

THE INDUSTRIALIZATION OF MEDICINAL PLANTS IN INDONESIA

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Submission date: 23-Jun-2023 10:06AM (UTC+0700)

Submission ID: 2121195690

File name: Siregar22410.pdf (354.06K)

Word count: 6189

Character count: 35262

THE INDUSTRIALIZATION OF MEDICINAL PLANTS IN INDONESIA

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ABSTRACT

¹¹ This article reviews the use of medicinal plants in Indonesia, the development of the medicinal plant industry, and its role in the process of industrializing medicinal plants. The review was carried out using the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) method by including the criteria for original articles and reports. Searches were done on Google Scholar, Proquest, Pubmed, Science Direct, and Springer websites. The key words employed for the search included economic development, industrialization, leading sectors, medicinal plants, and modernization. The inclusion and exclusion criteria was based on duplication, redundancy, method and quality of the article. In the search results of the selected article database, 71 out of 300 articles and reports were included in the criteria. According to the findings of this systematic review, the industrialization of medicinal plants represents an opportunity to alter regional and national economic structures. Industrialization of medicinal plants is a process of modernizing medicinal plant commodities which aims to increase the added value of all economic sectors with the manufacturing sector which are interrelated. The industrialization of medicinal plants is marked by the development and improvement of superior medicinal plant commodities as the leading sector of the regional and national economy. Industrialization of superior medicinal plant commodities can change the economic structure by increasing the contribution of the industrial sector to consumer demand, increasing Gross Domestic Product (GDP), increasing export value and availability of employment opportunities as well as increasing long-term economic development and increasing income per capita, to ensure equal distribution of welfare for farmers and the community. Industrialization of medicinal plants can increase the added value of medicinal plant commodities, increase consumer demand, increase the value of GDP, increase the value of exports and employment, increase the potential for domestic and foreign demand, encourage the development of the domestic and foreign industrial sectors, expand employment opportunities, reduce dependence on imports, and increase the country's foreign exchange. Economic development oriented toward the medicinal plant industry is the right industrialization strategy for Indonesia.

Key words: Economic Development, Industrialization, Leading Sectors, Medicinal Plants, Modernization



<https://doi.org/10.18697/ajfand.120.22410>

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INTRODUCTION

The production of pharmaceuticals has undergone advancements over the past two centuries. This ranges from raw herbal and botanical preparations to the development of complex manufacturing of modern medicinal products in dosage forms [1]. Manufacturing procedures for production preparation begin with small-scale manufacturing processes using basic tools and progress to large-scale production as part of the pharmaceutical industry, which has a high economic value. These processes go hand-in-hand with the need for and development of drug preparations [2]. The process of developing and improving the quality of the use of herbal ingredients as part of the pharmacology industry has occurred in various parts of the world. China is the largest country that implements the practice of Ayurveda medicine. It was reported that China has developed distribution and planning patterns in the traditional medicinal plant industry, strengthened the development of medicinal plants in various regions, and built a center for processing medicinal plant materials. It has established high-quality medicinal plant nurseries, and integrated treatment methods of traditional medicine with western medicine in medical health science. Furthermore, China has developed chromatography technology for quality control of metabolites of medicinal plant materials [3]. It was also reported that Malaysia, through the Malaysian Herbal Monographs (MHM) committee, is trying to develop herbal monographs by increasing the herbal market [4]. The European Union was also reported to have increased regulations on the use of standardized herbal medicinal production licenses within a specific regulatory framework for herbal products [7]. Also, progress in the herbal products industry in South Africa has been made by adopting various technological approaches [5]. Even in the United States, industry 4.0 has begun to be developed for pharmaceutical manufacturing in preparation for future production sites [1].

