The magic of local plants for the community prosperity and the economics of Argosuko village

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Abstract. Village areas that classified as the poor or undeveloped places usually characterized by the majority of the population as farmers. The large population of farmers makes them have many of the plant commodities that can be used as medicinal plants or others such as drying to be simplicia. Simplicia is a dry form of the plant parts such as from seed, branch, leaf, root, flower or the fruit. Therefore, this research purposed to know the diversity of local plants that have a potency to be an additional income for local people of Argosuko Village, Poncokusumo District, Malang and also to improve and educate the local people on how to process the plant to be a simplicia. The result showed that there are 30 species of plants that have the high potency to be converted into simplicia. Besides the plant species survey, We also give knowledge about simplicia on how to process, how to package the products, and also how to make a license their products from simplicia. The high opportunity of Argosuko Village to improve their prosperity and economy are widely open, supported by the availability of materials (local plants) and the willingness of Argosuko people to trade its products. For further study we arrange to analyze the local plants ingredients in Argosuko Village to strengthen product licensing.

1. Introduction
Community prosperity is an important thing that must be continuously improved. The development of social prosperity is regulated in Law No. 11/2009 (UU Nomor 11 Tahun 2009) to create a decent and dignified life, and to fulfill the rights to the basic needs of citizens for the achievement of prosperity. Community prosperity can be improved through community empowerment in managing natural resources or local potential [1,2]. One area that has good local resources and has high potential, but the local resources are unwell utilized by the local communities is found at the Poncokusumo District, Malang Regency. Geographically, Poncokusumo District is highly-supportive to grow and plant various types of plants including medicinal plants. This area is located in the Bromo Tengger Semeru National Park (TNBTS) area, approximately 2500 m to 2700 m above the sea level, with temperatures ranging from 3°C to 20°C.

Previous studies indicated that local plants in TNBTS are have not been used by local people as potential biological resources for medicine. Poncokusumo District has huge potential medicinal plants, from the Herba group 72 divisions consisting of 53 families and 51 orders, from the Lignosus group of 55 divisions consisting of 32 families and 32 orders [3]. Indications and unconsciousness of local people about the utilization of the richness of their local resources are shown by the neglect of...
some potential medicinal and abundant plants. In the Ngadas Village, at Poncokusumo District are found and widely-planted of many Welsh Onion (*Allium fistulosum*) [3]. The low quality of *Allium fistulosum* was unused and thrown away, indicates an ineffective use. Sulasmii et al. (2016) represent similar results that Indonesian Bay-leaf (*Sizygium polyanthum*) are abundant in the Wangkalkidul Village, Poncokusumo District, and also not yet utilized [4].

A paradigm about *Return to Nature* has confirmed that medicinal ingredients from nature are better used than synthetic drugs [5-7] because synthetic drugs contain a variety of secondary metabolites [8-10]. The existence of abundant medicinal plants if managed and used properly will undoubtedly improve the community's economy. Various parts of the plant can be used as a provider of raw materials for medicines/simplicia that have high economic value to be sold [4]. Simplicia is one of the plants which are used as a medicine that never experiences any treatment but drying. Simplicia obtained from home-yard and fields, planted or non-planted. The chemicals in simplicia contain volatile oil, starch and some active substances (tannins, alkaloid, saponins, terpenoids, etc.) [11]. To make good simplicia is started from wet sorting, washing, drying, chopping, and dry sorting [4].

The quality of simplicia are depended on the water content, the lower the water content in plant organs, the better the quality of simplicia. Thus, our research has the aim to obtain the complete data on local plant diversity and the used in the local community for simplicia, which is the sustainability of our previous research at the Poncokusumo District in a different Village. This research was conducted in the Argosuko Village, Poncokusumo District, Malang Regency.

2. Methods
The research was conducted at Argosuko Village, Poncokusumo District, Malang Regency, East Java Province, Indonesia. We performed an interview, questionnaires, a forum group discussion, and also a practical work to make the simplicia products from the local plants of Argosuko Village. Those steps were implemented into 40 housewives in the Argosuko Village. The results and outcomes (knowledge and skills) of activities are analyzed in descriptive qualitative [12].

After the simplicia was processed, the next step is to package and to make the license for commercialization. The Medical Materials Agency and the Industrial Service from Malang (Dinas Material Medika & Dinas Perindustrian) as partners can help to facilitate the community to process and manage various plants part to be a medicine and also to help with the marketing strategies.

3. Results and Discussion
Based on the interview, questionnaires, and forum group discussions, we have identified 30 local plants that the well-distributed and could be the potential plant as a medicinal plant (Table 1). Those 30 species of local plants can be converted into simplicia.

