Development of herbal teabag products based on regional potency to improve forest communities’ welfare

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Abstract. On May 10, 2019, the Directorate General of Sustainable Production Forest Management with online shopping @shopee_id began collaboration to promote and market Non-Timber Forest Products in order to improve Indonesian economic. The potential of non-timber forest products in East Kalimantan, Indonesia is abundant, especially the utilization as medicinal plants based on local wisdom, such as in Merabu village, Berau district, and Dilang Puti village, West Kutai district, East Kalimantan. Traditional medicinal products tend to be less regulated and have no selling value. This study aims to develop herbal teabag products, beginning from production process, the cost of production, brand naming, and to strengthening an organization for manage or manufacture herbal teabags from these two villages. Merabu has high potential of gaharu (Aquilaria malaccensis), karamunting (Melastoma malabatricum), and ironwood (Eusideroxylon zwageri). The product made is prima tea, with main ingredients of mixed leaves of A. malaccensis, R. tomentosa and a little amount of E. zwageri powder as a dye. Meanwhile, Dilang Puti has high potential of laban (Vitex pubescens), and ginger (Zingiber officinale). Thus, a tea product namely Pusaka tea is introduced, with the main ingredients of mixed inner bark of V. pubescens and Z. officinale powder. All processing implements a cooperative model to produce herbal teabags, with raw materials taken from members' garden. The product manufacturing training process tends to be faster and easier, while naming is quite long due to a common name should be recognized by all parties, beginning from young people, general public, and customary elders. Furthermore, herbal tea bag products are packaged and sold through established organizations, which then have a positive impact on local communities’ income.

1. Introduction
Kalimantan has high biodiversity [1]. One of them is biodiversity related to traditional medicinal plant species. Various species of medicinal plants have been used for generations until the present day [2]. Current research has proven that various species of traditional medicinal plants are useful for human health [3]. These medicinal plants provide major source of molecules with medicinal properties due to the presence of natural compounds. In these natural compounds, amounts of antioxidant substances are of particular interest. The antioxidant substances of medicinal plants can act as key-feature of modern multi-potent remedies, and it may help to protect the cells against the oxidative damage caused by free-radicals. The oxidative stress that leads to progression of disorders such as: cardiovascular diseases, degenerative conditions, rheumatic disorders, metabolic syndrome, and premature aging can be reduced [4]. However, the development of the importance of traditional medicinal that may become benefit products and offering healthy phytochemical recipes for rural communities need to be performed.
One form of products based on traditional medicinal plants that is easy to make is herbal tea as a form of forest product diversification. Product diversification needs to be done to increase beverage products [5]. Teabags are products that are easy to make even in a household scale. Teabags change to the shape of brewed drinks that must be made at least 1 liter to 1 cup (200 ml) for 1 person, when need more to drink, just make it more. According to the Minister of Health regulatory HK.01.07/MENKES/187/2017, the formulary concerning of traditional Indonesian medicinal ingredients, teabags are a development of the brewed form. Meanwhile, teabag is one of product alternative that is easy to send to other places and durable. This such diversification products processing will be considered more practice, convenience, low production costs, with maximum profits and benefits. Strategy of product diversification is also very important to increase non-timber forest product [6]. Product diversification is expected to accelerate selling derivative products in the market [7]. Products diversification require social entrepreneurship, and increase the number of individuals who need to work by gathering occupations that guarantee sustainability and increase the income of herbal product makers [8]. Besides, the brand naming process is one of the most critical parts of product building strategy. It’s necessary to create brand name for basic core differentiator of a good product. A great name makes an impression without revealing what went into its creation. A successful brand naming process must confirm the following five criteria i.e., be unique to the company and/or product; convey clear benefits to critical audiences; be motivational to employees and stakeholders; be sustainable over time; and be extendible to all aspects of company communications [9]. Further, organizational strengthening measures to manage or produce a product are also very necessary. An organization must regulate its structure and management to strengthen the goals of this organization. Therefore, manufacturing strategy are its dominant orientation (market or product), pattern of diversification (product, market, or process), attitude toward growth (acceptance of low growth rate), and choice between competitive strategies (high profit margins versus high output volumes) [10].

