

# Potential Development Essential Oil Production of Central Java, Indonesia

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**Abstract.** Indonesia is the source of raw essential oil in the world. Essential oils are used in various types of industries such as food and beverage, flavour, fragrance, perfumery, pharmaceuticals, and cosmetics. However, the development of Indonesian essential oil industry has not been encouraging for the production of essential oils, further it is unable to meet global demand. Besides that, the quality of volatile oil resulted cannot meet the international market standards. Based on the facts, the potential of Indonesian essential oils needs to be developed to provide added value, through increased production, improved quality and product diversification. One part of Indonesia having abundant of raw essential oil source is Central Java. Central Java has the quite large potential production of essential oils. Some essential oils produced from refining industry owned by the government, private and community sectors include cananga oils (Boyolali district), clove oils (Semarang district), patchouli oils (Brebes district, Pemalang district, and Klaten district). The main problem in the development of plants industries that producing essential oil in Central Java is low crops production, farming properties, quality of essential oils are diverse, providing poor-quality products and volatile oil price fluctuations. Marketing constraints of Central Java essential oils are quite complex supply chain. In general, marketing constraints of essential oils due to three factors, namely the low quality due to type of essential oil business that generally shaped small businesses with different capital and technology, domestic marketing is still a buyer-market (price determined by the buyer) because of weak bargaining position processors businessman, and prices fluctuate (domestic and foreign) due to uncontrolled domestic production and inter-country competition among manufacturers.

## 1. Introduction

Indonesia is a tropical country, so many types of plants that grow. According to [1,3] that not less than 17% of plant species are in Indonesia. Some parts of plant essential oil can be taken, both from leaves, roots, flowers, fruits, and even the trunk [7]. The development of Indonesian essential oil industry is very slow. The types of essential oils exported since colonial times are lemongrass, cananga [8], patchouli and fragrant roots. Until 1970, the type of essential oil that is exported is still limited that commodity. Since 1975, exported kinds of essential oils began to grow with clove oil, sandalwood oil, ginger, pepper and nutmeg, then massoia oil of Irian Jaya in the 1990s [5]. In 1993, the types of essential oils that exported amounted to 15 species [2,3].



The development of Indonesian essential oil industry has not been encouraging. According to the Chairman of Dewan Atsiri Indonesia [1], the primary production of Indonesian essential oils is clove oil (clove leaf oil and clove stem oil) [4], citronella oil, patchouli oil, cajuput oil, and turpentine oil. The world trade value essential oils is estimated USD 4 billion, total exports of Indonesian essential oil is USD 120 million [6]. The review of its kind there is 300 kinds of essential oils in world trade, while the kinds of essential oils that are likely to be developed in Indonesia are 40 types.

**Table 1.** The needs of world essential oils and Indonesian essential oil production [1]

Essential Oil	Global demand (Tonnes)	Indonesian Production (Tonnes)
Clove oil	5.000-6.000	3.500-4.000
Patchouli oil	1.200-1.500	800-1.000
Citronella oil	>2.000	500-600
Turpentine oil	>10.000	10.000
Cajuput oil	>1.000	350-400
Nutmeg oil	>400	350-400

Director General of IKM Data from 2003-2008 shows the export value of Indonesian essential oil is lower than the value essential oil derivatives products import. As an illustration of essential oil export and import imbalance at the end 2007 that value of essential oil exports rise to \$ 101 million, while the value of essential oil derivatives imports is USD 389 million. That trend continues to this day. Large population and the ability of better economic to the market destination of various commodities. The concern if the commodities are essential oils [1].

## 2. Methods

Samples of essential oil industries are five districts based on the largest production activity of essential oils data that is used as a source of information. Data to be collected includes: (1) Type of essential oil produced, (2) The capacity and quality of production is already underway, (3) Technology processing/refining use, (4) The availability of raw materials and production support (5) Barriers and opportunities, and (6) Management and Marketing

## 3. Result and Discussion

### Identify the Strengths, Weaknesses, Opportunities and Threats

In Boyolali distric, Central Java is a small industry producing cananga oil. The industry has a lower strength development than the weakness. The major constraint weakness on the Boyolali distric, Central Java is limited raw materials in the company resulting flowers supply from farmers who are also limited. Besides, cananga flower is seasonal nature also farmers prefer to sell cananga flowers as sow flowers because the price is higher than in the company.