Indonesia is a country that utilizes medicinal plants as ingredients and its use has increased in recent years. An increase in the use of traditional household health services was reported from 2013–2018, from 30.1%-44.2% [6]. This increase in demand for traditional medicines is in line with the growth of industries that provide added value to the value of medicinal plant commodities in Indonesia. These include the Pharmaceutical Industry (PI), the Traditional Medicine Industry (TMI), and the Traditional Medicine Small Business (TMSB). These industries have started to spread in all provinces in Indonesia. In the development of the industrial revolution, the production sector and the manufacturing industry (pharmaceutical manufacturing industry, technology development manufacturing industry, innovation, production specialization, and trade between countries) played a very



important role in increasing production output and improving the national economy [7]. Based on the report of the Indonesian Central Statistics Agency (CSA) [8], the increase in the national economy from the traditional medicine industry sector and the growth of the manufacturing industry (pharmaceuticals, pharmacology, and traditional medicine) were able to increase the growth in the value of the national gross domestic product (GDP) and economic growth by 7.85% and 3%, respectively. The traditional medicine industry also experienced an increase in growth going from 4.46% in 2018 to 9.03% in 2019 and again increasing to 9.39% (YoY) in 2020. The growth of this industrial group is the highest among industries [9].

The growth of the traditional medicine industry in Indonesia is also accompanied by the growth of the pharmaceutical manufacturing industry. In the 2015–2019 period, the number of pharmaceutical industries increased from 198 to 230 industries. As for the primary sector, there was an increase from 8 to 14 industries in the same year and this industry was dominated by domestic private companies [8]. The trend of the total market share of the pharmaceutical sector in Indonesia is also reported to increase from Rp 65.9 trillion (US\$ 43.99 billion) to Rp 88.36 trillion (US\$ 58.98 billion) in the period 2016-2019 [9]. This shows that there has been an increase in the demand for and consumption of medicines. This was due to the increasing awareness of the Indonesian people about the importance of health and the need for medicines [10].

Although the agricultural industry has been able to increase the value of GDP and economic growth, this has not been in line with efforts to distribute public welfare. The Ministry of National Development Planning of Indonesia reports that the level of welfare of farmers in the horticulture sub-sector is not evenly distributed [8]. This can be seen from the regional farmers' exchange rates (FER) in some areas, which are still below one hundred (<100). In addition, the development of the medicinal plant industry in Indonesia also tends to be slower than in other countries [22]. Indonesia is reportedly still having problems in supplying quality raw materials to be able to compete in the international domestic market. Also, Indonesia was reported to be facing challenges in overcoming weaknesses in infrastructure, operations, and manufacturing regulations [8]. Industrialization must be able to bring higher output potential, increase manufacturing safety, improve quality value, use technological innovation, provide additional flexibility, and create economic value for the country [9]. However, with the growth and development of medicinal plants and the pharmaceutical industry, it is expected to be able to support efforts to distribute welfare by increasing the value of regional FER. This article was



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aimed at examining the use of medicinal plants in Indonesia, including industrial development and its role in the process of industrializing medicinal plants.

MATERIALS AND METHODS

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Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) was the method used in the review. The review was carried out by first identifying articles in various sources of scientific reports: Pubmed, Scopus, Science Direct, and Elsevier, using the keywords "medicinal plants" combined with "industrialization, leading sectors, modernization, and economic development." The time period was set at the identification stage, which was 2013-2021. The second step was article selection. The selection was made by comparing the relevance of the title of the article with the sub-topic of the research discussion. The third step was validation. This was achieved by reviewing the depth and quality of the content of the article and its relevance to the sub-topic of the research discussion. Of the 300 articles and reports that were selected, 71 articles and 7 reports that met the criteria were selected. The fourth step is the article review (Figure 1).



