



Food Sovereignty For Indonesia: The Epistemological Dimension of Knowledge and Variety of Local Food

Sugeng¹, Annisa Fitria²

¹Ilmu Hukum, Universitas Bhayangkara Jakarta Raya, Indonesia
E-mail: sugeng@dsn.ubharajaya.com

²Ilmu Hukum, Universitas Esa Unggul, Indonesia
E-mail: nisa.1971@gmail.com

Info Artikel	Abstract
<p>Received: 2023 March 11 Accepted: 2023 April 7 Publish: 2023 April 25</p> <p>Keywords: Food Sovereignty; Epistemological Diversity; Legal Framework</p>	<p><i>This article aims to emphasize that food sovereignty policies require the support of knowledge that is not singular. Epistemological diversity is believed to produce richer and more contextual knowledge of the needs of local communities. In the process of formulating public policies, scientific knowledge needs to be paired with local knowledge developed through oral traditions. This approach is in accordance with the geographical conditions and natural resources of Indonesia, which has a rich biodiversity and diversity of foodstuffs in various regions. Indonesia's ethnic diversity and biodiversity are advantages that need to be maintained for sustainable food sovereignty. This philosophical study is useful as a basis for compiling a more comprehensive food sovereignty legal framework.</i></p>
<p>Kata kunci: Kedaulatan Pangan; Keragaman Epistemologi; Kerangka Hukum</p> <p>Corresponding Author: Sugeng</p> <p>E-mail: sugeng@dsn.ubharajaya.com</p> <p>DOI: 10.38043/jah.v6i1.4179</p>	<p>Abstrak</p> <p><i>Artikel ini bertujuan untuk menegaskan bahwa kebijakan kedaulatan pangan memerlukan dukungan pengetahuan yang tidak tunggal. Artikel ini merupakan kajian filosofis yang bermanfaat sebagai dasar penyusunan kerangka hukum kedaulatan pangan yang lebih komprehensif. Artikel ini menggunakan metode studi Pustaka dan metode refleksi kritis. Keberagaman epistemologi diyakini akan menghasilkan pengetahuan yang lebih kaya dan kontekstual dengan kebutuhan masyarakat lokal. Dalam proses perumusan kebijakan publik, pengetahuan ilmiah perlu disandingkan dengan pengetahuan lokal yang dikembangkan melalui tradisi lisan. Pendekatan ini sesuai dengan kondisi geografis dan sumber daya alam Indonesia yang kaya akan keanekaragaman hayati dan keragaman bahan pangan di berbagai daerah. Keanekaragaman suku dan keanekaragaman hayati Indonesia merupakan keunggulan yang perlu dipertahankan untuk kedaulatan pangan yang berkelanjutan.</i></p>

I. Introduction

The awareness to build independence and national food security has been mandated by the founders of the Indonesian nation in the past. When laying the first stone for the campus building of the Faculty of Agriculture, University of Indonesia (now IPB University), President Soekarno (Bung Karno) loudly advised "The problem of food is a matter of life and death for the nation". Because of the importance of the nation's narrative of survival, until the first president emphasized that the substance of the message was not only for agricultural scholars, but also for all Indonesian people, especially youth as controllers of the future. The narrative of the speech was spoken in 1952. Seven years after the proclamation of independence, when the population was still around 82.9 million people, and is increasingly relevant to today's and future conditions, when the population is projected to increase by 282 million people, in 2025¹.

A large population on the one hand reflects strength, because it is the potential of human resources (HR) of a nation. On the other hand, this is also a complex challenge that must be faced. With a large population, appropriate regulations and policies are needed in terms of food supply, housing, education services, health services, employment opportunities, and others. Developing human resources is the main program of the five priorities of the government of President Joko Widodo and Vice President Ma'ruf Amin, in addition to programs for infrastructure development, deregulation, simplification of the bureaucracy and economic transformation.

