The role of forest in the knowledge production of traditional medication in Tejang Village Sebesi Island, South Lampung

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Abstract. Forest has a crucial role in elevating public welfare. It provides various products such as food, beverages, clothes, residence, musical instruments, and medicines. The medicines originated from the forest could act as the supplier for livelihood particularly for a traditional healer. The traditional healer is one of the health treatments sources for the people of Sebesi Island. For traditional healers, the forest is also beneficial in the knowledge production of traditional medication. This study purposes to examine the role of the forest in knowledge production carried out by traditional healers and identify the patterns of knowledge production. Data collection was done through interviewing, involving four traditional healers in Tejang Village, Sebesi Island, South Lampung. Another method was literature study related to the roles of forests in traditional medication and knowledge production. The knowledge production process can occur through giving agents, both human and non-human ones, namely teachers, family members, books, and dreams. The interaction between those healers with the forest also resulted in the medication knowledge. The role of the forest in the knowledge production of traditional medication is that it transforms into a place for semedi or meditation when doing ngelmu, knowledge sources about medication, and the place for the existence of medicinal plants.

1. Introduction

Forests nearly cover the third area of the world’s land and almost all of them are inhabited by custom and village society who have customary rights over their forest and have developed their lifestyle and traditional knowledge which run in line with the forest environment [2]. The community closely depends on it for their daily necessities, livelihood, hunts, shifting cultivation, farming, and forest product collection. For indirect needs, this dependency is related to the quality of air and water, water management, soil erosion protection, biodiversity, carbon sequestration, and other ecological functions. Forest also plays an important role in balancing oxygen, carbon dioxide, and air humidity, as well as people’s needs toward access to food, fuel, water, and medicines. Plants and animals correlate with religion, faith, and spiritual tradition.

Forest, in terms of conservational purposes of biodiversity, is something which the people of Sebesi Island, especially the healers, could gain profit through knowledge production of traditional medication. The community is the kind of people who really depend on traditional healers because their knowledge is highly trusted. Once a person gets sick, they firstly will do an independent medication, one of which
is through the healer. This high dependence is underlaid by the limited health facilities. Puskesmas (Public health center) itself was just established circa 1990’s on Sebesi Island. Hence from this experience, the community inevitably tends to be based on traditional healers. Starting from the process of giving birth, wedding, mortality, to disease treatment, they always involve the role of traditional healers’ knowledge. To the healers, the forest is in a direct connection with the knowledge they have. Knowledge is closely related to events, actions, and social relationships, or something that is distributed differently between particular groups [3]. In this case, the forest does not only serve to provide various kinds of medicinal herbs used for recovery and health treatment. Thus, this study aims to examine the knowledge production conducted by a traditional healer (dukun) and identify the role of forest in the production of their medication knowledge on Sebesi Island.

2. Research methods
This research was a part of dissertation research that took place on Sebesi Island. The first survey was conducted on 2-4 August 2019. The ethnographic fieldwork method took place on 12-18 October 2020 and then continued from 11 April to 30 May 2021. Data collection was done through interviews with four traditional healers who are usually called dukun or ‘orang pintar’, namely Mr. SS, Mr. FU, Mr. RH, and Mrs. ST. The information should cover how and where they obtained their knowledge (production), medication technique conducted, the meaning of forest for them, and the role of forest in the production of medication knowledge. The interview was done with the assistance of a local citizen of Sebesi Island. Data collection was also through a literature study. The literature used are those which explain Sebesi Island, regarding knowledge and its production, as well as the traditional healers in the community. Regarding the role of forests in knowledge production, we will first look at the definition of forests and knowledge. Furthermore, knowledge production will be explained based on the concepts of [3] and [1]. Based on this concept, the pattern of production of knowledge of traditional medicine by traditional healers on Sebesi Island will be explained.

