of fresh snacks (steamed and fried products) and dried products, such as crackers, and retailers listed as members of Family Prosperity Construction group in subvillage 2 and 3 of Rasi. Snack production and sales have developed since 1998 as a business followed by many women in Rasi village, southeast Minahasa regency. The sales can give income contribution to the family by taking advantages of female’s spare time to do the business.

Based information from Cooperative Services (CS) and Small Medium Enterprise (SME), there are about 6 snack shops run by rural women (CS and SME of southeast Minahasa regency, 2013). This condition indicates that this unformal business sector is capable of increasing the food image made from M. acuminata flour or local plant materials, and providing business opportunity, especially the rural women. The business development can raise the rural economic potentials and contribute to the family economic and reginal economic development.

Other factors supporting this business development is the geographic position of Rasi village, Ratahan district, as passing route among regencies in North Sulawesi and among provinces. M. acuminata flour and its biscuit product is one of the food souvenirs for people who pass through the area. It, therefore, needs attention because it can become a typical icon of the southeast Minahasa regency and able to increase local food image of North Sulawesi in general.

M. acuminata flour processing and biscuit sale businesses are mostly done by women as an informal sector business, since these have the following characteristics:
1. all activities are relied upon local resources.
2. M. acuminata flour and biscuit production facilities are available around the sale location.
3. The business is generally small-scaled and family business.
4. Using simple technology, and even traditional and labor intensive.
5. The investment and cash flow are relatively small.
6. Labors come from the Community Prosperity Construction members.
7. Their activities have not utilized facilities provided by government yet.
8. Most products and their services are used by low income people and few medium income-society.

Most biscuit business executors in this area can be categorized as small-scaled business with starting capital of IDR 1 million for shop and facility preparations. A small business of biscuit sales usually uses a mean dough of 1 kg M. acuminata flour and one brown sugar to produce 150 biscuits (15 boxes), ten biscuits/box, with a selling price of IDR 10,000/box. Thus, if all boxes are sold out, the trader will get IDR 150,000. The cost needed for biscuit production is IDR 75,000. - so that the profit gained is about 50% (interviews with stakeholder candidate, 2015).

Efforts to increase the turnover of small-scaled entrepreneur are difficult to do, because there are 6 shops of wheat flour-based biscuit in the same area and offer the same product. The biscuits produced by the same producer have no taste variations as well. Other effort to increase the sale turnover is to improve the quality of biscuit material by substituting the wheat flour with M. acuminata flour that is nutritious and rich in antioxidant substances and ameliorating the packing box of the product. Packing box functions not only to maintain the hygiene and the product shape, but can act as promotion event of the product. Therefore, packing box should be attractive, good quality, and informative.

Biscuits entrepreneurs, small or large scale, in Rasi village still pack the product in the boxes commonly sold in the market. The box quality is also poor (thin) and easily damaged in transportation. Also, the box has no information on the trademark lebel, product name, and other information.
Whereas good quality and informative packing box can become promotion to introduce the business and increase the sale turnover.

This problem seems not to be considered yet by the biscuit entrepreneurs in this village due to lack of information on cake processing from *M. acuminata* flour and poor knowledge on good and correct business management including financial management, even though this banana is very abundant in Rasi village. Through training for the biscuit business partners, they will have good skill, capable of creating new products with different tastes, forms, and colors, and can raise the sale turnover.

High number of partners in Rasid village is expected that the partners could develop their business and give their skills to their neighborhoods, and thus, the business could be better in the area. This business development is expected to be able to increase the economy in Rasid village in particular and southeast Minahasa in general.

2. Family Prosperity Construction (FPC) Group of Rasi village

There were 11 FPC groups in Rasid village, Ratahan, and two of these were partners in the Community Partnership Program grant in Rasi village. Selection of these two groups was based on the cake business managed by their members that generally used basic material of wheat flour. One came from subvillage 2 with 20 members led by Ms. Henny and the other from subvillage 3 with 18 members led by Ms. Lee.

Formal education level is important, because education will affect someone’s way of thinking. The higher the educational level is, the higher the ability to accept new innovations than those with low education. Education level also influences people’s participation level in their way of thinking and decision making.

Education level is also one of prosperity indicators, since it functions to increase living status and prosperity (Anonymous, 1995). Members of both partner FPC groups did not have university education, and even some did not get any formal education. There were only 11 members with high school, 9 members with secondary school, and 8 members with elementary school education.

