

## CHAPTER 5 – HERBAL INDUSTRY IN INDONESIA

For institutions or universities that have the idea of making products from herbal plants such as lemongrass and ginger that have potential antidiabetic activity and the mechanism for commercializing them as health products, business partners, in this case, the herbal industry, are needed to commercialize these products so that we know what form the product is in can be commercialized and what regulations must be met when entering the herbal industry. Therefore, in this chapter, in depth interviews are conducted. Academics, Businesses, and Governments will be interviewed to find out the bridge of research to a business or even to the market with the expectation to develop strategies to commercialize herbal products.

In this interview, there are several topics to be done, such as the role of each field in the herbal world in Indonesia, the process of herbal development in Indonesia, the downstream of research, herbal products for anti-diabetic, lemongrass, and ginger for anti-diabetic herbs, prospects of herbal products in Indonesia, herbal products marketing, sales of herbal products at the hospital and herbal product commercialization process. These topics will be asked to three different professions to see their opinion and it will be compared later on.

Here are the question and answers about the topics that are being asked in this interview:

### 5.1 The role of each field in the herbal world in Indonesia

<b>Questions</b>	<b>Source 1 (Mr.Kholis)</b>	<b>Source 2 (Mr.Hery)</b>	<b>Source 3 (Mr.Victor)</b>	<b>Source 4 (Ms.Prapti)</b>	<b>Source 5 (Ms.Novi)</b>
<b>The role in herbal world</b>	Head of Academic Research and Community Service	Researcher and lecturer in herbal and traditional industry	Business development and R&D	Medical doctor and also a herbal Therapist	Head of Information, and audit for herbal products

<p><b>Collaboration between ABG in commercializing herbal products</b></p>	<p>Has been funded by the government and collaboration with international (Malaysia)</p>	<p>No collaboration in herbal field, but in chemical synthesis the research is funded by the government through a university applied research scheme</p>	<p>Collaborate with several institutions (university and government), triple helix (ABG) or penta helix (ABG Innovator and Community)</p>	<p>Yes, but not too optimal yet</p>	<p>No collaboration at Balai BPOM , but it just about to start a collaboration with Surakarta University</p>
<p><b>The role in improving the position of Indonesian herbs in market competition</b></p>	<p>Support them from the scientific side</p>	<p>Educating students to have sufficient insight to develop herbs and inspire students to do research in herbs field to improve herbal medication</p>	<p>In terms of the profession related to the organization (speak in several seminars) and more activities work as an individual</p>	<p>Doctors become educators to give understanding about illness and health</p>	<p>Audit herbal product to make sure it is safe for consumer and can be marketed widely</p>

Overall, each profession has a different point of view of its role in the herbal world, we can refer to table 13 that most of them are researchers that have different kinds of research in their field, the first source is for the academic field Mr. Kholis Audah, Ph.D., he is the Head of Academic Research and Community Service in Swiss German University. His role is doing some research in the herbal field, especially from mangroves, then there is Dr. Hery Susanto, S.Si., M.Si., he is the Head of Chemical Engineering & Lecturer of Herbal and Traditional Industry in Swiss German University, his role is being a lecturer in Herbal and Traditional Industry and doing some research at SGU and some joint research that is not related to herbal and for the business field there is Drs. Victor Sahat Siringoringo, M.Sc., Apt. he is working as Chief Business Development and R&D in PT Deltomed Laboratories. His role is as a pharmacist, and experience in the herbal industry and business in research and development of herbal products and now he is sitting at the secretariat of GP

Jamu which is related to research and development and scientific herbal medicine. In addition, there is also Ms. Prapti as a medical doctor and also herbal therapist. Lastly, for government, there is Dra Novi Eko Rini, Apt., the one who works at Balai POM institution in Semarang, a technical implementation unit from the POM Agency as Head of Information. Balai POM function is to control drugs and food circulating in Central Java, drugs and food are not only about that but include medicine, traditional medicine, cosmetics, health supplements and food.

In commercializing herbal products, Mr. Kholis and Mr. Victor has collaborated with the government, several institutions and is open for other collaboration to have mutual benefit, to produce and upgrade products from herbal medicine to OHT and even to Fitofarmaka. In addition, Ms. Prapti also has collaboration but the collaboration is not too optimal yet. While Mr. Hery has no collaboration in the herbal field and Ms. Novi in Balai POM Semarang has no collaboration yet but is just about to start collaboration with a University. In improving the market competition position of Indonesian herbs, they have almost the same view, by supporting them with scientific research, educating the new generation, speaking in seminars and more other activities, and making sure the products are safe and follow the standard regulations.