National development not only increases economic growth and provides infrastructure and physical facilities, but also strengthens the quality of human resources, which are the main assets of a nation. For Indonesia, preparing superior human resources is an effort that is not negotiable, to welcome strategic opportunities and may not be repeated again, which is called the "Demographic Bonus"². The term demographic bonus refers to the great opportunities that a country can enjoy due to the dominance of the proportion of the productive age population. The demographic transition is indicated by an increase in the productive age population (15-64 years), accompanied by a delay in the increase in the young population (under 15 years), and the decline in the elderly population (over 64 years)³. Demographic dividend is the acceleration of economic growth that can be achieved by a country due to a low dependency ratio, where the proportion of the productive age population is greater than the number of people who are not working (children and the elderly). Under these conditions, economic benefits can be achieved due to the potential for increasing the amount of savings and investment that can encourage national economic growth⁴.

The economic benefits arising from the demographic bonus can be enjoyed by a country, with two assumptions: *First*, the country's economic growth is stable and of good quality, so that it can absorb the existing workforce. *Second*, the Human Development Index (IPM) is in good condition, which allows people of productive age to live quality lives, so they are able to fill existing job opportunities. If these two

¹ Biro Pusat Statistik, 2018. h. 17.

² Mukri, S. G. (2018), "Menyongsong Bonus Demografi Indonesia", *Adalah*, (Vol. 2, No. 6). h. 51-52.

³ Jati, W. R. (2015), "Bonus Demografi Sebagai Mesin Pertumbuhan Ekonomi: Jendela Peluang Atau Jendela Bencana di Indonesia?", *Populasi*, (Vol. 23, No. 1), h. 1.

⁴ Ross, John (2004), "Understanding the Demographic Dividend", *Policy*, h. 29.

assumptions are not present, then instead of getting a demographic bonus, the country in question will instead get a "demographic disaster". The development of superior human resources has complex dimensions and is directly related to the quality of human life since they are still in the womb until they are old. The availability of nutritional intake from food ingredients is an essential condition, which will not be sufficient if it is limited to only a few types of staple foods, namely rice, corn and soybeans. A strategic plan and real action are needed so that diversification of food ingredients based on local characteristics becomes a common awareness and lifestyle.

From the supply side of food (especially rice), assuming per capita consumption of rice per year is 114.13 kg (3 ounces per day)⁵, it can be calculated that additional rice production must be prepared, if the Indonesian population increasing by 4 million people per year. This projection will be more complex if the calculation is expanded to include the community's need for other plant-based food items, such as corn, soybeans, vegetables and fruits, as well as the adequacy of animal-based foodstuffs such as beef, chicken meat, milk and chicken eggs. The increase in rice consumption is in line with high population growth from year to year. Although it has succeeded in reducing rice consumption to a level of 114.13 kg per capita per year in 2017, from previously 154 kg (2011) and 134 (2015), but compared to rice consumption in other countries, rice consumption in Indonesia is relatively low. higher, if not the tallest. To find out the consumption of rice per capita per year in Thailand is 100 kg, the Philippines is 100 kg, China is 90 kg, and India is 74 kg⁶.

Meanwhile, as an agrarian country where most of the population lives from the agricultural sector⁷, rice production in Indonesia still lags behind two other countries with strong agricultural sectors, namely India and China. The two countries each have a harvested area of 43.32 million hectares (26.57 percent of the world's total rice harvested area) and China has a rice harvested area of 30.23 million hectares (18.54 percent), while Indonesia is ranked third, with a rice harvest area of around 13.51 million hectares (8.27 percent)⁸. Without an appropriate policy response, it will be difficult to increase rice production because the rate of conversion of land from agriculture to non-agriculture continues. The reduction in agricultural land is due to the rapidly growing needs of industrialization, human settlements, and transportation. This phenomenon does not only occur in Indonesia, but also occurs in almost all countries as a consequence of the massive industrialization process. In Indonesia, the average rate of land conversion reaches 100,000 hectares per year, far above the government's ability to expand agricultural land, which is only 30,000 hectares per year⁹. This condition is a big challenge for our nation, on the one hand the need for food is increasing, while agricultural land is shrinking.

