Clove processing as a source of increasing business income in Ambon City

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Abstract. Clove is one of the important plantation commodities in Maluku, especially in Ambon City. Clove processing diversification will provide opportunities to increase business income. This study aims to determine the factors that support the diversification of clove processing on the income of entrepreneurs in the city of Ambon. The method used was purposive sampling. The results showed that the diversification of clove processing gave a large enough contribution to income, but the percentage contribution of processing diversification was not visible because the income outside of processing was relatively large. The results showed that the greater the number of species produced, the greater the capital. Based on the analysis, it is known that the level of raw materials available to entrepreneurs to support diversification activities.

1. Introduction
Clove is a native Indonesian plant originating from the Maluku Islands, Indonesia [1,2] and is one of the most important plantation crop commodities because 99% is cultivated by farmers. According to data [3], Maluku is the largest clove-producing province in Indonesia from 2015 with an average contribution of 15.37%. According to BPS Maluku data [4], the area of clove plantations in Maluku in 2016 was recorded at 43,620.3 ha then increased to 43,780.1 in 2017 with total production increasing from 20,805.6 tons in 2016 to 21,159.6 in 2017. Not as wide as other provinces in Indonesia, but clove productivity in Maluku is higher which affects the amount of production. One of the causes of the high productivity of cloves in Maluku is the high diversity of superior clove germplasm and is supported by the suitability of the agro-climate.

The main product of cloves is flowers, which are widely used as raw materials for the cigarette and spice industry. Another product is in the form of essential oils which can be distilled from flowers, flower stalks, and clove leaves [5–9]. Most of the clove production in Indonesia is used to meet domestic needs as raw material for cigarettes and less than 10% is used for other needs such as cooking spices, medicinal ingredients, food preservatives and others [2,9–17].

Clove product development in the future is directed at diversifying cloves into a variety of products that can provide added value economically. Although clove productivity in Maluku is quite high, its management into a commercial product is still very limited. Clove sales so far have been limited to dry flower buds, while processing in the form of essential oils is also still on a small scale and is still...
traditional [5,6,8,18–24]. The development of clove derivative products into various commercial products is also almost never done so that it has an impact on the welfare of clove farmers in Maluku, especially in Ambon City. The availability of clove raw materials for product diversification will provide opportunities to increase clove farmers’ income in the future [25–31]. Therefore, this research needs to be carried out to evaluate the potential of clove processing diversification as a source of increasing clove business income in the city of Ambon, Maluku, Indonesia.

2. Methods
Diversification research on clove processing was carried out in several clove business units in Ambon City, Maluku, Indonesia. The location was chosen purposively because Ambon City is one of the clove sales centres in Maluku. The types of data used in this study are primary data and secondary data. Primary data was obtained through direct observation, recording, and direct interviews with 25 clove business actors to determine the diversification process of clove products. Secondary data include data on clove production, product prices, costs incurred during the diversification process, the amount of production obtained during the production cycle period and other supporting data. In addition, secondary data were obtained from the Central Statistics Agency (BPS), the Ministry of Agriculture, and relevant literature.

Data collection methods were carried out by means of observation, interviews, and discussions as well as filling out questionnaires to the respondents, namely 25 farmers who are members of the clove business group in Ambon City. The respondent sampling process was carried out by purposive sampling method, with the consideration that the respondents who were used as samples were considered to have the information needed by the researcher.

Data analysis conducted in this study consisted of qualitative analysis and quantitative analysis. Qualitative analysis was carried out through a descriptive approach. Qualitative analysis was conducted to find out the general description of the business unit, production process, and management applied by the business unit. Meanwhile, quantitative analysis was conducted to analyze the production of business unit diversification activities.

3. Results and discussion
3.1. An overview of the clove industry in Ambon City
Maluku Province is the largest clove producer in Indonesia from 2015 with an average contribution of 15.37% (Ditjenbun 2019). Although the area of development in this province is not as wide as in other provinces, it has high productivity which affects the amount of production (Table 1). One of the factors that determine the amount of production is the large number of superior clove varieties in the Maluku Province.

Ambon City as one of the centers of clove production in Maluku, has clove production reaching 404 tons of the total clove production in Maluku. Clove production in Maluku also comes from other regions, namely Eastern Seram Regency (4 763 tons), Central Maluku Regency (9 215 tons), South Buru Regency (2 226 tons), Western Seram Regency (2 879 tons), Buru Regency (412 tons), Southwest Maluku Regency (49 tons), Southeast Maluku Regency (4 tons), and Tual (9 tons).

Table 1. The area and Production of Smallholder Cloves in Maluku by Regencies and Crop Condition in 2018