Our questionnaires contained pre-test and post-test. The pre-test was performed to know the local people’s awareness and knowledge about local plant utilization by convert into simplicia. Based on the pre-test we can conclude the local people of Village Argosuko have a low cognition of the utilization of local plants as medicine by processing into a simplicia. 80% (from 40 housewives) of local people are do not know about simplicia and how to make a simplica. 20% of them have the experience to make a simplicia and how to process it, however, these people are not disseminating to others.

The post-test consisting some questions about the step on how to make a dry simplicia, a question about the local plant that well-spread on Argosuko Village, and also the kinds of using the simplicia for medicinal or for the food additional ingredients. The post-test could tell us that 90% of the local people of Argosuko Village are well-known about simplicia and the drying process. Moreover, they were have been given the knowledge to package and how to make licenses to commercialize their products.
Table 1. List of local plants in Argosuko Village that can use to be transformed into simplicia

| No. | Local name     | Scientific name (parts of the plant)          |
|-----|----------------|---------------------------------------------|
| 1   | Gingseng jawa  | *Talinum paniculatum*                      |
| 2   | Kunyit         | *Curcuma longa*                             |
| 3   | Kunyit putih   | *Curcuma zedoaria*                         |
| 4   | Temulawak      | *Curcuma zanthorrhiza*                      |
| 5   | Loas           | *Alpinia galanga*                          |
| 6   | Jahe           | *Zingiber officinale*                       |
| 7   | Lengkuas       | *Alpinia galanga*                          |
| 8   | Biji pepaya    | *Carica papaya (seed)*                     |
| 9   | Daun sirsak    | *Annona muricata (leaf)*                   |
| 10  | Tanduk rusa    | *Platycerium bifurcatum*                   |
| 11  | Binahong       | *Anredera cordifolia*                      |
| 12  | Karet kebo     | *Ficus elastica*                           |
| 13  | Kitolod        | *Hippobroma longiflora*                    |
| 14  | Mengkudu       | *Morinda citrifolia*                       |
| 15  | Daun bawang pre| *Allium fistulosum*                        |
| 16  | Andong merah   | *Cordyline Fruticosa*                      |
| 17  | Bandotan       | *Ageratum conyzoides*                      |
| 18  | Bunga kamboja  | *Plumeria sp. (flower)*                    |
| 19  | Bunga kenanga  | *Cananga odorata (flower)*                 |
| 20  | Bunga alamanda | *Allamanda cathartica (flower)*            |
| 21  | Bunga soka     | *Saraca asoca (flower)*                    |
| 22  | Bunga kertas   | *Bougainvillea glabra (flower)*            |
| 23  | Tapak liman    | *Elephantopus scaber*                      |
| 24  | Dandang Gendhis| *Clinacanthus nutans*                      |
| 25  | Bunga bakung   | *Lilium sp. (flower)*                      |
| 26  | Daun beluntas  | *Pluchea indica (leaf)*                    |
| 27  | Puring         | *Codiaeum variegatum*                      |
| 28  | Keladi tikus   | *Typhonium flagelliforme*                  |
| 29  | Biji alpukat   | *Persea americana (seed)*                  |
| 30  | Salam          | *Sizygium polyanthum (leaf and seed)*      |

Based on the forum group discussion we could recognize that Argosuko’s local people are less-skilled to utilize the local plants. The results of Forum Group Discussion explained that Argosuko’s local people are 1) have not utilized all available crop potential in environment as economic source, 2) not yet know how to make dry simplicia, 3) does not care about the existence of local potential plant for medicine, 4) knowledge of beverage/food production has not cared to hygiene requirements, 5) has not demonstrated creativity and innovation in making artwork products made from local potential, and 6) have not utilized local potential crops as cultivation products.

The drying technique can be done naturally and artificially. Drying naturally can be done with direct sunlight and with the wind. While artificially dry can be done by using an oven or blower [4]. Sulasmi et al. (2016) showed that a long time of drying will produce the lower water content on the plant organ [4]. Furthermore, the combination of drying methods by natural and artificial will effectively dry the plants better than the only natural/artificial work.
Figure 1. Simplicia products* from *Saraca asoca* (flower), *Persea americana* (seed) and *Carica papaya* (seed). *Figure’s information showed the products from left to right

Figure 1 showed three packaged simplicia in the bottle and ready to be stored. The packaging have purposes such preserve the product fresh, prevent the contamination, and persuade the consumers [13]. To select a good package for preserving food quality, generally, the producers will look for materials that are cheap, easy to obtain and have significant functions. The main function of a good package is to maintain the migration of remaining water, oxygen, and aroma that can decrease the food product and flavor [14]. To preserve the quality of simplicia, we might put some silica gel to keep the products dry. De Vere et al. (2015) showed that silica gel is used as an absorbent, drying agent, and support catalyst. Silica gel prevents the formation of excess moisture, then we might store the products in several years [15].