Food security and self-sufficiency are the main indicators in assessing the quality of life of a nation's people, in addition to other indicators, such as education and a decent

⁵ Biro Pusat Statistik, 2017. h. 25.

⁶ Nuryati, Leli, Budi Waryanto, dan Roch Widaningsih (2016), *Outlook Komoditas Pertanian Padi*. (Jakarta: Pusat Data dan Sistem Informasi Pertanian), h. 32.

⁷ Anggriawan, & Indrawati, T. (2013), "Peranan Komoditi Gambir Terhadap Perekonomian Kabupaten Lima Puluh Kota Provinsi Sumatera Barat", *Jurnal Ekonomi*, (Vol. 21), h. 1-21.

⁸ Nuryati, Leli, Budi Waryanto, dan Roch Widaningsih (2016), *Op. Cit.*

⁹ Marita, Leny, Mohammad Arief, Nurita Andriani, Muhammad Alkirom Wildan (2021), "Strategi Peningkatan Kesejahteraan Petani Indonesia, Review Manajemen Strategis", *Agriekonomika*, (Vol. 10, No. 1), h. 1-18.

standard of living, and are part of human rights (HAM), as emphasized in Article 28C of the 1945 Constitution, which obliges the state and government to fulfill them. Based on the three dimensions of the human development index (IPM) or Human Development Index (HDI), namely: 1) life expectancy and health; 2) Knowledge (Education); and 3) Decent standard of living, BPS conducts periodic surveys of the quality of life of the Indonesian people. In 2018, the top five HDI rankings were occupied by DKI Jakarta, DI Yogyakarta, East Kalimantan, Riau Islands and Bali. While the five lowest HDI rankings are West Kalimantan, West Sulawesi, NTT, West Papua and Papua.

At the regional and international levels, Indonesia's HDI rating is far from satisfactory, because it still remains at the middle level (Medium Human Development Index). This annual report places Norway, Switzerland, Ireland, Hong Kong and Australia at the very top because they managed to achieve the highest HDI (very high development index). While the five lowest positions are occupied by Burundi, Sudan, Chad, Central African Republic, and Nigeria, which occupy the position of Low Human Development Index. At the international level, Indonesia is in 111th position, below Uzbekistan and Libya, and above Samoa and South Africa¹⁰. The issue of food security has been widely studied through various approaches from various fields of science. In the field of social humanities, Heri Suharyanto conducted a study on food insecurity in Indonesia, which is characterized by insufficient food needs, both in quality and nutritional quality. This is one of the paradoxes faced by Indonesia, which is known as an agricultural country with vast potential for agricultural land¹¹.

This article attempts to examine the importance of utilizing local knowledge (indigenous knowledge) to explore and promote the diversity of local food ingredients in various regions. Science has proven that the source of carbohydrates is not only rice, but also found in several other food ingredients, such as sweet potatoes (*Ipomea batatas*), cassava (*Manihot esculenta*), taro (*Colocasia esculenta*), kimpul (*Xanthosoma sagittifolium*), yam (*Dioscorea alata*), arrowroot (*Maranta arundinacea*), canna (*Canna discolor*), and others. Local knowledge of various food sources needs to be considered in policies to strengthen national food sovereignty. The main thesis of this article is that public policies in the field of food sovereignty will be more effective if they provide space for local knowledge related to the diversity of food sources. Thus, the policy formulation cycle needs to develop and accommodate epistemological diversity.

It is different from other food security research which emphasizes regulatory, institutional, food diversity, or agronomic aspects. This article focuses on the philosophical dimension, particularly on the importance of accommodating local knowledge in determining food alternatives. Epistemologically, local knowledge-based ideas need to be given space to enrich public policy.