In East Kalimantan, there are 2 villages that have potential medicinal plants that can be developed into herbal tea products such as Dilang Puti Village, Bentian Besar Regency and Merabu Village, Kelay District, Berau District. In both villages, organizational formation in the form of business groups have been formed, i.e., Kelompok Tani Datai Lino in Dilang Puti Village and BUMDes Kerima Puri in Merabu Village. In Datai Lino, farmer group that has been formed, there are already business units in the form of fish farming, youth sports, but they do not yet have a business unit that utilizes the potential of the plants around them. While at BMDes Kerima Puri, there are already recreational activities (ecotourism), for example recreation to Nyadeng lake, and caves with ancient palm sites. For this reason, the idea of making product diversification such as tea bag from local plants is expected to be a complement to existing business units, in the form of “welcome drinks and souvenirs”. These tea products are then named according to local potential, traditional knowledge and descriptions of each area. Herbal tea product industry must be based on local potency, main components and knowledge [11]. Thus, based on the local potency, wisdom, and knowledge of Bentian Besar and Kelay, this present study aims to produce herbal teabag products, beginning from production process, cost of production, brand naming until product design, and strengthening an organization to manage or manufacture herbal teabags from these two villages.

2. Material and methods
The research is conducted in Merabu Village, Kelay District, Berau District, and Dilang Puti Village, Bentian Besar District, West Kutai Regency, East Kalimantan, Indonesia. In each village, the researcher provides assistance to make herbal teabag and conduct an economic analysis of tea bags products. The assistance include theory and practices, making product prototypes until the final products, and making packaging designs. The respondent/target group who is being trained for Pusaka tea is representatives of farmer group (Kelompok Tani) Datai Lino, Dilang Puti Village, Bentian Besar District, West Kutai Regency, while the pRima tea was representatives of Village-Owned Enterprise (BUMDes) Kerima Puri, Merabu Village, Kelay District, Berau District. Data analysis is performed descriptively.
3. Results and discussions

3.1. Production process and cost

Herbal tea product industry must be based on local potency and knowledge [12]. Dilang puti village has the potential for Laban trees (Vitex vestita) that grow naturally and many residents plant ginger. Pusaka tea uses the inner bark of the Laban tree which has traditionally been used as a substitute for tea. While ginger is used to enhance the taste of Pusaka tea. Laban (Vitex pinnata) can be used to cure wounds, stomach aches and as coloring agent [13]. Ginger contained active compounds that enhanced flavor and aroma, such as zingiberol, limonene, etc. [14].

In Merabu village, many karamunting (Melastoma malabatricum) grow naturally, and many people plant agarwood (Aquilaria malacensis) trees. The pRima tea was used Karamunting leaves and agarwood leaves as raw materials. As a color enhancer for pRima tea is used ironwood sawdust, manually. According to local knowledge, Ironwood (Eusideroxylon zwageri) powder has been used traditionally as a colorant for tea substitutes. Karamunting leaves have some biological activity, such as anti-inflammation, anti-pyretic [15], anti-nociceptive [16], and traditionally used as tonsillitis medication [17]. Agarwood leaves traditionally used as anti-inflammation [18], and it can be used as tea product or beverages [19]. All herbal teabags processing process are used a cooperative model with raw materials that are taken from members’ garden.

During preparation process and production, all of raw materials are air dried, chopped/crashed, mashed/grinded, filtered, weighted, and then prepared for teabag. The composition and ingredient of tea bags are determined based on ethnobotanical knowledge and the potential of plants in these local villages, while various equipments are used for these products mostly home equipment as usual.

![Production process of herbal teabag](image)

**Figure 1.** Production process of herbal teabag.

The economic analysis includes the assessment of costs, benefits, and cost-effectiveness of the action, as well as assessments of costs, benefits and cost-effectiveness of these teabag products is presented in the following Table 1.

| Estimated materials requirements | Pusaka Tea each box @ 10 tea bag (IDR) | pRima Tea each box @ 10 tea bag (IDR) |
|----------------------------------|---------------------------------------|---------------------------------------|
| *Aquilaria malacensis*           | 200                                   |                                       |
| *Melastoma malabatricum*        | 200                                   |                                       |
| *Eusideroxylon zwageri*          | 100                                   |                                       |
| *Vitex pubescens*               | 300                                   |                                       |
| Product          | Quantity   | Price  |
|------------------|------------|--------|
| Zingiber officinale | 100        | 4,100  |
| Product packaging |            | 4,100  |
| Others: labours, depreciation tools, production energy | 1,900  | 1,900  |
| Total cost       | 6,400      | 6,500  |
| Estimated selling price | 25,000  | 25,000  |
| Profit           | 18,600     | 18,500 |
| Total products yielded | 20 boxes @ 10 teabags | 20 boxes @ 10 teabags |
| Estimated total profit | 372,000  | 370,000 |

A recent study indicates that development of these tea products is provided 2-3 times profit of total production cost can be predicted and significantly improves the local community’s income.