3. Results and discussions

3.1 Sebesi Island overview

Tejangan Village Sebesi Island consists of four dusun (hamlets), namely Dusun Bangunan, Inpres, Regahan Lada, and Segerom. The land area used for plantation/agriculture is approximately 61.47% (1600 Ha); about 10 Ha (0.38%) is used for rainfed rice fields. The forest area is approximately 922 Ha (35.42%) located at the slope of Mount Sebesi, with an altitude of 535-845 meters above sea level. The settlement area occupies as much as 70 Ha (2.69%). Sebesi Island was directly affected by Krakatoa eruption in 1883. Sebesi is an inhabited island located 19.3 km from Mount Krakatoa. The lowland vegetation, including several plantations, was affected by the ash rain and tsunami [4]. From this impact,
Sebesi has been developed for agriculture, forestry, and urbanization [4]. This island was also hit by the tsunami in 2018.

![Figure 2. Community gardens on Sebesi Island](image)

The composition of the community is dominated by people from Banten (Serang Javanese, Sunda Javanese), coastal Lampung, Bugis (one or two people), Batak, Padang. Javanese people (Central Java and Banten) occupy by 58.2%, Lampung by 32.2%, Sundanese by 8%, and the rest are Betawi Batak, Padang, Palembang, and Bima by 1.6% [5]. The culture of Serang Javanese (Banten) and Lampung is the one that is applied on this island. The language spoken is Jaseng language, even though the names of the dusun (hamlets) use Lampungnese. Final data in 2021 show that Sebesi Island is inhabited by 2,795 people, 787 families. The largest occupation is held by garden farmers, fishermen by 150 families, civil servants by 6 people, teachers, midwives, and honorary teachers. Almost every individual owns a garden, which becomes their source of living. Some community members choose to open their own businesses, such as second-hand goods collectors, grocery stores, meatball stalls, credits counters, meatballs, vegetables, fish hucksters, or medicinal herbs pitchers.

Multiple events are held on Sebesi island which are related to religious activities. In the month Safar (Islamic calendar), the people conduct safar bath and bancakan (communal feast). Safar bath is held to ward off misfortunes. Another routine is the bancakan at night before Ramadan and Eid Al-fitr, which is generally held by each family, but it is not limited for other families to join. It is usually held on Umang-umang Island close to Sebesi or in an open field near the beach. This tradition has the tradition of togetherness, eating together in one plate (banana leaf), no difference in status, age, all deemed the same. It also reflects harmony in society.

The pier becomes a public interest for the local people. It is an area for the boats, ships, and fishing platforms to port and transport the passengers to Canti, as well as coconuts and bananas to Anyer. This pier acts as a location for the people of four hamlets on the island to assemble. It is quite packed especially when dusk falls and becomes a favourite place on Saturday and Sunday.

Public facilities on Sebesi Island include electricity, in which it has been on for 24 hours. Education facilities include Pendidikan Anak Usia Dini (PAUD) (Pre-school), elementary schools, middle schools, high schools. PAUDs are located in three hamlets, namely Dusun Inpres, Regahan Lada, and Bangunan, while elementary schools are in two hamlets, Dusun Inpres and Segenom. Tejang village has three places of worship, namely three mosques and four small mosques, sport facilities including three soccer fields, three volleyball courts, and one badminton court. For health facilities, Sebesi has Puskesmas Pembantu (Pustu) (Community Health Service) and two midwives.
3.2. Forest on Sebesi Island

The presence of forest is a concern of Sebesi community which has been living side-by-side with them since forever. Tejang Village is situated at the Lampung Bay and included as the administrative area of Rajabasa Sub-district, South Lampung Regency.

