Local community empowerment in developing processing of cinnamon essential oil (*Cinnamomum burmanii*) as a skin care material

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Abstract. This study aims to determine the cooperative relationship of farmer groups who cultivate cinnamon plants and do cinnamon distillation to obtain essential oils with the support of private business communities in the village of Cijalu Curug, Subang, West Java. The data of this study were obtained through surveys and interviews with 30 respondents from farming communities in Curug Cijalu village. To complete the information, it was also observed the process of community empowerment to improve forest ecosystems with productive crops and training in the distillation process with marketing management by the private sector. Data sources use primary and secondary data sources. Data collection techniques include interviews, observation and documentation. The technique of checking the validity of the data uses the source triangulation technique. Data analysis includes the stages of data collection, data reduction, data presentation and conclusion drawing. The data obtained, carried out an analysis to find out the description of the effectiveness of community empowerment and the private sector in order to improve the welfare of farmers and preserve the forest environment to remain sustainable. Cinnamon essential oil containing cinnamaldehyde (60.72%), eugenol (17.62%) and coumarin (13.39%) functions as an antibacterial and can treat skin due to polluted air environment. Cinnamon essential oil can be used as a cream and soap ingredient. Soap and cream products can be used for skin care. Cinnamon trees are widely planted in the Subang area of West Java. The results of the study show that a. through steam distillation, cinnamon essential oil is obtained, b. cinnamon tree waste such as leaves can be processed distillation into essential oils, c. Local people can practice processing essential oils as a result of training, and d. The community can develop the business of processing cinnamon essential oil independently, so that it can be used to add value to family income.

1. Introduction

The application of appropriate technology is very important in supporting efforts to empower the community both in terms of natural resources and human resources. Each region has a lot of natural resource potential but it is very difficult to develop due to a lack of understanding of technology and the high cost of facilities to process these resources. This situation is inseparable from the role of the government and universities in guiding the community to develop the potential possessed by an area [1]. As in the area of Cijalu Curug, Subang, West Java, where development in this region has to date been carried out in principle with the participation and participation of the community through existing
community institutions. The community mostly has gardening or farming livelihoods such as clove and cinnamon gardens.

Indonesia is one of the largest cinnamon producers that supplies most of the world's international markets. Cinnamomum (Cinnamomum burmannii) including Lauraceae family, Cinnamomum clan which consists of hundreds of species in Asia and Australia, one of which is Cinnamomum burmannii, which is widely cultivated in Indonesia [2,3]. Cinnamon is known as one type of spice oldest in the world. Cinnamon bark, branches and branches can be used as spices and are one of Indonesia's export commodities. From the phytochemical aspect of cinnamon has almost all of the parts of the plant containing essential oils with different compositions, the cinnamon leaves also contain essential oils which are potential enough to be utilized [4]. The use of cinnamon leaves is an effort to optimize the benefits of a type of plant. In addition to extracts, cinnamon leaves are also used through leaf distillation to obtain cinnamon leaf essential oil.

To maintain environmental ecosystems such as forests or plantations, there is a need for efforts from the surrounding community [5]. The community can utilize agricultural or plantation products while at the same time preserving forests or gardens by replanting trees around them. From the plantation it can produce fruit, wood and leaves [6].

Cinnamon essential oil containing cinnamaldehyde (60.72%), eugenol (17.62%) and coumarin (13.39%) functions as an antibacterial and can treat skin due to polluted air environment [7]. Cinnamon have been planted by Subang farmers. Cinnamon essential oil can be used as a cream and soap ingredient. Soap and cream products can be used for skin care. Cinnamon trees are widely planted in the Subang area of West Java.

Several factors that need to be considered in the effort to develop essential oil production, especially for export purposes, are products that are guaranteed quality, competitive prices and continuity of production. Other factors that need to be considered in the development of processed products are improving technology, process engineering, analytical techniques, and designing appropriate tools that are strongly supported by applied research and development [7].

There are five types of essential oils which make the biggest contribution to the total value of exports of national essential oils. The contribution of the five types of essential oils reached 70% of the total value of national essential oil exports. The volume and value of exports of Indonesia's five largest essential oils in 2002 can be seen in table 1 below.

| Essential Oil    | 2002       |
|------------------|------------|
|                  | Volume (kg) | Value (US$) |
| Patchouli Oil    | 1,295,378  | 22,526,142  |
| Nutmeg Oil       | 295,089    | 9,273,112   |
| Lamongras Oil    | 106,315    | 775,564     |
| Veiver Oil       | 75,714     | 1,078,451   |
| Cinnamon Oil     | 176        | 3,276,000   |

In the village of Curug Cijalu Subang, West Java, there are cinnamon distillation activities and the planting of cinnamon trees pioneered by the private sector led by youth pioneers who process essential oils through a distillation process. The distillation process is processed through vessel heaters. Cinnamon essential oil obtained as a home industry. This essential oil is not only traded through online but also direct sales. Essential oils can be processed into cosmetic ingredients such as night creams, care creams, and sun protection masks.