3. Group Problems

Biscuit is a type of food made from flour with addition of other food materials through heating and printing processes. Most biscuits in the markets used flour as raw material. However, common flour has low protein content (Anonymous, 2012). The use of other material flour to make biscuits is not sufficiently developed. Other flour basic materials, such as *M. acuminata*, that are abundant in North Sulawesi are very good to use as basic material of the biscuit because it is gluten free.

The partners in this Community Partnership Program (CPP) were biscuit producers and sellers. Biscuit processing and selling have developed since 1998 and become a business attracting enough number of women in Rasi village, southeast Minahasa. Biscuit sale business can contribute to family income of the executors and fill the women’s spare time to do the business. Hence, women could have their own income that can support their family economy.

Among 12 regencies in North Sulawesi, *M. acuminata* flour-based biscuit processing and sale business were found only in southeast Minahasa, particularly Rasi village. Based on information from Cooperative Services and Small Medium Enterprise (SME), number of shops selling and processing biscuits in this location were 6 units run by rural women (Cooperative Services and SMEs of southeast Minahasa, 2016). This condition shows that this informal sector is capable of developing the traditional/local food image and could also open business opportunity, particularly for rural women. This business development could increase rural economic potentials and give contribution to the family income and regional revenue development.

Other factor affecting this business development is geographic position of Rasi village, Ratahan, that is inter-regency passing route in North Sulawesi or among provinces. This biscuit is one of typical souvenir food for those who pass the area. Therefore, *M. acuminata* flour-based biscuits need to get attention because it could become typical icon of southeast Minahasa and could hoist the traditional/local food image of North Sulawesi in general.
Biscuit processing and sales are mostly run by women’s group as informal sector business, since it has the following characteristics:

1. All activities are relied on local resources. Raw materials, such as *M. acuminata* flour, palm sugar, and facilities, such as print, furnace, and firewood are available around the sales area.
2. Business scale is small and its activities are family’s business.
3. Using simple technology, traditional, and labor-intensive.
4. Relatively small capital.
5. Labors are family members.
6. Their activities have not used assistance/facilities provided by the government.
7. Most of their production and service are revealed by low income people and some medium income communities.

Most biscuit business executors in this area are small-scaled business with initial mean capital of IDR 1,000,000.- for shop building and its facilities. For small-scaled business, biscuit processing used an average of 1 kg *M. acuminata* flour, one palm sugar, 0.03 g baking powder, 0.2 g cinnamon, 0.10 g vanili, 1 g salt, and 50 g butter to produce 150 biscuits (15 boxes), 10 biscuits per box, with profit gain 50% (interviews with partner candidate, 2015).

There were 2-3 bigger entrepreneurs than other business executors. They had higher sales and higher daily turnover even though the biscuits offered had only a single taste (original taste). Mean amount of raw material was 10 L flour and 750 biscuits were produced (75 boxes). Thus, higher net profit could be obtained.

Through this training program, the biscuit business partners could become entrepreneurs who have better skill and be capable of creating new products with different taste, form, and color, and could add the sale turnover.

Involvement of high number of partners in this program, they could develop their business and skill in their surroundings so that the business atmosphere in the area could grow and can increase the economy of Rasi village in particular and southeast Minahasa in general.

Based on the partner situation, problems were formulated as follows:

1. Product produced and offered by all biscuit entrepreneurs in Rasi village was only one taste, no taste, shape, and color variations to make the consumers prefer to buy more products, so that efforts to develop the turnover were inhibited.
2. Biscuit entrepreneurs used packing box without label, such as trade name, owner or location). Product packing seems to be unserious attention and not attractive.
3. Most of biscuit entrepreneurs in Rasi village used wheat flour and had relatively low education. The partners were generally housewives that did not have knowledge on *M. acuminata*-based flour processing, good self-support business and financial management.
4. In response to problems above, a real action is needed on biscuit entrepreneur group empowerment in better business management with more extensive market orientation, that the entrepreneurs could be motivated and work individually or in group. It could be done through knowledge and skill development on *M. acuminata* flour production technique through business management, product variation creation, and product packing box handling. This effort is expected to able to increase sale turnover and add net profit, then eventually raise people prosperity in Rasi village and its surroundings.