### 5.2 The Process and Downstream of Herbal Development in Indonesia

**Table 14.** The process of herbal development in Indonesia

Questions	Academic	Business
<b>Important steps in herbal product development</b>	Laboratory process, standardization, natural resources, safety, production	Real cooperation from ABGC (academics, business, government, community), and pre-development product aspect assessment
<b>Factors to be considered</b>	Equal perceptions and awareness (natural resources and safety)	Pay attention to the resources of our industrial organization (resources, R&D, manufacturing, financial , human resources) and equalize perception
<b>Regulations as a guideline in the development</b>	It does not only regulate for the products to follow the general rules but also protect as well as to promote the products and the incentives of the research	Very concerned about complying with government and medical education regulations

<b>Potential for successful product development based on scientific versus empirical data</b>	<p>Wanted to support what has been done and use empirically so that it can be used more widely</p> <p>Even if there is local wisdom, research should still be done in order to confirm the truth, which is to strengthen local wisdom so that it can be used for further purposes, such as commercialization.</p>	<p>Almost all herbal medicines are originally based on empirical use, while based on research it must be considered carefully not just developing the product</p>
<b>In starting the research topic, should be based on</b>	<p>Coordination, communication and research background evidence</p>	<p>Based on pre-development aspect assessment, the needs and users (doctors/health workers who are familiar with herbs)</p>

**Table 15.** The downstream of research

Questions	Academic	Business
<b>The need of empirical or scientific data before new research on herbs</b>	<p>From local wisdom we can explore Indonesian natural potential herbs, but need to have sense in knowing the importance of the herbs, raise the level and research should still be done in order to confirm the truth</p>	<p>Do not just look at research from the laboratory but also see from other perspective aspect</p>
<b>Direct involvement in research</b>	<p>Yes, but not for down streaming yet for mangrove (some steps that still needed to be done)</p>	<p>The products have been developed and registered properly. Yes, but not currently for downstream (service-based research)</p>

Based on tables 14 and 15, the sources were asked about the process of herbal development and the downstream of the research. In this part, Ms. Novi is not being asked because at Balai POM Semarang their work is only to control and audit the products and later the result will be given to the central BPOM, not focusing on the research, and downstreaming of the product as central BPOM did.

From the result, academic and business have different answers, where for academic the important steps that they need are the natural resources, laboratory process, standardization, safety, and production. While for business they need medical aspects (how many samples that is need, seeing the needs in the market), then the marketing

---

aspects (market size, competition, and prize (raw material sources and others)), R&D, manufacturing aspects (to check the safety, checking the new idea, the ability to develop, following the standard, and can produce the product with the existing facilities or not (if not we can do toll manufacturing to other company)), then it will go to financial aspects (to see if it is profitable for the long term) and regulatory aspects (if can it be registered). Because developing new products is expensive, when we do not do pre-development it will be expensive and useless if there are problems. In addition, also need to have real cooperation from the academics, business, government and community. The factors that need to be considered in the steps above is to equalize perception between academics, practitioners, businesses/ industry, and government, then the awareness of the safety and usage of the natural resources and pay attention to industrial organization aspects.

In starting a research, both empirical and scientific research is needed, because almost all herbal medicines are using empirical data and to support it, research needs to be done and needs to be considered and being communicated carefully for the future of the new product in the market by seeing the medical, marketing, R&D, financial, manufacturing and regulatory aspects assessment, so it can be potential for the success of the product development. Additionally, even if there is already empirical data or local wisdom, we as future researchers need to have a sense of knowing the importance of herbs in Indonesia by confirming the truth and can raise the level of Indonesian products from Jamu to at least OHT or even Fitofarmaka.

In table 14, about the regulations as a guideline in the development for academic is not to only follow the general rules but also protect as well to promote the products and the incentives of the research while for business they are very concerned about complying with the government regulations because those regulations are used to protect, and promote the product. Additionally, the regulations in medical education are also important.

In table 15, both academics and business are directly involved in research but for academics, they are now ready yet of the downstream due to some steps that still need to be done before the commercialization but they have other research that is not related to herbal that is in downstream phase, while for Mr. Victor, there is always a

product to be commercialized where the products have been developed and registered to BPOM by choosing a long life cycle of the product characteristics, have good and correct medical aspect assessment to ensure the usage of the product so it will last long and for Ms. Prapti, she is not currently doing downstream due to the service-based research because it is a government program so the sustainability and future program will not show results.