II. Methodology

As a philosophical study, epistemology aims to find the general and essential characteristics of human knowledge. This study also aims to critically examine the presuppositions, assumptions, and logical conditions that underlie the possibility of knowledge, and tries to provide accountability for truth claims and their objectivity¹². In

¹⁰ <https://annualreport.undp.org/2019/>, accessed on March 4, 2023.

¹¹ Suharyanto, Heri (2011), "Ketahanan Pangan", *Jurnal Sosial Humaniora*, (Vol. 4, No. 2), h. 186-194.

¹² Pranarka, A.M.W (1987). *Epistemologi Dasar: Suatu Pengantar*, (Jakarta: CSIS). h. 3-5.

this research, critical reflection will be directed at the concept of traditional knowledge which is also referred to as local knowledge. This knowledge is a concept of knowledge that comes from the experience of the community in an area and is associated with the natural resources they have. Local knowledge is useful for maintaining the sustainability of ecological systems in an area. In the context of food sovereignty policy, the concept of local knowledge also has the potential to increase public awareness about the importance of utilizing biodiversity to develop alternative food ingredients.

This research uses the library study method, through searching books and scientific articles in both print and electronic versions. The document includes national food policy, epistemological theory, and local knowledge. To sharpen the discussion, this research also uses the method of critical reflection to assess the justification for the truth of local knowledge in the social epistemological dimension. In social epistemology, social relations, social interests, and social institutions are seen as determining factors in the process, method, and acquisition of knowledge.

III. Result and Discussion

1. Food Sovereignty Concept

Food security is the basis of national development, which is not only in the form of food availability at the national and regional levels, but also at the household and individual levels. There are at least two fundamental questions related to a country's food security, namely: 1) What is the state's view (philosophy) on food and 2) How does the state play a role in meeting the need for food. A country's philosophy on food and how food security is strengthened will influence efforts to increase food self-sufficiency and sovereignty, as part of realizing national competitiveness in world affairs.

Every dish that is served at the family dinner table, cafe, restaurant, or *angkringan* and food vendors on the side of the road, has a series of complex stories. A plate of rice, for example, comes from grains of rice that have been peeled (husk) through a rice grinding machine, or pounded using the old method. The rice originates from selected healthy seeds, which are used as rice seeds. With appropriate spacing, the rice plants are cared for, water and soil nutrient requirements are met, weeds are kept away from disturbing plants that will inhibit growth, and protected from pests and plant diseases. Luckily, Indonesia, especially the island of Java, which has a tropical climate with sufficient sunlight and rainfall, is very suitable for the needs of rice plants.

The story of a plate of rice earlier, shows the hard work of farmers. To produce fluffier rice, not only capital is needed, but also farming skills, conducive climate and weather, appropriate nutrient content, and perhaps also love and militancy. "No easy harvest", so say Milikan and Hapgood, in their good and empathetic book: "No Easy Harvest: The Dilemma of Agriculture in Underdeveloped Countries" (Mimilikan 1967, 7). Regarding the difficulty of the peasant struggle, especially in developing countries, Richard Henry Tewney has the right illustration¹³:

"There are areas where the position of rural residents (farmers) is like a person who forever stands submerged in water up to their necks, so that even a small wave is enough to drown them."

¹³ Tawney, Richard Henry (1966), *Land and Labour in China*, (Boston: Beacon Press). h. 77.

Thus, Tawney tells the story of farmers in China in 1931, and in general they are not much different from the fate of farmers in several Southeast Asian countries, especially in Myanmar, Vietnam and Indonesia. Farmers control narrow lands, around 0.25 hectares and limited capital. This knowledge can help us to understand the position of farmers, who are at the forefront of developing self-sufficiency and food security. Thus, the Indonesian people should pay tribute to the hard work of farmers in the form of buying Indonesian farmers' products. For farmers who live in subsistence or mediocre conditions, the threat of crop failure, a long dry season, and soaring prices for production inputs, is a real threat. Around 250 years ago, countries that were currently industrialized were also at about the same level as developing countries today.