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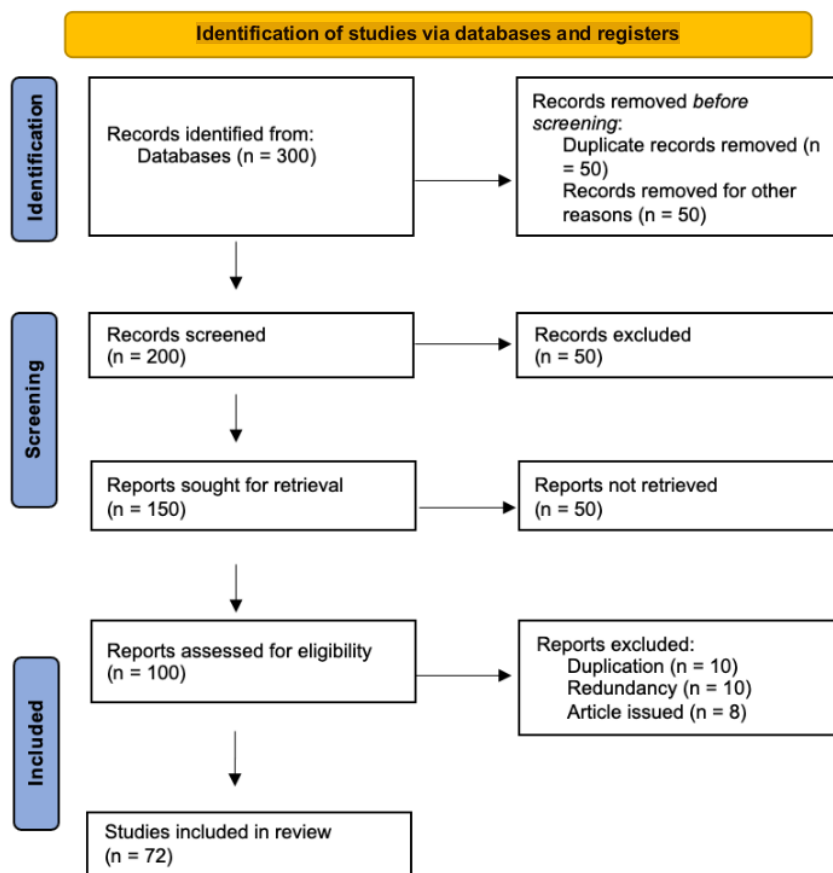


Figure 1: The author's steps in selecting supporting references for compiling an article review

RESULTS AND DISCUSSION

6 Medicinal plants

According to the World Health Organization (WHO), medicinal plants are any plant that, in one or more of its organs, contains substances that can be used for therapeutic purposes or are precursors for the synthesis of useful drugs [11]. Medicinal plants are plants that include: (a) plants or plant parts used as medicine in galenic preparations (including decoction and infusion), (b) plants used for the extraction of pure substances either for direct medicinal use or for the semi-synthesis of compound drugs, (c) food plants, spices, and fragrances used as medicine, (d) microscopic plants used for the isolation of drugs, especially



antibiotics, and (e) plant fibers used for the preparation of surgical materials [12]. According to the Ministry of Health of Indonesia No. 149 of 1978, medicinal plants are (a) plants or parts of plants used as ingredients for traditional medicine or herbal medicine, (b) plants or plant parts used as starting ingredients for medicinal raw materials and (c) plants or plant parts extracted and the plant extracts used as medicine [13].

The Indonesia Ministry of Health regulates the utilization of medicinal plants by urging the public to use medicinal plants as traditional medicines to maintain health and prevent diseases [16]. The government also established a National Health System (NHS) through the Decree of the Minister of Health of the Republic of Indonesia No. 374/Menkes/SK/V/2009, which regulates the development and improvement of medicinal plants as traditional medicines. This was intended to obtain traditional medicines that are of high quality, safe, have tangible properties that are scientifically tested, and are widely used, both for self-medication by the community as well as in formal health services [15]. The decree of the Minister of Agriculture of Indonesia No. 141/Kpts/HK.150/M/2/2019 established 65 types of medicinal plant commodities, including 14 types of rhizome plants and 51 types of non-rhizome plants. There are currently only 15 medicinal plants recorded in the CSA Horticultural Statistics. These include *Zingiber officinale*, *Acorus calamus*, *Alpinia galanga*, *Ammomum cardamomum*, *Kaempferia galanga*, *Morinda citrifolia*, *Curcuma longa*, *Phaleria macrocarpa*, *Zingiber zerumbet*, *Strobilcumathes crispis, paniculata*, *Curcuma aeruginosa*, *Aloe vera*, and *Boesenbergia rotunda* [16]. Of these medicinal plants, the rhizomes that are mostly produced in Indonesia are *Zingiber officinale*, *Alpinia galanga*, *Kaempferia galanga*, and *Curcuma longa*. *Zingiber officinale* and *Curcuma species* have the most widespread use in the traditional and herbal medicine industries [17].