For this reason, it is necessary to guide the people in the Cijalu Curug Village, Subang District, West Java, to process cinnamon into essential oils. With the essential oil distillation tool, it is expected that the community can further develop their regional potential which ultimately can increase value in terms of the economy of the community.
The production of essential oils, especially distillation of cinnamon oil in Indonesia, is very large. Likewise, the level of world essential oil needs is promising, so this opportunity must be utilized by the Indonesian people to increase the value of exports, especially the community industry. While many people in the village of Curug Cijalu, Subang Regency also planted a lot of cinnamon trees. The development of cinnamon production in this area is quite high and there is a tendency to increase, but the increase is not accompanied by the welfare of farmers or people who plant cinnamon trees. The community does not yet have the knowledge of diversifying the production of processed cinnamon such as essential oils [8]. Lack of information or knowledge about cinnamon essential oil commodities and marketing aspects is still lacking.

Opportunities in the volatile oil industry were captured by the pioneer of the essential oil Mr. Fery which started from the home industry by doing simple distillation of surrounding plant leaves such as clove leaves and lemongrass leaves. Gradually the business grew and established a business entity CV. Pavettia, in Curug Cijalu Subang District West Java village. To develop its business, Fery approached the community to also produce essential oils. The trick is to conduct training in planting cinnamon trees so they can produce good cinnamon and fulfill production requirements. Harvested timber is then sold to CV. Paverti for processing into essential oils. But the perceived income for the cinnamon tree farmer’s community is not large, so the community must be able to produce it themselves. Then local people are also trained to produce their own, namely simple distillation in their homes [7].

The benefits of cinnamon oil are needed by humans among food, health and beauty. In the field of beauty cinnamon oil can be used to reduce skin moisture, manufacture natural soaps, make creams and beauty masks, reduce acne, reduce black spots on the face and form skin smoothness [9]. While environmental factors such as air pollutants and ultra violet sun play a role in reducing the health of exposed skin. It is known that the skin is a very large part of the organ in protecting the organs inside it. [10].

The purpose of this study: (1) Determine an efficient cinnamon oil distillation method for the superior cinnamon oil product industry and choose a potential location for the industry in Subang Regency, West Java; (2) Analyzing the feasibility and business potential of developing the cinnamon oil processing industry in Subang Regency, and (3) Formulating a strategy for developing the cinnamon oil processing industry in Subang Regency.

2. Method

This study uses the case method on CV. Pavettia in the village of Curug Cijalu, Subang Regency, West Java. The determination of this research due to the consideration of this location is the location of the small industry of cinnamon essential oil which was developed by CV. Pavettia, and because in Subang district there are villages that plant cinnamon trees. The cultivation of cinnamon oil carried out by refiners in this area is based on CV training. Pavettia and its marketing system are still running traditionally as usual. But then by CV. Pavettia is collaborating for out-of-district sales to other cities in Indonesia.

The population of this study will be taken from a number of people from the farming community and informants Mr. Fery, founder and initiator of refining cinnamon essential oil. Farmers who will be used as respondents and are informants who are expected to be able to provide data and information directly [11]. The research was conducted by surveying the training sites of the Subang community and CV. Pavettia, Cijalu Curug Subang District East Java, in developing plantations of cinnamon trees and processing them by steam distillation, so that essential oils were obtained. Samples were taken purposively as many as 30 people.

The data collection technique used was through in-depth interviews conducted through a number of meetings with farmer groups and Mr. Fery, whose process was in question and answer regarding various aspects of the research. To complete the data, an observation was also made to the location of the cinnamon essential oil refining industry. In the course of observing many of the phenomena observed and immediately asked the informant [11]. The average education of respondents is graduating junior high school (60%) and high school (40%).
3. Result and discussion

The results of the study show that (a) through steam distillation, cinnamon essential oil is obtained, (b) cinnamon leaves can be processed distillation into essential oils. That is the small industry is giving training to Subang community how to distillate Cinnamon to get the essential oil and how to sell it. (c) Local people can practice processing essential oils as a result of training, and d. By t-test The community (80%) can develop the business of processing cinnamon essential oils independently, to increase their income.