### 4. Solution Offered

Challenge to business atmosphere to support empowerment efforts of SMEs development covers wide aspects: 1) human resources development in management, organizational, and technological capability; 2) business competence; 3) wider access to investment and technological and market information, and other production input factors; 4) healthy business climate supporting innovation and business development, international standard business, and healthy competition.

To support the biscuit business in Rasi village, the priority scale implementation of the main aspect is required in this Community Partnership Program. There were 3 main aspects needed to be done: (1)
processing procedure of *M. acuminata*-based flour, (2) product modification and packing box design, and (3) business and financial management. These will be done in group and program realization stays on schedule. The program planned will is given kegiatan in the form of theory and practice in one of the biscuit processing business location agreed in Rasid village.

This training used participative method by involving as many participation as possible of partners in talk and discussion activities and in design and production practices. The program agreed with biscuit entrepreneur partners in Rasi village, southeast Minahasa, was carried out as follows:

1. Training on how to make flour from *M. Acuminata* and to diversify the product taste.
2. Design the cover appearance and packing box production.
3. Training on business management.
4. Training on financial management.

4.1. Activity Implementation and Evaluation:

**Activity Schedule:**

*a). Preparation:*

1. Coordination with related stakeholders, such as government of Rasid village.
2. Choose one person as field coordinator to ease the communication during the program.
3. Socialize the partners that will participate in the program based on the business scale, 1-2 persons from large-scaled biscuit entrepreneurs and 5-8 persons from small-scaled biscuit business.
4. Prepare training modul/materials.

*b). Training:*

1. Mentoring/training on *M. acuminata* flour processing technique and biscuit production with taste modification (different from original taste) made together by the partners and the implementing team. The implementing team of CPP works as instructor in creating new taste together with the partners. Furthermore, products of different tastes were decided together as new product sold in biscuit shops. Training on new taste biscuit processing technique was done several times until 2-3 new tastes were accepted by the partners and CPP team.
2. Mentoring the packing box cover design offered by CPP implementing team to be considered. If the box cover is accepted, the packing box will be produced and used.
3. Training on business management, productio technique, and marketing strategies in the form of practical theory training.
4. Mentoring/ training on financial management in the form of practical theory provided and business cash flow practice.

**Program Evaluation:**

After the training, all series of the activity programs and participants were evaluated. At the end of the training, the participants had to make flour from *M. acuminata* and products with modified taste agreed.

1. The participants are obliged to show an example draft of monthly financial report preparation as obtained in the training.
2. The partners considered to be successful in absorbing and transferring the information and skill through this IbM program were rewarded an oven as product baking equipment.

**Program Activities**

Program activities conducted are presented in Table 2.
Table 1. Program activities

| No | Activity                                           | Participant                    | Instructor                      |
|----|---------------------------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 1  | Training and demonstration on flour processing from *M. acuminata* | FPC group of subvillage 2 and 3 | Community Service Team and Lurah of Rasi, Ratahan |
| 2  | Training and demonstration on *M. acuminata*-based biscuit processing. | FPC group of subvillage 2 and 3 | Community Service Team            |
| 3  | Training on biscuit packing technique              | FPC group of subvillage 2 and 3 | Community Service Team            |
| 4  | Training on financial management                   | FPC group of subvillage 2 and 3 | Community Service Team            |

5. Partner’s Participation Contribution

Phase 1: Providing training and demonstration on *M. acuminata* flour production technique.
FPC Group’s Participation: Each FPC group pays attention and practices the *M. acuminata* flour processing technique.
Phase 2: Training and demonstration on *M. acuminata* flour-based biscuit.
FPC Group’s Participation: Each FPC group processes the cake dough of *M. acuminata* flour and make the print.
Phase 3: Mentoring and Training on financial management.
FPC Group’s Participation: Each FPC group practices the trained processing method.
Phase 4: Gradual monitoring and evaluation on all training activities. This training is aimed at knowing the understanding and implementation level on the training material given and problems found in this training implementation.
Family Prosperity Construction (FPC) Group: Each FPC group reported constraints and problems experienced together with program implementation team and found the solution.