Medicinal plants have functions and efficacy as immunomodulators, anti-inflammatory, and antiviral agents. They have been used for the healing and prevention of various diseases as well as contain active substances that can treat certain types of diseases. Also, they contain a resultant/synergistic effect of various substances that have a healing effect [8]. The use of medicinal plants is generally intended for treatment and health [29] because medicinal plants have a lot of potential to be used as raw materials for modern herbal-based medicines [18].

The National Medicine Plants Board predicts that the opportunity for world demand/ consumption of medicinal plants will continue to increase [19]. The investment growth factor and the world's medicinal plant user industry, as evidenced by the increased distribution of pharmaceutical, cosmetic, processed



food and beverage products, and bio-pesticides, will drive up global demand for medicinal plants. According to Siregar *et al.* [20], traditional medicine is becoming more and more expensive and unaffordable. The trend of healthy lifestyles is increasingly popular, causing people in developing countries to be more inclined to switch to herbal medicine.

¹⁶ In addition to being used as the main medicinal ingredient, medicinal plants are also widely consumed in the form of supplements [33]. The supplement industry on the global market is expected to continue to grow significantly. According to Nutraceuticals World, transactions in the supplements and remedies market reached USD 107 billion in 2017, with Europe having the highest demand [21]. Several factors contribute to the increase in demand for supplements, including the need for supplements as functional foods, public trust in consuming herbal medicines as a preventive measure, and the release of current good manufacturing practices (CGMP) standards for supplement products. Apart from being used as medicinal ingredients and supplements, medicinal plants are also used in the food industry. These include complementary ingredients in cooking and as the main flavour in several food products, such as bread, cakes, biscuits, and alcoholic beverages [22].

According to reports, medicinal plants have been utilized all over the world, specifically in developed and developing nations. Up to this point, about 80% of the population in developing countries has used medicines made from medicinal plants for their health needs [23]. Ullah *et al.* [24] reported that Saudi Arabia utilizes 96 species of medicinal plants from 47 families for pharmacological needs. China and India trade 7,000 species and 700,000 tonnes of medicinal plants annually, and Morocco is reported to export 58.7 tonnes of medicinal plants annually. In addition, Sofowory *et al.* [12] claimed that the annual global commerce in herbal medicines exceeds USD100 billion, with trade in medicinal plants accounting for around USD2-5 billion in India and China. Over USD1 billion was estimated in Germany. It was also reported that in the last 5 years, sales of medicinal plants have doubled in China, tripled in India, and grown by 25% in continental Europe [25]. Brazil, through its regulations, is also reported to have developed phytotherapy through two important policies, namely the National Policy on Medicinal Plants and Herbal Medicines and the National Policy on Integrative and Complementary Practices [26].

³⁷ Alternative medicine such as Traditional Chinese Medicine (TCM), Indian Ayurveda, and Unani Arabic medicines are starting to be widely used in developed countries, and their credibility is starting to increase in various countries around the



world. The WHO estimates that the demand for medicinal plants will increase to USD 5 trillion by 2050 [27]. Indonesia, as a developing country that has the largest diversity of medicinal plant species in the world, must be able to improve the quality of medicinal plant commodities and products to be able to meet both local and foreign demands [15]. Improving the quality of medicinal plants can be done by increasing the added value of medicinal plant commodities. The increase in added value in medicinal plant commodities has the potential to support increased welfare, especially for medicinal plant farmers [28].