3.2. Production name selection/product brand naming
A brand’s name is an essential part of the package due to its integral part of creating the brand’s reputation, development, and future success. A brand name also reflects the overall product image, positioning, and, ideally, its benefits [20, 21]. Herbal tea product produced in the village of Dilang Puti is named Pusaka Tea, while in Merabu Village the name is Prima Tea. The process of determining the name of herbal tea products based on deliberation. The challenge of these products brand name determined is to found a name that is short but reflects the advantages of product made. Determining the name of Pusaka tea in Dilang Puti village was taken about 2 weeks that time. The traditional elders are formulated the name of Pusaka tea and the other residents just followed. While in determining the name of Prima tea in Merabu village, it took only 1 day that time. The youth group is provided a name that reflects health, while the elder group provides a name that reflects traditional culture. Finally, they agreed that the name Prima reflects both wishes, youth and elders of Merabu village. The voice of traditional elders determines village policy [22].

Figure 2. Kelompok Tani Datai Lino.  
Figure 3. BUMDes Kerima Puri.
Product name determines the selling power of the product to consumers [23]. “Pusaka” names has a philosophy as an ancestral heritage object that has charisma, it can be used from the past to the present day. While “pRima” has 2 meanings, i.e., Rima in local language means forest, while prima in Indonesian means very good health. Based on two meanings, pRima means material from the forest that is useful for maintaining health. Both herbal teabags have interesting names, and they describe a unique characteristic of each region.

Pusaka tea has a dominant yellow base color on the packaging box. The yellow color in perspective shows a concern and security [24]. Pusaka tea packaging shows that safety/health is very important to be notified. Besides, pRima tea has a packaging background of Nyadeng lake view and a little view of the ancient “hands stamps”. The both sites are tourist attractions in Merabu village.

3.3. Organization formation

Pusaka tea home industry is managed by the farmer group (Kelompok Tani) Datai Lino, while pRima tea is managed by the Village-Owned Enterprise (BUMDes) Kerima Puri. The establishment of the herbal tea business managed by the village-scale business unit has several advantages. Home industry is better managed by a village-scale joint business unit [25]. Village-scale joint business units can regulate the availability of raw materials [26]. Business group units can regulate the suitability of product selling prices [27].

Efforts in strengthening an organization to manage or manufacture herbal teabags from these two villages including theory and practices until funding are conducted by involvement of all parties according to their capacity and their potential resources. In the implementation, such activities are involved following i.e., PT UDIT provides the gathering of participants, farmer groups provide snacks & consumption, while, Centre for Dipterocarps Forest Ecosystem Research and Development provides training materials and assistance.

The development of Pusaka tea and pRima tea products can be more successful with the help of local facilitators from NGOs and timber companies located near the activity sites. Pusaka tea product development in the village of Dilang Puti received assistance from the Yasiwa NGO (Yayasan Katulistiwa) and PRIMA tea product in Merabu village receives assistance from the Village Development Division of PT UDIT (Utama Damai Indah Timber). NGOs and companies around the village often interact with residents so that they can provide more intensive assistance [28].
4. Conclusions
Product diversification of non-timber forest products as traditional medicine based on local wisdom are introduced as herbal teabag products, namely Pusaka tea and pRima tea. Traditional medicine is still recognized as the preferred primary health care system in rural and also urban communities due to a number of reasons including affordability, accessibility and low cost. The present study provides some herbal teabag products which make convenient, inexpensive, and contemporary considerations, without any reduce of its efficacies.

Recent study is indicated that these products provide economic benefit which can improve the local community’s income. The development of these products is conducted with the help of local facilitators from NGOs and timber companies located near the activity sites. It means, these products need to be more intensively assisted, and encouraged with entrepreneurial spirit of the farmer groups, especially women involvement. The development of product diversification is expected to have competitiveness in marketing, and it will support community’s economy. This study also provides an innovation of herbal medicine that would be predicted to attract consumers to the market to promote general positive image consumers for having more healthy beverages, and creating herbal medicine not bitter as it is usually.

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