Five factors of both the opportunities and threats can be described based on observations in Boyolali, distric, Boyolali. The most influential of the possibilities factor in that company is a high demand in the international market. This indicates that in the absence of the company's competitors which can develop production to meet worldwide demand. The company can increase profits from the optimal production. The threat is a lack of relationships with raw materials suppliers that would have an impact on the continuity of business because the raw materials are limited. Its continuity of production is hampered.

**Table 2.** Identification of Strengths and Weaknesses at Cananga Oil Development in Small Industries in Boyolali Distric

Internal Factors	Strengths	Weaknesses
Financial condition	-	Capitalization is still lacking
Human Resources	Long time experience	Low human resources quality
Production	Low business risk SNI standard (Indonesian standard) quality Accommodate cananga flower farmers	Limited raw materials owned companies Management of technology tools are still lacking Lesa waste management
Marketing	-	Marketing is through exporters

(Primary Data, 2016)

**Table 3.** Identification of opportunities and threats at cananga oil development in small industries, Boyolali distric, Central Java

Internal Factors	Opportunities	Threats
Competitor	Lack of competition	-
Customer	High demand in the international market	Demands demand of high-quality essential oils
Suppliers	-	the lack relationships with raw materials suppliers
Natural conditions	-	Cananga flower land diminishing
Government policy	Government's attention to the distiller	Caterpillar pests in the rainy season
Economic conditions	-	Volatile oil prices fluctuating
Socio-cultural	Environmental conditions are safe	-
Technology aspect	Advanced technology	-

(Primary Data, 2016)

**General Analysis of Essential Oil Potential in Central Java**

The main problem in the development of plants industry producing essential oil in Central Java, among others: (1) lower production plants, (2) The type of farming, (3) different essential oils quality, (4) Providing lesser products quality, (5) volatile oil prices fluctuation. Problems in Central Java on marketing did not become a significant constraint as a result of any number essential oils are always some accept. Enterprises essential oil industry in Central Java mostly cultivated by farmers or craftsman in the countryside as small industries. A Large industry exists only in Purwokerto, namely PT. Indesso Aroma and PT. Takasago. Then, the secondary industry such as PT. Java Plant, PT. Natura Aromatik Nusanputera in Surakarta. Farm management is a sideline with a small capital and technology potluck. Not all technology package (kind of superior varieties, cultivation and processing / post-harvest) are available for some aromatic plants commodities because many types and research priorities are still small compared with other plantation crops. Small-scale farming, production and low essential oils quality. This is due to limit technological capability that does not meet the technical requirements, the use of not superior varieties, equipment and less qualified processing methods.

### General Analysis of Essential Oil Production in Central Java

Most of the oil refining industry is still continuing production in Central Java because of factors that support the business, such as location which adjacent to raw materials source, close to water sources, and easy access to obtain fuel.

The main production facilities are iron plate kettle, furnace, condenser, and receiver or essential oil container. Other necessary equipment such as 200 litres of a plastic drum to contain essential oils, rakes, spoons, chamber, oil funnel and filter cloth. Most of the essential oil refiners in Central Java has been used fairly standard distillation with stainless steel 304 equipment. However, they also found smaller-refiners still use goods used for the refining process.

The primary raw material used in essential oil Central Java, most of the leaves such as clove oil, patchouli oil, piper betle oil. Then from the leaves and stalks of local lemongrass oil and aromatic lemongrass oil. A small portion of the interest such as cananga flower oil and oil from rhizomes like ginger and turmeric. In general, the production process can be done 5-6 months in a year.

The human resources required in the manufacturing process is relatively not too much. Power to manufacturing process requires only 3 per distillation process. If the first day of the entrepreneur did two times distillation process then required six temporary workers per day per kettle (assuming the entrepreneur has two kettles).