### 5.3 Herbal products for antidiabetic and Lemongrass and ginger for anti-diabetic herbs

**Table 16.** Herbal products for anti-diabetic

Questions	Academic	Business	Government
<b>Current use of herbal products</b>	Increasing and supported by BPOM and many people are looking for alternative herbal medicines	Currently is stable especially during this pandemic	Increasing
<b>The potential of herbal products with antidiabetic properties in the Indonesian market</b>	Indonesia has a lot of herbal potency and we must explore these potential  It will sell well, a lot of people who want a solution for diabetes that is safe and cheap	Diabetes type 2 is very high, if we want to enter herbal medicine that can help diabetics the market is big and the potential for anti-diabetes is quite large	It already exists, even in Indonesia, there is 5 OHT and 6 Fitofarmaka for anti-diabetic product
<b>Popular herbal products/plants to be commercialized as herbs with anti-diabetic properties</b>	Orthosiphon aristatus (Daun Kumis Kucing), lemongrass, ginger, Chinese petai leaves, pineapple bromelain, telang flower, kelakai and quite many other plants as alternatives to diabetes	Dandang Gendis (Clinacanthus nutans), mahogany seeds, papaya leaves and other bitter leaves, bitter melon, cinnamon, Sambiloto, brotowali, cinnamon, and many other more	Aloe Vera, bitter melon, sambiloto
<b>The shape of the product affects the popularity of the product</b>	Very influential, because people want something fast and instant	Mostly in the form of tablet because it is more practical to use and education is needed	The easier it is used and consumed many people will buy it

**Table 17.** Lemongrass and ginger for anti-diabetic herbs

Questions	Academic	Business	Government
<b>The use of lemongrass and ginger for herbs in Indonesia</b>	It is very widespread Will continue to grow (the two plants have been studied a lot)	Mostly used in food and beverages	It is very widespread
<b>Efficacy of lemongrass and ginger are known</b>	Ginger is to warm the body, cough, sore throat, to increase immune body, treat coughs, flu, relieves sore throats , high vitamins and antioxidants and others, while lemongrass it is for aromatherapy	Ginger used for cooking, essential oil, flatulence, colds, mild analgesics, while for lemongrass is for Anti-inflammatory	Ginger is used as body warmer, anti-nausea, while lemongrass is for anti asthma
<b>Information about the antidiabetic properties for lemongrass and ginger</b>	Have heard about it, but do not know about the mechanism, the work to treat diabetes, for what type of diabetes and others	Yes, but for ginger bioactive compound (gingerol and shogaol) are not efficacious as hypoglycemic agent	Does not know about the information
<b>Potential for commercializing anti-diabetic products from lemongrass and ginger</b>	There is always a potential, one thing that should be considered when they are mixed	There is always a potential, as long as in good packaging, good stability, shelf life, there is proper and intensive education and clinical trials become commercialization capital modal	There is always a potential

Based on table 16, all profession have a perspective that the current usage of herbal products are stable or even increasing by the support of BPOM in helping to give permit the use of herbs, then in many cases, people are looking for alternative herbal medicines because of desperate with their sickness, and also due to this pandemic of Covid -19 to increase the immune body.

While herbal products for anti-diabetic, they can see the potential in the Indonesian market because diabetes in Indonesia is very high where it is almost 20% of the population especially diabetes type 2, so people would look for a solution with herbal product in parallel or as conjunction therapy with modern medicine such Metformin and other agents. Additionally, Indonesia has a lot of herbal potency for anti-diabetic

just need to observe and learn more about the potency and if we want to enter herbal medicine in the market, the potency is quite large enough and there are already 5 Obat Herbal Terstandar and 6 Fitofarmaka for anti-diabetic that already been approved by BPOM. Where the shape really affect the popularity of the product, where the easier it is to consume the more people will buy the product because many people like to use the practical once than the long method of consumption such as a tablet, capsule, or syrup, in addition education of the product is needed and important.