Forest also becomes a concern by many other actors or ‘stakeholders’ interested in conservation or exploitation. The utilization is especially for coconuts, cloves, pepper, banana, cocoa plantation, while the minority of it is for rice fields. In addition, forest product, including wood, is also used by the people to create boats, houses, and firewood. A type of plantation, that is cocoa, is currently being planted largely on their farms. Forest conversion into farms on this island keeps increasing, especially since Sebesi Island was sold to H. Djamaluddin in 1896, as well as when it was under the ownership of Saleh Ali (son of H. Djamaluddin), where there was a profit-sharing system between the plantation workers.
and island owner (circa 1932 to 1934). Since then, the inhabitation also kept increasing, which encouraged the forest conversion into farms, settlements, and public facilities including schools, mosques, soccer fields, pustu, and electricity companies. The community also directly utilizes forests and trees as the sources of medicines, food, and nutrition. The close contact between Sebesi community and natural ecosystem in the places they inhabit for generations is also influential to their culture.

3.3. Traditional healers on Sebesi Island

Health necessities for human beings do not only for individual need but also a collective one. The threat of disease will impend the group life existence and its community [6]. Humans may have the heart to leave or isolate one of their members who suffer from a disease. Thus, for its countermeasures, there are many community members who act as traditional healers are called dukun (shaman).

Dukun represents healing, spirituality, and the oldest community ritual [7]. The belief in spiritual creatures and shamanism tradition is not a kind of theory or doctrine, but it is more like a system of the world’s perspective that is comprehensively based on spiritual and supernatural experience [8]. A person can be acknowledged as a dukun from having supranatural competence which cannot be found in common people. For this definition, the traditional image of dukun remains intact. They are even certain of their own divine power, where most of whom believe that they are gifted by the gods or spirits from the world above [8].

Medication carried out by traditional healers is encompassed in traditional health treatment. It is based on significant local knowledge about herbal medicines. Shamanism in a short definition is a religious phenomenon in Siberia and Central Asia. It is originated from Russian, l’aman Tungusik. In other languages in Central and North Asia, the appropriate terms are Yakut oyuna (oyuna), Mongolian biigii, bagii (big, biî), and udagan (see also Buryat udayan, Yakut udoyan: “shamaness”), TurkoTatar kam (Kam altai, gam, kami Mongolia, etc.). The first definition of shamanism phenomenon is the ecstasy technique [9]. In Shamanism: Archaic Techniques of Ecstasy, Mircea Eliade characterizes shaman as an individual who enters ecstasy to interact with a spirit, representing the community [7]. Shamanism is a crucial evolution of culture and human’s awareness and creates practices to broaden the activity of ancient primates for ritual healing and group integration. In shamanism culture, most shamans deliberately seek for contact with the spirit world in the quest for vision, but only a few would be benefitted because they are chosen by the spirit for the experience and specific power [7].

According to [10], the medical system is distinguished into disease theory and the health treatment system. The former includes belief in health features, causes of illness, medication, and other healing practices used by doctors. In other words, causes of illness largely determine the decision taken regarding health treatment system. The latter refers to social regulation involving interaction between numerous people, at least a patient, and a healer. In confronting disease, the human community creates new adaptation strategies, that force them to put their concern primarily on the prevention and medication of an illness, which construct a medical system, covering the entire health knowledge, trajectory belief, and practices by the members of each community [10]. Traditional healers (orang pintar) on Sebesi Island hold a pivotal position in the medication system. The limited health facilities have caused the community to depend on dukun or a traditional healer. Pustu serves almost 3000 people, most of whom treat minor diseases. When they suffer from chronic disease, the patients will be brought outside the island to the hospital in Kalianda, Rajabasa Sub-district, South Lampung. Sebesi Island has two midwives in pustu, namely Mrs. Sari in Dusun Regahan Lada, and Mrs. Evi in Tejjang Village. However, due to the administrative matters in Kalianda, those two midwives are often unable to tend them. If they suffer from chronic diseases, such as malaria, dengue fever, typhus, which require specific treatment, they will be asked to ‘go home’ which refers to visit a bigger hospital in Kalianda. When the midwife is asked to visit them in their houses, they often immediately call the traditional healer or dukun. The belief in traditional healers is underlain by the etiology understanding of disease from Sebesi community. They are convinced that illnesses can be caused by divine power and also humans. Disease caused by divine power is deemed as a chronic one which can be healed by a dukun, or traditional healer.
The healers on Sebesi Island conduct a medication process through several ways, namely spitting, eye drops, medicinal herbs potions, and massage.