The technology used in the production of essential oil processing in Central Java, including simple or traditional technology. The process commonly used is distillation with water vapour.

### Competition Analysis and Market Opportunities

The level of competition Indonesian essential oil in the international market is mainly determined by essential oil quality produced by Indonesia and competitor countries, such as Madagascar, Tanzania and Sri Lanka. The state is producing essential oil not only from developing countries, such as China, Brazil, Indonesia, India, Argentina and Mexico, but also developed countries like the United States, France, Germany, Italy, and England. The difference is developing countries produce more semi-finished essential oils then export them to developed countries. Another case in developed countries, although they import semi-finished materials from developing countries to be processed into finished goods, they export it back to other nations, including developing countries to be finished products with higher added value. Nevertheless, clove oil market opportunity is still wide open, especially on the world market which increasing demand volume.

### General Marketing Path Analysis

Essential oil marketing channels are no different from other agricultural commodities. In domestic marketing, producers sell their products to intermediaries or exporters agents. It was only then that product into the hands of an exporter. Most trading of essential oil for export.

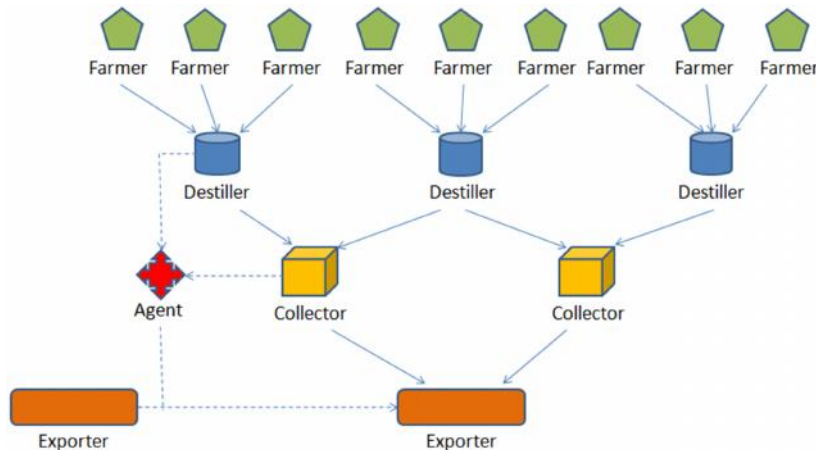


Figure 1. Flow detail volatile oil marketing in Central Java

The primary constraint marketing of this essential oil is trading supply chain quite complicated. The volatile oil processing business is still experiencing difficulties to supply directly to the exporter or the end-user. As a result of this complex trade, the chain is specified quality uniformity. Factors to be considered in essential oils marketing efforts, mainly for export purposes is attention quality, competitive pricing and production sustainability. In general, marketing constraints essential oils due to three factors, namely: (1) a low quality because of the type of essential oil producers that is generally small businesses with different capital and technology, (2) Domestic marketing is still a buyers market (price determined by the buyer) because of weak bargaining position processing entrepreneurs, and (3) Prices are fluctuating (domestic and foreign) due to uncontrolled production of domestic and inter-country competition among manufacturers.

#### 4. Conclusion

This study has shown one part of Indonesia which are abundant of raw essential oil source is Central Java. Central Java has the potential production of essential oils are quite large. Some essential oils produced from refining industry owned by the government, private and community sectors include cananga oils (Boyolali district), clove oils (Semarang district), patchouli oils (Brebes district, Pemalang district, and Klaten district). The main problem in the development of plants industries that producing essential oil in Central Java is low crops production, farming properties, quality of essential oils are diverse, providing poor-quality products and volatile oil price fluctuations. Besides, marketing constraints of essential oils due to three factors, namely the low quality due to type of essential oil business that generally shaped small businesses with different capital and technology, domestic marketing is still a buyers market (price determined by the buyer) because of weak bargaining position processors businessman, and prices fluctuate (domestic and foreign) due to uncontrolled domestic production and inter-country competition among manufacturers.

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