Astutik *et al.* [29] reported that there are several obstacles in the production system of medicinal plants in Indonesia. These obstacles are reported to have occurred due to several dynamics, including a shift in the way of providing commodities, and the potential of medicinal plants as ingredients for traditional and modern medicine. Furthermore, support for livelihoods, multi-scale institutional knowledge (formal and informal) that is still fragmented, and a lack of studies on strategies to commercialize medicinal plants, boom-bust cycles, and law enforcement have also been cited. In addition, Salim and Munadi [8] opined that Indonesia has low seed availability and quality. Sources of natural medicinal ingredients in Indonesia are mostly the result of the direct exploitation of wild plants, forests, and yards that have not been cultivated in a planned and integrated manner. Due to farmers' and collectors' inability and lack of knowledge in properly processing and managing medicinal plants, the quality of Indonesian medicinal plants is also considered low. To balance the potential for regional and international needs, it is necessary to increase the added value of medicinal plant commodities. Changes in the economic system and structure of medicinal plant commodities are required to transition from an agricultural to an industrial basis [29].

Medicinal Plant Industry

According to Law No. 5/1984, the medicinal plant industry is an economic activity that processes raw materials, semi-finished goods, and/or finished goods into goods with a higher value for their use [7]. The industry is an activity that converts basic goods mechanically, chemically, or conventionally into semi-finished goods or finished goods [8]. The agricultural industry (agro-industry) is an industry that uses agricultural products as its main raw material or an industry that produces a product that is used as a means or input in agriculture. This includes industries that produce agricultural equipment and machinery, agricultural input industries, and service industries in the agricultural sector, and the agricultural product processing industry [30]. One of them is the raw material for medicinal plants or the medicinal plant industry.



In the agro-industrial sector, especially the medicinal plant industry, farmers' prosperity, and commodity development can be realized through industrial development, both in the primary sector (providers of raw materials) and the secondary sector (manufacturing industry) [7]. The Central Bureau of Statistics of the Republic of Indonesia reported that in the last five years, the manufacturing and agricultural sectors were the sectors that had the largest share of GDP with a fluctuating value (Table 1) [31]. The relationship between the agricultural and industrial sectors is indicated by the number of industries operating in the agro-industrial sub-sector. Based on CSA data [31], it is known that in 2020, the non-oil and gas industry had the largest contribution to GDP, which was 52.94%. From this value, the primary and secondary sectors were able to absorb up to 29.76% of workers (Table 2).

Based on the contribution of the non-oil and gas industry, 7.28% was reported to be contributed by the chemical, pharmaceutical and traditional medicine industries. The three industries are industries that rely on the agricultural sector, especially medicinal plants, as their raw materials. It was also reported that, from the contributions of the agricultural and manufacturing sectors, 0.10% of the labour absorption was by the medicinal plant industry. These data indicate that the agricultural sector and the industrial sector, especially medicinal plants, have a major role in Indonesia's economic development [31].

The medicinal plant industry is a sector that has the potential to generate added value, especially with the shift in the structure of the economy from agriculture-based to industrial-based [8]. The role of the medicinal plant industry and agriculture-based development can encourage economic growth and improve the welfare of the community (especially horticultural farmers) in the form of equitable distribution of community income and encourage development welfare [7]. The added value of a commodity is obtained from the variety of medicinal plant products produced, the availability and use of modern technology, and capital to generate maximum profit. The progress of the medicinal plant industry sector is one of the triggers for economic stability to spur regional economic growth, create jobs, and support the people's economy [32].

The development of the medicinal plant industry can be seen in the use and provision of commodities with added value. In Indonesia, the use of medicinal plants is not only carried out by individuals but also by the PI, the TMI, and the STMB [7]. Although the existence of the medicinal plant industry in Indonesia is reported to be uneven, it can be seen that the island of Java is the island with the largest number of medicinal plant industries in Indonesia (Table 1).



² Based on the types of products that can be produced, the medicinal plant industry consists of 5 types, namely TMI, Natural Ingredients Extract Industry (NIEI), STMB, Traditional Medicine Micro Business (TMMB), and Herbal Medicine Business [8]. The traditional medicine industry is capable of producing all types of traditional medicine dosage forms. There are 227 PIs, 135 TMIs, and 1,710 STMBs and TMMBs that have been established³² and are operating in Indonesia. All of them are managed by the private sector [7]. The Food and Drug Supervisory Agency [FDSA] of Indonesia stipulated that all products of the traditional medicine industry circulating in Indonesia are reported to have had a distribution permit/registration with the FDSA [33]. More than 10,000 medicinal plant products (herbs) are registered with the FDSA, including 32 standard herbal medicinal products and 5 phytopharmaceutical products.