3.4. Production of traditional medication knowledge by the traditional healers on Sebesi Island

According to [3], knowledge is something which closely related to an event, action, and social relationship or something that is distributed among groups in different ways. The definition of social relationship encompasses the relationship between family members, friends, neighbors, colleagues, and others, but excluding the social contact and interaction which occurs too fast, unintentionally, or considered having limited significance ([11]. Knowledge also must be understood as a social product, which implies that somebody decides what can and what cannot be accepted as “knowledge”. It is always used by them in accordance with their own interest. It means that knowledge and power are closely intertwined into one, where the former gives legitimacy to power and vice versa, knowledge is shaped by its relationship to power [12].

Traditional medication is a part of traditional knowledge that is preserved and practiced by the community. Traditional knowledge refers to knowledge, innovation, and practice of custom and local community regarding genetic resources. It is developed through people’s experience for centuries, adjusted with the needs, cultures, the local environment, and passed down from generation to generation [13]. This knowledge is scrutinized and adopted through thousand years, which guides people in their interaction with local environment, has dynamic features which can adjust and modify people’s actions in responding to the change of environment [13]. Traditional medication depicts a group of practice and health products with a long history of utilization. It frequently refers to medical knowledge developed by the original culture which compiles herbs, animals, and mineral-based medicines, spiritual therapy, and manual techniques arranged to heal diseases or preserves its prosperity. Traditional medication tends to be practiced outside conventional drugs or western medication that is a dominant medical system in developed countries. In many cultures, traditional medication functions as a comprehensive system of health treatment which is perfected for hundred even thousand years [14].

How is knowledge produced? According to [15], the state of knowing is generated through activities such as speaking, listening, writing, and reading. It is produced under the consciousness of the receiver referring to the given information. Ingold [1] states that human generates knowledge through the selection process of self-awareness. “Knowledge” is everything that is known by an individual and as a “knowledge production” of all activities which have not been known previously, even if others have owned them [15]. In this definition, disclosure, distribution, transmission, and communication become parts of the wider concept of “knowledge production”.

Several researches pinpoint the definition of knowledge production. This term is mentioned by [15] in Knowledge, Its Creation, Distribution and Economic Significance, where the state of knowing is produced by activities such as speaking, listening, writing, and reading. At least two people are involved in this process, namely the giver and receiver.

In The Perception of the Environment, Ingold [1] remarks that human constructs knowledge through the selection process of self-awareness. In Ingold’s view [1], knowledge transfer is more likely a capacity to position that information and understand its meaning, in the context of direct perception involvement with the environment. From those two works, it can be said that there are other factors causing knowledge to be produced, like the one mentioned by Machlup [15] that there is an interaction between actors (giver and receiver). In addition, another factor mentioned by Ingold [1] is that there is a selection process that human does when producing knowledge. It is done within the receiver, in which it becomes an internal factor in the production.

Some works that examine the knowledge production are Seeing the Forest, Naming the Trees: Visuality and Knowledge Production about “Nature” in Madagascar, Kraemer [16] explores the representation of nature in the context of the struggle in gaining natural resources in Madagascar. This article determines the genealogy in knowledge production on visual-based, explores the effects through the example of mining projects in Madagascar, and briefly discusses the alternative forms of knowledge production about nature through the local perspective of the people near the mining site. In the article
In knowledge production, the important aspect is negotiation. It does not occur in a room that is vacant from social politics. They are entangled in a continuous social process in a complicated way and broaden their essential environment and where this negotiation contributes and is often modified from social politics. They are entangled in a continuous social process in a complic