In their opinion, the popular herbal plants to be commercialized with the anti-diabetic claim are *Orthosiphon aristatus* (Daun Kumis Kucing), Chinese petai leaves, bitter leaves, *Clinacanthus nutans* (Dandang Gendis), bitter melon, and many other more. While the usage of lemongrass and ginger in Indonesia, refer to table 17, for them is widespread and will continue to grow because both plants have been studied, mostly used as food and beverages, both of the plants are cultivated properly and well-taken care and the economical selling value is good, so many people used them. The efficacy of both plants are also well known and it can be seen in Table 18, where for ginger, it is for cough, sore throats, cooking, increasing the immune body, body warmer, and many others, while for lemongrass it is for aromatherapy, cooking, anti-asthma, and others.

Additionally, there is always a potential for lemongrass and ginger to be commercialized as anti-diabetic products, but there should be a consideration in mixing them, the shape of the packaging (capsule, tablet, syrup, or drink), the stability of the product, and shelf life. Like for example, in tablet, although the aroma of the lemongrass and ginger is gone the shelf life and stability of the product can be a maximum of 2 years while if it is in form of a drink, the cost is higher due to the bottling and the maximum shelf life is only 1 year, so as a student or a researcher, we need to think carefully in making a product. In addition to Mr. Victor's opinion, gingerol and shogaol do not have the ability as anti-diabetic, so maybe the ginger can be used as a flavor or added as a hot sensation and the lemongrass as the base product. Ms Prapti also have the opinion that as long as there is a proper and intensive education there is a potential for commercialization lemongrass and ginger products because herbs are not everything and education is very important for the success of



eradicating diabetes and if it will be attached to the medical profession, clinical trials become commercialization capital modal.

#### 5.4 Prospects of herbal products in Indonesia

Questions	Academic	Business	Government
<b>Business/ sales of herbal products prospects in the present and in the future</b>	Very bright, when we have scientific data it will be easier to penetrate the market in global and as long as the source is still there	It is good and continue to rise (if the selection product well, follow the flow well, right momentum and education and research are carried out continuously)	Will increase, especially in this pandemic where online shop all increase rapidly

The prospects of herbal in Indonesia according to table 19, all the sources have same thoughts that it is very bright, and will continue to keep increasing as long as the source is still there and when we have the scientific research about it, and then it is going to be easier to market it globally. In addition, especially in this pandemic, many people are selling herbals in the online shop and it is increasing rapidly such as herbs that just need to be brewed or ready to drink beverages and others. The market is going to be high if the selection of products follows the trends, flows properly, sells it in the right momentum, and the entrepreneurial spirit/ think should go beyond other than the ability to mix or produce products.

#### 5.5 Other specific topics

Questions	Business	Government
<b>Herbal products are included in the hospital</b>	If it is herbal drink is only limited to the cafeteria but if OHT or Fitofarmaka and when the hospital is filled with doctors that have the same mind set about herbs then it is use according to doctor's prescription and available at the pharmacy not in the cafeteria	Do not think it can, but if the Herbal Tourism House and the drug research center can do it

**Table 20.** Herbal product marketing

Questions	Business	Government
<b>Herbal products can be sold to other countries or only in Indonesia</b>	Local domestic market is the most important and main market but the world is getting more borderless so we are concern about the globalization of the products	Local domestic market is the most important but export and import product is also being done

**Table 21.** Herbal product commercialization process

Questions	Source 3 (Mr. Victor) Source 4 (Ms. Prapti)	Source 4 (Ms. Novi)
<b>Regulations that must be met by herbal companies in registration</b>	Depends on what we register (Jamu, OHT, or Fitofarmaka) and adjust with the existing categories	Minister of Health Regulation No. 14 of 2021 and several registration data from Central BPOM
<b>Failure to register herbal products in general</b>	Production and distribution  If the company is small, in its marketing	Several data that not comply with the standard from BPOM / the product audit get grade C

Some topics are only from the angle of Business and Government because in this part it is more about the marketing, the sales at the hospital, and the regulations about the commercialization process.

On the topic of herbal product marketing in Table 19, it can be concluded that herbal products can be sold outside and inside Indonesia, but the main focus right now is in Indonesia in the local domestic market. In addition, Mr. Victor stated that the world is getting more borderless, so they are very concerned about the globalization of their products. So, the development of the international market remains their concern because it is the future of the company, not only depending on the domestic market but also being open to markets abroad. Some of their products have been through several countries such as Malaysia, Singapore, Thailand, Cambodia, Laos, Vietnam, soon in Philippines, Brunei, Timor Leste, Africa (Yemen), Nigeria, Egypt, Saudi Arabia, and also Europe (Hungary and Bulgaria). Based on the regulatory requirements, Indonesia and other countries are the same as strict because Indonesia is already included in the Global herbal Medicine Standard, so the one that is regulated

---

by BPOM is already in line with ASEAN standards. Where the ASEAN Common Technical Dossier for traditional medicine has also followed the standards that exist in Europe or America, if they relate it to Europe (EMA), they follow the same standards, so they can register in Hungary but it is very strict, where they need 1 year more to complete the existing registration requirements.