The results of the tests carried out on the use of a direct steam distiller that has undergone improvement, it is known that the total production of nutmeg oil with a 24-hour distillation time yields a yield of 8.5% v / b (volume / weight). Laboratory testing shows that the remaining oil in refined pulp is 0.8%, b / v [5]. The results show that for 24 hours’ distillation almost all of the oil in nutmeg has been distilled (91.4%) so that technically the performance of refined distillers with direct steam method is sufficient. If the traditional distillation is over 30 hours long, this method uses 22 hours of refining time. The level of myristisin in 24-hour distillation oil is quite high (9.37%). According to Trease and Evans Cinnamon extract (*Cinnamomum burmannii*) has antibacterial activity in the form of the ability to inhibit *E. faecalis* growth with the highest number of colonies found at a concentration of 1.5% ie 299.3 x 10^4 CFU / ml and the least number of colonies found in concentration 7.5%, which is 6 x 10^4 CFU / ml [2]. The Minimum Inhibition Level (MIC) of this study for the growth of *E. faecalis* was at a concentration of 1.5% and was not found Minimum Kill Rate (KBM).

| Parameter     | Composition |
|---------------|-------------|
| Water content | 7.9 %       |
| Essential Oil | 2.4 %       |
| Extract Alcohol | 10-12 %   |
| dust          | 3.55 %      |
| crude fiber   | 20,30 %     |
| Carbohydrat   | 59,55 %     |
| Fat           | 2,20 %      |

Cinnamon if processed into essential oil so that there is a need to update information on science and technology by holding counseling and training on the use of essential oil distillation devices [10]. The level of community participation in cinnamon farmers is quite high (80%) during training. Every information given by the instructor is not clear, the participants ask again. Training lasts 5 working days. The first and second days were filled with general knowledge about planting and maintaining cinnamon trees. Then on the rest of the training day with the material on the practice of directly refining cinnamon oil.

The results of the practice are then applied in their homes for farmers who already have cinnamon plants that can be harvested. The distillation is cinnamon essential oil. Every month farmers can collect around Rp. 3 million.
The materials used in essential oil distillation devices are as follows: Aluminum: Used as an ingredient in making steaming stoves, it is intended that the heat produced by coal / fuelwood be easily absorbed and can speed up the process. Plate Iron: The manufacture of iron fireplace stoves is intended so that the construction of the burner can last long and can withstand the load generated by the steaming furnace. Glass fiber: To accommodate the water used as an oil cooler after going through the evaporation process. Stainless Steel: Used as a connecting device between steaming stoves and cooling devices that are useful so that the steam produced by the steaming furnace does not evaporate.

The objectives of the diversion training activities to the community are: Increased empowerment of community resources in Cijalu Curug Subang, West Java with the application of essential oil distillation tools. Open new business opportunities in the field of processing essential oils specifically cinnamon oil. The expected benefits of this activity are: Developing the ability of the community to process cinnamon plants into essential oils into products that have higher economic value. Improve the economy of the people of Cijalu Curug Subang Regency, West Java. Realizing aspects of equity in development.

In carrying out public awareness through counseling on the importance of environmental protection and entrepreneurship, the process of knowledge transformation is carried out through several environmentally friendly entrepreneurship skills training, and in the mentoring process to improve community independence. The success of farmers can be seen from the realization of a green environment in Curug Cijalu Village, an added economic added value for the community through entrepreneurship in the promotion of cinnamon into essential oils and strengthening community solidarity. The obstacle agreed upon by the farmers is the division of time and shortcomings of members of the work team. Efforts made to overcome these challenges are to manage the schedule of activities properly, set priorities, use personal agreements and the private sector to help market essential oils and develop cinnamon essential oil products into cosmetic products.

Essential oils are usually obtained by distillation of steam in parts of plants that contain oil. This distillation method depends on the conditions of the plant material. Steam distillation requires water, hot steam which is usually pressurized more than 1 atmosphere is flowed through a steam pipe. The equipment used is no different from distilling water and steam, only an additional tool is needed to check the temperature and pressure. If the inspection has been carried out with water and steam, only an additional tool is needed to check the temperature and pressure. If the inspection has been done well, in this way more oil will be obtained. This method can also be used to make essential oils from seeds, roots, wood, which generally contain high boiling point oil components. This distillation can be used to make clove oil, cinnamon oil, vetiver oil, citronella oil, eucalyptus oil, and others.

The advantages of this method are: the quality of the oil produced is quite good, the pressure and temperature can be regulated, the time of distillation is short, hydrolysis does not occur. The disadvantages of this method are: equipment that is expensive and requires experts.