3.5 Negotiation in medication knowledge production

In knowledge production, the important aspect is negotiation. It does not occur in a room that is vacant from social politics. They are entangled in a continuous social process in a complicated way and broaden their essential environment and where this negotiation contributes and is often modified [21]. Nygren
[19] in Local Knowledge in the Environment Development Discourse, states that knowledge production is viewed as a social negotiation process that involves many actors and complex power relationships. In other words, the knowledge receiver does not necessarily take it for granted, that is by a negotiation occurring in the receiver (individual) or a group (e.g community). Each actor involved attempts to insert their interest. Likewise, the findings by Michael Gibbons et. al [18] in The New Production of Knowledge: The Dynamics of Science and Research in the Contemporary Societies explore the changes in the modes of knowledge production in contemporary community. It is stated that knowledge is always produced under sustainable negotiation aspects and will not be produced until the importance or interest of many actors is included. Referring to it, the traditional healers do not necessarily receive the knowledge. The obligatory requirements are parts of this negotiation. They are capable to do fasting in a long-term process because there exists a specific purpose, that is becoming a medication expert.

Regarding this negotiation, every traditional healer negotiates in the production of knowledge. Mr. FU studied when his wife was 5 months pregnant with their first child. Likewise with Mr. SS where negotiation was carried out when he had to leave his family to meditate in the forest. When receiving knowledge through dreams, Mrs. ST also negotiated, in which she couldn't refuse the dream she had, because from that she had to be ready to become a traditional healer. Mr. RH also had to negotiate when he had to frequently leave his family to get medical knowledge. The medication knowledge was obtained from Makassar, South Sulawesi. During his study period, Mr. RH also had to be ready to go back and forth to Sebesi Island.

3.6. Patterns of medication knowledge production by traditional healers on Sebesi Island

Based on the results, the patterns can be analyzed. The first pattern is started with learning. In this process, there is an interaction between the giver and receiver. The teacher acts as the giver and the healer as the receiver.

![Figure 5. The first model of knowledge production pattern](image1)

![Figure 6. The second model of knowledge production pattern](image2)
In the first pattern, the important actors are the receiver and the giver, and there is an interaction between them. In Figure 1, knowledge is produced after undergoing the learning process, where knowledge is obtained from the teacher directly. In Figure 2, it is carried out after going through the teaching process and observing from family members themselves such as grandmother or mother. Elderly people usually have higher knowledge and abilities in medication. Family members who have this knowledge also work as traditional healers, shamans, or ‘orang pintar’. In Figure 3, it is done after the traditional healer acquires a dream where it becomes an agent that functions as the giver. In this case, the dream refers to a non-human agency. Based on the actor-network theory (ANT), the agency does not only manifest in the relationship between actors. ANT uses the term actant to distinguish its conception of an actor embedded in network relationships from its more traditional conception. In a society, human and non-human actants develop a social order similar to the structure found in other social theories [22]. It means that agency is not limited to individual human actors but is also extended to the word actor -or actant- which refers to non-human, non-individual entities [23]. This also applies to the fourth model, where knowledge production is also carried out after learning from books. Here, books become agents in the production of medical knowledge for traditional healers on Sebesi Island. Another thing noted is that there are intentional and unintentional aspects. Some traditional healers consciously want to learn medication, while the other unintentionally acquire knowledge through dreams. Traditional healers deliberately learn from teachers, family members, and medical books, then they practice them. In addition to studying and learning from a teacher, traditional healers also observe the treatment process carried out by other shamans. Another aspect is the unintentional aspect, where a person suddenly dreams that causes him/her to have the ability to heal.

Based on the results, the factors that affect the production of knowledge can be grouped. The first factor is the role of other influential agents, namely family support. This means that knowledge production can go well because family members also support it. The second factor is the role of the
closest people, in this case, friends, when they also learn, so do traditional healers. The third factor is the social context that occurs, where traditional healers intend to study medicine because they are in a state of incapacity and difficulty, so they have the desire to help others who are also in the same situation.