5.1. Output Target
- This Community Partnership Program targets the following outputs:
- All partners of biscuit entrepreneurs (training participants) can make flour from Cavendish banana *M. acuminata* and yield modified products with new taste as trained.
- All partners of biscuit entrepreneurs can use product packing box designed together in this training.
- Most of biscuit entrepreneur partners (60% of training participants are capable of implementing financial management and strategies taught in the training.

5.2. Problem Solution

5.2.1 Training and Demonstration of *M. acuminata* Flour Processing Technique. Based on previous study of Sondakh (1990), cavendish banana *M. Acuminata* contains 80.89 % starch, 2. 89% protein, 0.67% fat, and 2% coarse fiber. It indicates that the potential of *M. Acuminata* development as carbohydrate-sourced food alternative containing 80.89% starch and alternative to process the banana to make flour is one of numerous steps taken to avoid post-harvest loss for the banana farmers. Banana is certainly one of easily decomposed fruit in short time. Besides, the banana production is also high enough and much higher than other fruits, and therefore, it needs to be processed to be flour in order to add the market price.

Nowadays banana flour has been employed to make various processed products, as a substitute of wheat flour, formulation of traditional cake, such as biskuit. Biscuit is a food type made from wheat flour added with other food materials through heating process and printing. Most biscuits sold in the
market use wheat flour of low protein (Anonymous, 2012). The use of non-wheat flour for traditional cake and biscuit processing has recently been developed, especially gluten free biscuit.

In fact, cavendish banana \textit{M. Acuminata} has become people’s need, so that the traditional cake and biscuit development in this program is expected to be able to be an alternative side dish that has higher value using \textit{M. Acuminata} flour as specific local food material in North Sulawesi.

5.2.2 \textit{Cavendish banana} \textit{M. acuminata} \textit{flour processing}. Banana flour processing was done through drying. The banana was thinly chopped and then immersed in warm water. It was intended to control the enzymatic or non-enzymatic browning reaction. Drying was done on the sunlight for 3 days up to have < 10\% water content. It was based on the Indonesian National Standard (SNI) of 01-3841-1995 concerning banana flour that maximum water content of banana flour was 12\%. After the drying, the banana was milled in a blender and sieved through a 80 mesh sieves.

5.2.3 \textit{M. acuminata-based processing technique}. Biscuit is a crunchy snack product made through roasting called dry cookies, it could easily brought anywhere. To enrich the biscuit taste to be more tasteful and diverse, it could be added with chocolate, cheese, fruit, and other spices in order to add different tastes. The raw materials of biscuits preressing still utilize wheat flour but in this occasion the wheat flour was substituted with \textit{M. acuminata} flour. The ingredients needed were 1) 100 g of butter, 2) 200 g of \textit{M. acuminata} flour, 3) 100 g of powder milk, 4) 100 g of palm sugar, 5) 2 eggs, 5) some vanilla, 6) 1/2 dining spoon of cake soda.

Processing technique: 1) Melt butter and palm sugar, then mix with egg that the dough becomes more textured, 2) put all materials and stirred up to having masukkan semua bahan dan aduk sampai adonan menjadi kulis, jika adonan sudah tercampur dengan rata, diamkan adonan dalam suhu ruangan agar mengembang, 3) after several hours, heat in an oven up to 400\textdegree{} F and place the dough in the oven and roasted for 30 min.

6. \textit{Conclusion and Recommendation}

6.1. \textit{Conclusion}

Implementation of Community Partnership Program through training of \textit{M. acuminata} flour production and biscuit processing technique from \textit{M. acuminata} to the FPC group of Rasi village, Ratahan district, southeast Minahasa, could be considered to be successful with the following indicators:

- All activity programs planned, training on flour processing and biscuit processing technique, were well done with full support and participation of FPC members.
- Training on \textit{M. acuminata} flour processing could be done in FPC room of the village office.
- All activity levels of \textit{M. acuminata} flour processing and biscuit production technique training were well done as recommended.
- \textit{M. acuminata} flour and biscuits produced were good enough, delicious, and hoisted by the FPC women and people of North Sulawesi.

6.2. \textit{Recommendation}

Based on the team’s analyses, it is recommended as follows:

- FPC women in Rasi village need to continuously socialize this information in order to alter the thinking patterns of the women concerning \textit{M. acuminata} utilization to yield high market-valued products.
- FPC women in Rasi need to continuously socialize the processing techniques of \textit{M. acuminata} flour production in order to raise the family economy and prosperity.
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