Then on the topic, sales of herbal products at the hospital in Table 20, the sources have different opinions about it. Where for Mr. Victor, if it is an herbal drink it is only limited to the cafeteria of the hospital and can be recommended verbally or from doctors or nurse, but when it is in the form of Fitofarmaka or OHT then the usage can be according to doctor's prescription and it will be available at the pharmacy not in the canteen or cafeteria, in addition Ms. Prapti also said that herbal products can be sold in hospitals as long as the hospital is filled with doctors that have the same mind set about herbs. While for Ms. Novi, in her opinion, herbal products can not be included in the hospital, but if in Herbal Tourism House and the drug research search maybe they can. In Central Java there an institute called the Indonesia Medicinal Plant Research Institute, where they research on herbal medicines and scientific medicine (all shoulder hurt/ headache later they prescribe it in herbal forms like ginger, or laos in dosage that needed to be stew), and there is also WKJ (Wisata Kesehatan Jamu) in Tegal district, where they receive at least 30 patient per day to get an herbal treatment that has been proven in the manufactured products, there is a doctor who is learning about herbs that prescribed the treatment.

Lastly, refer to table 21 about the commercialization process of herbal products. It can be seen that as an herbal industry they follow the regulations depending on what product that they want to register (Jamu, OHT, or Fitofarmaka) and adjust it with the existing regulation of the categories and Ms. Novi added that there is a new regulation regarding the licensing of the minister of health regulation number 14 of 2021 but they have not been able to examine it because there are so many of them, where it related to the IOT facilities for production permits to the minister of health (national scale) The provincial-scale UKOT then permits it to the OSS/DPMPSTSP (One Stop Integrated Investment and Licensing Service is the agency that takes care of licensing but there is a technical unit that supports background knowledge about traditional

medicine in the health office later, it will be supported by the local health office, small-scale UMOT. If there is a district or city, then the permit is to the district DPMPTSP. Each of the productions has different requirements to register based on BPOM and Kemenkes. Most of the time the industries failed to register their product to BPOM and Kemenkes because their product audit is graded C (value of the infrastructure, the result of production test, labeling, what additives are used, and others) and because of production and distribution problems. While Ms. Prapti stated that the failure to register it is because maybe the company is small and lacks marketing strategies.

### 5.6 Based on Literature

After an in-depth interview, the next step is to compare them with the literature. Based on the literature, the role of each profession in improving the competitive market for Indonesian herbs is to support the herbs by cultivating them, educating the societies, and do a collaboration between Academics, Community, Business, and Government (Suyitno & Aisyah, 2013).

The important steps in herbal product development are first to generate and screen the new ideas (from staff, customers, and others), technical, market, and financial feasibility (to screen the idea), understanding the target market, selecting the most potential idea for a new product, market and business analysis (Harnvanich et al., 2020). While based on (Handiwibowo et al., 2020), the important steps in herbal product development are formal legal aspects, technical and technological aspects, market and marketing aspects, human resource aspects, and economic aspects. While the need for empirical data or scientific data before new research on herbs, there is a paper that stated that even if there is empirical evidence of the application, there still needs to be scientific research to support it (Yuxi Li et al., 2020).

There is a paper from (Kochar Kaur, 2019) telling that lemongrass and ginger itself have the potency for anti-diabetic activity, and there also a study of lemongrass and ginger product as ready to drink in SGU where it shows it is potential to make a product with both products that resulted in additive effects for maltose inhibitory activity (Santoso et al., 2021) but the one that needs to be considered is how to

---

prolong the shelf life of the product, the packaging of the products and also the marketing analysis (would it have a long life cycle or not in the market).

Herbal products cannot be sold in hospitals for now because there is still a lack of political will from stakeholders and no sufficient standard yet for the Formulary of Traditional Medicine, but when it can be guaranteed by insurance, there still a need for ministerial regulations to provide services with traditional medicine (Widowati et al., 2020).

In comparison, there is no big difference between in-depth interviews, and based on literature, although based on literature, not all the questions can be answered, but overall they both interview and literature are similar.