| No. | Regency/City     | TBM Immature | TM Mature | TTM/TR Damaged | Total | Product (ton) | Productivity (kg/ha) | No of Farmer (KK) |
|-----|------------------|--------------|-----------|----------------|-------|---------------|----------------------|-------------------|
| 1.  | Southeast West Moluccas | -            | -         | -              | -     | -             | -                    | -                 |
| 2.  | Southeast Moluccas     | 7            | 10        | 4              | 20    | 4             | 445                  | 81                |
| 3.  | Centre Moluccas        | 2 837        | 14 550    | 1 360          | 18 746| 9 215         | 633                  | 33 035            |
| 4.  | Buru Island            | 230          | 952       | 45             | 1 226| 412           | 433                  | 6 935             |
| 5.  | Aru Island             | 0            | -         | -              | 0     | -             | -                    | 3                 |
| 6.  | Western Seram          | 1 385        | 5 230     | 501            | 7 116| 2 879         | 551                  | 13 819            |
| 7.  | Eastern Seram          | 1 985        | 6 802     | 1 196          | 9 983| 4 763         | 700                  | 10 275            |
3.2. Product and market diversification
Based on the results of the study, the main product of cloves in Ambon City has so far only been used in the form of selling dry flower buds. Processing in the form of essential oils is still limited and traditional [8,32,33]. Sales in the form of other derivative products are also almost non-existent. Clove flower production purchased from farmers is usually sold immediately after being dried without going through a diversification process to become other derivative products. Clove flowers are usually purchased by large collectors and then sent to large companies in Surabaya via the Yos Sudarso sea port, Ambon.

The selling price of aromatic clove flowers in Ambon City in 2018 was in the range of Rp. 85 000 per kilogram, where from the sale of 1 clove tree, only Rp. 800 000-1 000 000 per tree. If the diversification of the clove flower into essential oil, an even greater profit can be obtained, namely Rp. 1 500 000 – 2 000 000 per tree [6–8]. Profits from the production of other processed cloves are expected to increase again if diversification is carried out into various other commercial products.

3.3. Description of the main actors in the clove value chain in Ambon City
3.3.1. Farmers
Clove farmers in Ambon City carry out activities on cultivated land (on farm), starting from planting, maintaining to harvesting. The average land ownership of farmers is 2-3 hectares. Planting new plants still uses seedlings that grow under the stands and rarely through seedlings first. The maintenance of the garden is only limited to cleaning the nuisance plants that grow in the farmers’ garden area. Garden sanitation is usually carried out simultaneously with the initiation of clove flowers.

Clove harvesting is done by climbing up by the nuclear family (father and son) or hired labor to reap the results. Female family members usually collect the harvest under the tree while helping to separate (remove) the clove flowers from the stems [34–39]. Clove threshing usually continues at night with the help of other relatives. Farmers whose plantations are located far away and need money urgently usually sell their harvested raw cloves directly to collectors in the village who visit the farmers' gardens.

3.3.2. Collectors at village level
Collectors at the village level buy clove flowers from farmers that are still on the tree or that have been knocked down in the form of wet flowers or dried flowers. For the purchase of clove flowers that are still on the tree, traders usually hire workers to do the picking and threshing. The results of the purchase of clove flowers by farmers are then sold to large collectors in the center of Ambon city.

3.3.3. Big traders in the center of Ambon City
Large traders in the center of Ambon City buy cloves which are sold by farmers and by collectors in the village. The collectors bought cloves on a large scale. The results of the cloves are then processed through cleanliness checks, weighing, packaging, storage and shipping through the Yos Sudarso sea port, Ambon to companies that use clove raw materials in Surabaya.

3.3.4. Supporting actor
The success of strengthening the clove commodity value chain in Ambon City is determined by the existence of access to information or knowledge, technology and finance as well as other supporting services. Conditions of supporting actors in the clove value chain in Ambon City are as follows:

➢ Financial Aspect
Farmers do not need large capital for clove cultivation. Farmers’ access to sources of financing in Ambon City is wide open, but the majority of access to banking by farmers is only used for educational and consumptive funding needs.

### Table 3.1: Population of Clove Plantations in the Moluccas (2018)

| No. | Location     | Number of Trees |
|-----|--------------|-----------------|
| 8.  | Southwest Moluccas | 70             |
| 9.  | South Buru   | 1 735           |
| 10. | Ambon city   | 381             |
| 11. | Tual city    | 11              |

Source: Ditjenbun (2019)
➢ Information Aspect
Farmers’ information regarding the selling price of cloves in the market is very limited and not much is known by farmers. Traders so far have more control over clove price information. Market needs (quantity and quality) are also unknown to farmers. This condition causes farmers to have no power over the price of cloves set by collecting traders.

➢ Business development Services
Clove Business Development Service (BDS) in Ambo city so far has not been available and is only carried out by local governments through community economic development programs.

➢ Research Institutions
Research institutions that specialize in handling spices in Ambon City have been established such as the Maluku Spice Council, however, special studies on cloves are still very limited.

3.3.5. Market Chain
The results of the identification of clove farmers in Ambon City, most of them stated that they had no problems in marketing their clove harvest. Farmers’ harvests are usually bought directly in the garden by collectors in the village or sold directly to large collectors at the center in Ambon City. The thing that farmers feel the most in the clove marketing system is that the selling price is completely determined by the collecting traders. Farmers have a very weak position in the clove marketing chain. Price formation rests entirely with middlemen in the village and wholesalers in the center of Ambon City.

The clove commodity marketing chain system in Ambon City has 2 chains. The first chain is from farmers to collectors in the village and then to large traders in the center of Ambon City. The second marketing chain is from farmers to large collectors in the center of Ambon City. From the large collectors in the two chains, the cloves are then sold to companies (manufactures) that use cloves as raw materials located in Surabaya. The two links are presented in Figure 1.

![Figure 1. Clove Market Chain in Ambon City](image)

4. Conclusion
Clove product diversification in business units in Ambon City is still very limited, where clove sales are still limited in the form of dry flower buds. Clove processing into products with economic value has the potential to increase the income of clove business actors in Ambon City.

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