To support the development of the medicinal plant industry³⁶, the government has issued Policy No. 31/MENKES/SK/III/2007 concerning the use of medicinal plants as traditional medicines. The policy is contained in the National Traditional Medicine Policy (KOSTRANAS) [34]. However, this policy has not been implemented in a way that promotes the growth of medicinal plants. Traditional medicine policies have not been implemented by conceptualized programs and clear budget allocations, both for the health sector and other sectors, according to Siahaan and Aryastami [35]. They also claimed that there has been a lack of clear and integrated coordination between related sectors regarding programs for the development of medicinal plants.

Salim and Munadi [8], also reported that Indonesia does not yet have a maximum primary sector. Additionally, the market has not been adequately absorbed, technology utilization has not been maximized, and a lack of guidance and training for farmers. There has been a lack of market absorption, a lack of scientific research in product and market development efforts, and little funding for agribusiness development [8]. The development of the medicinal plant industry sector in economic development is reported to have not been able to accelerate economic growth and people's incomes, especially farmers of medicinal plant commodities [7]. The industrial sector is the leading sector in economic development, so there is a need for industrialization in the use of medicinal plants.

Medicinal Plant Industrialization

The medicinal plant industry is an important component of the economy. The industry provides an opportunity for the economy to develop rapidly, thereby bringing about changes in the structure of the national economy. The expansion of



numerous industries in various sectors supports Indonesia's development efforts [35]. According to Radianto [7], a nation can be said to have undergone industrialization when it reaches the point where the industrial sector dominates the economy. Industrialization is a structural transformation in a country. Therefore, the industrialization process can be defined as a process of changing the economic structure where there is an increase in the contribution of the industrial sector to consumer demand, GDP, exports, and employment opportunities [36].

The agricultural sector is reported to have a close relationship with the industrial sector. Agro-industry-oriented economic development is the right industrialization strategy for Indonesia. Most of Indonesia's resources are in the agricultural sector, and the majority of its people still rely heavily on it [32]. Radianto [7] stated that the agricultural-based processing industry is a sector that will encourage high national economic growth, especially small and medium-scale agro-industry. The agroindustry is a leading sector for Indonesia's economic development. It is reported that each country has a different process of industrialization. The industrialization process is a logical stage in the process of changing the economic structure, which is marked by an increase in the contribution of the manufacturing industry sector, employment opportunities, as well as total production and exports [7].

The ability to process raw materials into finished products is an impediment to the development of Indonesia's agro-industry. It is reported that some medicinal plant commodities exported by Indonesia are raw materials with a processing retention index of 71-75% [36]. Exports of Indonesian medicinal plant materials are reported to have not been able to penetrate the regulations on the quality of export commodities in destination countries [8]. In Indonesia, processed agricultural products account for 25-29% of total exports. This condition will reduce the added value obtained from the export of these products, especially in the industrialization of medicinal plants nationally and internationally. If the primary and secondary sectors have helped to boost the GDP, create more jobs, and distribute income fairly in a region, that area is said to be industrialized. By planning and developing a suitable environment for production, processing, and marketing, the industrialization of medicinal plants can develop in the long term [37].

Medicinal plants make a significant contribution to the study of industrialization in modern drug discovery. Research and the pharmaceutical industry are reported to prioritize research on the discovery of new chemical components of medicinal plants, production knowledge, and product trademarks [10]. However, in the development of the industrialization of medicinal plants, research, development,



and capital are needed to increase scientific studies and knowledge of medicinal plant pharmacology. The role of research institutions in assessing the bioactive content of medicinal plants is needed to support information that can be used in pharmacology [6]. Multidisciplinary studies on the potential and optimization of existing resources are needed to improve regional/global networks, human resources, infrastructure, exchange of expertise, capacity building, and government policies [37].