Figure 2. The most commonly used plants to make the simplicia in Argosuko Village

We invited the Medical Materials Agency and the Industrial Service of Malang Regency, to broaden Argosuko’s people insight on product branding. to increase the tradability, we need to know how to make a product packaging design and to enhance competitiveness. Department of Industry and Commerce of Malang Regency explained, to gain the maximum effects of product branding we must consider several factors such as packaging, label, brand, tagline, and weight. According to Sammut & Bonnici (2015), branding is a long-term strategy that composed of strategies and activities from product innovation to marketing communications. The good branding strategies were started from; 1.
product design and product line innovation, 2. Pricing strategy, 3. Distribution strategy, 4. Marketing communications, and 5. Competitive brand position [16].

To make a simplicia, an important requirement is the availability of raw materials. In the Argosuko Village has been identified 30 local plants can be used to process and modified into valuable items. The most commonly used plant to be simplicia was *Syzygium polyanthum* or Indonesian Bay-Leaf (the local name is *Salam*). After *S. polyanthum*, there is *Typhonium flagelliforme* 12% (Rodent tuber) and followed by *Alpinia galanga* 10% (Blue ginger), *Curcuma zanthorrhiza* 10% (Javanese ginger) and so on. These common used plants to be simplicia, were almost in line with the needs of medicinal plants consumption in Indonesia (Table 2), which means there is a high opportunity to enter the market.

Based on the used percentage (Figure 2), it was indicated that *S. polyanthum* is widely distributed and easily found in Argosuko Village. *S. polyanthum* is used for food seasoning because of its rich aroma it was known has a wide range of bioactivity such as antihypertensive, antimicrobial, and anti-diarrheal [17,18]. *T. Flagelliforme* has been known to inhibit cancer growth [19], besides that *Alpinia galanga* have some uses to treat rheumatism, prevent inflammation, reduce dizzy seasickness, treat diarrhea, treat gastric sores, treat skin diseases. Furthermore, *C. zanthorrhiza* are known to have several functions such as antioxidant, antidote, prevent cancer cells, treat skin diseases (acne), anti-inflammatory, anti-cholesterol, increase appetite [20].

**Table 2.** Development of Medicinal Plants and Product Exports in Indonesia (2011-2015) [21]

| Plants                          | Export value (in millions of USD) |
|---------------------------------|-----------------------------------|
|                                 | 2011  | 2012  | 2013  | 2014  | 2015  |
| Ginger, Curcuma, Saffron, Bay-leaf, Curry spices | 2146.91 | 1662.36 | 1955.92 | 2205.92 | 2049.28 |

The uptake of medicinal plants comes from various uses, such as (1) raw materials for the traditional medicine industry, (2) food, beverage, pharmaceutical and cosmetics industries, (3) ingredients for household spices, and (4) exports [22]. The high consumption of traditional medicines domestically and abroad can have a big impact on small and medium industries of traditional medicines from local plants. Ginger, turmeric, Bay-leaf, curry spices, and other spices dominate the trade with import value reaching USD 2.1 billion in 2015 [23]. It was known that the top four plants in Argosuko Village are used as simplicia were *Syzygium polyanthum* (Indonesian Bay-Leaf), *Typhonium flagelliforme* (Rodent tuber), *Alpinia galanga* (Blue ginger), and *Curcuma zanthorrhiza* (Javanese ginger). At the domestic market, the *T. flagelliforme* in the form of simplicia, can sell up to Rp 100.000/ons, in other words, it can be sold around Rp 1.000.000/kg. In other plants such as *S. polyanthum, A. galanga* (Blue ginger), and *C. zanthorrhiza,* can sell up to Rp 100.000/kg. Salim & Munadi (2017) showed that the most dominant domestic consumers of medicinal plants are the pharmaceutical industry (63%), 23% of household consumers, and 14% for exports. Based on that fact, the high use of simplicia for medical purposes domestically and abroad (out of the country), can provide a high and promising market share for the Argosuko people to increase the prosperity and economics.

4. Conclusion

We conclude that 30 identified local plants can be found in Argosuko Village, Poncokusumo District, Malang Regency. There are four local plants, commonly used to convert into Simplicia: *Syzygium polyanthum, Typhonium flagelliforme, Alpinia galanga,* and *Curcuma zanthorrhiza.* The high chance and opportunity of Simplicia trading could be a magical thing to improve Argosuko’s people prosperities. For further study, We need to identify the chemical ingredients of the local plants that mostly used by Argosuko’s people to know the specific compound of the local plants. Thus, the local people can release the products with specific, accurate and reliable compositions.

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