How the cinnamon oil maker works: Material (Patchouli or volatile leaves and water) is put together into a tank steamer. Then the tank is closed and the furnace is turned on, after that it is waited until...
evaporation occurs. The steam that comes out by itself will flowing into the cooling bath, after passing through the steam bath, it will go to the oil and water reservoir to be deposited and the filtration process carried out. distillation results are a mixture of essential oils, water, and solvents. the compounds that come out of the destilator are ingredients or compounds that have a low boiling point, then essential oils. to get clean essential oil, filtering is done. the results of this filter are stored in vessels.

**Table 3.** Determination of the cinnamon oil distillation method by respondents.

| No. | Criteria                                      | Weight | Alternative Value |
|-----|-----------------------------------------------|--------|-------------------|
|     |                                               |        | a*    | b   | C   |
| 1   | Convenien                                     | 5      | 4.00  | 3.50| 4.00|
| 2   | According to available finds                  | 5      | 3.50  | 4.00| 4.00|
| 3   | According to the Level of Community Accept    | 4      | 3.50  | 4.00| 3.50|
| 4   | According to the Level of on Community Knowledge | 4      | 2.50  | 4.50| 4.50|
| 5   | Minimum Land Requirements                     | 3      | 3.50  | 4.00| 3.50|
| 6   | Minimum Pollution                             | 3      | 3.00  | 3.00| 3.00|
|     | **Total**                                     |        | 1.808 | 2.306| 2.678|
|     | **Ranking**                                   |        | 3     | 2   | 1   |

The data above shows that the majority of respondents chose steam distillation. This is because steam distillation techniques are more efficient both in the procurement of equipment and distillation times. Steam technique for distillation also causes reduced air pollution from cooking results you are sweet. The product acceptability is also more practical so it does not require a wider distillation space. With only 3 x 4 m² space, respondents can develop essential oil distillation production.

The approach to empowering peasant communities is one way in independent communities. Empowerment means to generate resources, opportunities, knowledge, and skills to increase the capacity of the community to determine and develop themselves economically [13]. The process of community empowerment means the ability of a person to understand and control the social and economic conditions and environment of cinnamon tree plantations which are very necessary for the welfare of society [14].

In the community awareness stage, it is conducted through counseling about the importance of preserving the environment through planting cinnamon and entrepreneurship, in the stage of knowledge transformation carried out through several environmentally friendly entrepreneurship skills training, and in the mentoring stage to improve community independence. The success of farmer groups can be seen from the realization of green conditions in the Curug Cijalu Village environment, the existence of economic added value for the any community and the strengthening of community solidarity. The obstacle faced by farmer groups is the division of time and the capacity of members of the work team. Efforts made to overcome these obstacles are to properly organize activity schedules, set priorities, use a personal persuasive approach.

Environmental-based peasant community empowerment program and maintaining cinnamon forest ecosystem in Curug Cijalu Village, West Java Subang began to show positive results. This can be seen from the emergence of the business of home-based industrial farming communities as a result of the development of cinnamon essential oil. Farmer groups that have been given knowledge and training utilize factor cinnamon waste to be distilled and produce essential oils. Empowerment of farmer groups working with the private sector to carry out development programs, namely (1) training and distillation
of cinnamon, (2) marketing potential for distillation, (3) entrepreneurship of cinnamon distillation products, and plantation potential to protect forest ecosystems.

Human social capital is a very important thing in utilizing natural resources and community resources. Community social capital is characterized by a high level of education so that it can provide motivation and can develop empowerment and have a significant impact on community independence. [15,16]. The existence of the community with the Environment is a unified whole. The community with its activities becomes a phenomenon that provides a dominant and beneficial color for the environment, needs and its own human ecosystem, so that cooperation between the environment and the community can continue [17]. Humans, their culture and environment participate in participating in the Environment including farmers and cinnamon planters who participate in preserving the environment.

4. Conclusion
The Relationship pattern is a plasma (farmer society) core partnership can be implementation. The statistical test t-test shows partnership between small industry and farmer groups is extremely effective in improving the Cinnamon distilling farmers group income and community empowerment can be developed. To determine cinnamon oil which is efficient (good) in producing raw materials for the industry of superior products processed from cinnamon oil. The selected distillation method is the direct steam method, while the selected superior product is cosmetic ingredients and the selected industrial location is the District of Cijalu Curug, Subang District, West Java. The strategy and prospects for the development of the cinnamon oil processed product industry make it possible to develop, especially for community empowerment in Subang Regency by paying attention to market feasibility analysis with market opportunity criteria (consumer needs for cosmetic products and competition) analysis of technological aspects with management and work criteria the same between the farming community and the company.

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