Industrialization must be a consideration in implementing its development strategy. These considerations include sufficient sources of raw materials and production factors, the adequate potential for domestic and foreign demand, encouraging the development of domestic and foreign industrial sectors. Expanding opportunities, reducing dependence on imports, reducing trade balance deficits, and saving foreign exchange reserves are also among the considerations [36]. Several countries have been reported to have succeeded in industrializing, particularly those related to medicinal plant products in Asia, including China, Korea, India, Indonesia, Malaysia, Myanmar, Sri Lanka, Thailand, and Vietnam [7]. Industrialization of medicinal plants is also reported to have occurred globally. Traditional Chinese Medicine (TCM) has long built a strong foundation in Europe by making great strides in law, education, research, international exchange, and technology. There has been extensive development space in Europe and countries in Asia and the Southeast [38]. To keep pace with the growing use of medicinal plants, research and scientific studies in a broader sense are needed in industrial studies to strengthen primary sector industries [39] and supply chains for financial independence [40]. Comprehensive information on the production, use, commercialization, and management of medicinal plants is needed to fulfill the study of the industrialization of medicinal plants in the future [29].

CONCLUSION

The industrialization of medicinal plants is part of the process of transforming the structure of the economy from agriculture-based to industrial-based. Industrialization of medicinal plants in Indonesia is a process of increasing the contribution of the industrial sector, both the primary sector (providers of raw materials) and the secondary sector (pharmaceutical, pharmacological, and traditional medicine manufacturing industries). Optimizing the medicinal plant industry as a leading sector in industrialization will have a positive impact on increasing the added value of medicinal plant commodities, increasing consumer demand, increasing the value of GDP, and increasing the value of exports and employment. Industrialization of medicinal plants can benefit regional and national



economies, particularly small and medium-scale agro-industry, by encouraging economic growth and improving welfare, particularly for farmers and communities, through income distribution and development welfare. Agro-industry-oriented economic development is the right industrialization strategy for Indonesia.

³⁸**AUTHORS' CONTRIBUTIONS**

All authors contributed to the sourcing of articles and ¹⁸the writing of the manuscript.

CONFLICT OF INTEREST

All authors declare that there is no conflict of interest in the publication of this article.



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<https://doi.org/10.18697/ajfand.120.22410>

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Table 1: Indonesia's Share of GDP from the Manufacturing and Agricultural Sectors for Five Years

Sectors Playing a Role in GDP pangsa	GDP Share Value (%)				
	2017	2018	2019	2020	Second Quarter of 2021
Manufacturing sector	13.6	12.81	12.71	13.70	19.29
Agriculture Sector (Pharmaceutical and Medicinal Plants)	20.16	19.86	19.71	19.88	14.27

Source: CSA [31]

Table 2: Contribution of the Medicinal Plant Industry to GDP and Employment in 2020

National Contribution	National GDP (%)		National labour absorption (%)	
	Oil and Gas	Non-Oil and Gas	Agriculture Sector	Manufacturing sector
In 2020	47.06	52.94	29.76	13.61

Source: BPS, 2021 [17]



Table 3: The Number of Growing Medicinal Plant Industries in Indonesia

Years	Island	PI	TMI	TMSB
2016	Sumatera	6	1	45
	Jawa	204	109	721
	Kalimantan	0	1	20
	Sulawesi	0	1	42
	Papua	0	0	0
2017	Sumatera	6	2	316
	Jawa	220	129	2645
	Kalimantan	0	2	127
	Sulawesi	0	2	97
	Papua	0	0	0
2018	Sumatera	6	2	128
	Jawa	221	129	1760
	Kalimantan	0	2	16
	Sulawesi	0	2	72
	Papua	0	0	0
2019	Sumatera	6	2	147
	Jawa	219	131	1724
	Kalimantan	0	2	16
	Sulawesi	0	2	68
	Papua	0	0	0
2020	Sumatera	6	2	143
	Jawa	224	138	1720
	Kalimantan	0	2	16
	Sulawesi	0	2	70
	Papua	0	0	0

PI: Pharmaceautical Industry; TMI: Traditional Medicine Industry; TMSB: Traditional Medicine Small Business;
 Source: Indonesia Health Profile [7]



<https://doi.org/10.18697/ajfand.120.22410>

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