3.7. The role of forest in the production of traditional medication knowledge
The people of Sebesi Island have a high dependence on the forest. Forest is mainly used as a source of their livelihood, namely by converting the forest functions into gardens, such as coconut, banana, and cocoa plantations. Apart from that, the forest also functions to meet the necessities for medicinal herbs. Today, medicinal herbs play an important role, both as a preventive and curative measure, despite advances in modern medication. Until now, Sebesi people are still actively using them taken from the forest. Although treatment by midwives has been used by the community, it is undeniable that medicinal herbs still play an important role in healing diseases on Sebesi Island.

What is the role of the forest in the knowledge production of traditional healers on Sebesi Island? Forest occupies a role as part of the flow of knowledge production. The role starts from the beginning of the study of medical science until when the medication knowledge is produced (Figure 9). One of the conditions that must be met by traditional healers is meditating. The forest becomes a place to 'ngelmu' (seeking for knowledge) and meditate. It is defined as a place that blends with nature, with all living things in it. While meditating, traditional healers also fast. For example, Mr. SS did his meditation in the Krakatoa Forest, Sebuku Island, and Sertung Island. Another role is that biodiversity is an asset for knowledge production. Animals and plants both have a function as traditional medicinal ingredients. Related to this, traditional healers take different types of plants to be used in their treatment. Based on the results of interviews, plant species such as ‘sigugut’ (*Cheilocostus speciosus* (J.Koenig) C.D.Specht) is one of the species taken from the forest to be used as medicine. *Sigugut* is used to treat pain during menstruation. Another type of plant is *raja wengi* (*Mikania cordata* (Burm.f.) B.L.Rob.) which is used to treat stab wounds, by chewing the leaves and attaching them to the wound. In treating patients, there are traditional healers who take plants directly from the forest, while some plant them in their own yard. The purpose of picking and then planting it again is so that it does not run out in the forest as part of a conservation strategy. In addition, planting in the home garden aims to make it easier to pick when needed.

Another role of forests is as part of the requirements in completing medical science learning. The types of plants in the forest are medicinal plant species that must be used in accordance with the instructions from the teacher. Therefore, in this case, the forest plays a role in fulfilling the requirements in the treatment phase. Another role is the existence of the forest and the species in it to ensure the sustainability of the knowledge of traditional medicine. In his research, Rao [24] reveals that the reproduction and transmission of knowledge is as important as the creation itself. Knowledge exists through the process of reproduction and transmission, also because of the creation, as well as the role of forest in knowledge production, that is, the role of the forest as a place to meditate, 'ngelmu' as well as the presence of the types of plants and animals used as medicinal ingredients, which contributes significantly to the continuity of medical knowledge. Medical knowledge exists because it is produced. The stock of knowledge is directly proportional to the knowledge production process, where there is an interdependence relationship between these two. When the forest continues to exist, the production of knowledge can continue.

Figure 9. The role of the forest in the production of traditional medication knowledge
4. Conclusion
Based on the research, there are four patterns formed in the production process of medical knowledge by traditional healers on Sebesi Island. The knowledge production process can occur through giving agents, both human and non-human ones, namely teachers, family members, books, and dreams. In the knowledge production process, there is a process of selection and negotiation. Learning knowledge of medicine is also driven by intentional and unintentional factors. Knowledge production process is driven by social context factors, where knowledge acquisition is done when traditional healers are in difficult states, so they intend to help people through medical science. Another factor is the support from close people such as family who also have the ability to treat and friends who also learn about medication. Forest plays an important role in the production of medication knowledge by traditional healers on Sebesi Island. The level of production determines the existence/stock of knowledge, that there is an interdependence relationship between the two. If one of them changes, it will affect the continuity of the others. Forest also functions as a preserver of biodiversity which is used as ingredients for natural medicines. This means, if there is a disturbance in the forest, which causes the extinction of biological diversity, knowledge of medicine will be lost gradually because there are obstacles in the production process. This process can be used as a reference in understanding the continuity and change of medical knowledge in society.

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