As a basic need for every citizen, food is also the identity of the nation. When a country is unable to meet the food needs of its people, it will certainly be difficult to build other sectors, if you don't want to be called a "failed state"¹⁴. When people feel more honored to buy and consume food from other countries compared to food produced by farmers from their own nation, it can be the beginning of food imperialism (Food Imperialism). The defeat of farmers due to the impact of climate change, natural disasters and business risks, global economic turmoil, and an impartial market system, can start our defeat as a nation. One thing is certain, poverty in countries in Sub-Saharan Africa, Central America, and South Asia easily causes upheaval and rebellion.

The type of food and how much to consume is a personal and rational consideration. However, where the material is obtained from and how attitudes and outlook on life are towards it, is a matter of philosophy and ideology. When we enjoy a portion of food whose raw materials come from other countries, that means we are supporting the farmers of the country concerned. At the same time, leaving our farmers alone. This is one of the ironies that occurs in an agrarian country like Indonesia, because the agricultural sector is not only related to economic and trade matters, but also comes into contact with social, cultural and political issues. Compared with the policy of the United States (US) government, as a developed industrial country, it pays great attention to the agricultural sector, by providing direct financial assistance, including buying excess agricultural products. For this protective policy, the US government has prepared funds of up to USD 12 billion¹⁵.

Food imperialism is not an exaggeration and without foundation. Studies conducted by Gerardo Otero, Gabriela Pechlaner, and Efe Can Gürcan, show that there are differences in dependence on food imports between developing countries and prosperous countries. Developing countries show dependence on basic food imports, while developed countries tend to depend more on luxury foods. Dependence on basic foodstuffs causes an increase in world food imports and inflation, which in turn hits vulnerable and low-income groups in society¹⁶.

Our philosophy and attitude in life as a nation towards food sources has broad economic and social implications. From the agricultural land to the dining table, it involves a long supply chain, including institutions and human resources, as well as large transportation technology support, and has a direct impact on people's welfare.

¹⁴ Acemoglu, Daron (2017), *Mengapa Negara Gagal*, (Jakarta: Elex Media Computindo), h. xiv.

¹⁵ Nuryati, Leli, Budi Waryanto, dan Roch Widaningsih (2016), *Outlook Komoditas Pertanian Padi*. (Jakarta: Pusat Data dan Sistem Informasi Pertanian), h. 32.

¹⁶ Otero, Gerardo, Gabriela Pechlaner, dan Efe Can Gürcan (2013). "The Political Economy of Food Security and Trade: Uneven and Combined Dependency", *Rural Sociology*, (Volume 78, No. 3). h. 263-289.

Therefore, food sovereignty and self-sufficiency must become the basis for implementing national food. The Law No. 18/2012 concerning Food, provides a clear definition of these two important principles.

2. Food Diversification Policy

Indonesia is known as a country that has a wealth of biological resources, both plants and animals¹⁷. Various types of plants can live well, so it is easy to find plants that have the potential as food, medicine, clothing, and other needs that are beneficial to human life. The diversity of ethnic groups and customs in Indonesia also makes use of biodiversity in various religious ceremonies and rituals.

Types of carbohydrate-producing plants are generally used as staple food. There are many types of carbohydrate-producing plants, such as sweet potato, cassava, taro, kimpul, yam, arrowroot, canna, and others. Most of these tubers have been used by the community, although they have not been managed properly. Apart from tubers, several types of cereals that produce carbohydrates are corn, cantel, and sorghum. In addition to food crops, Indonesia also has 400 types of fruit-producing plants, 370 types of vegetable-producing plants, 70 types of bulbous plants, 60 types of refreshing plants and 55 types of spice plants.

Several types of carbohydrate-producing plants have been used as staple food in other countries. The taro plant is commonly used as a staple food in a number of Asian, Pacific and African countries. In the Philippines and Columbia, taro flour is commonly used as a substitute for wheat in bread making. In Pacific countries, such as Hawaii and others, taro is processed by a fermentation process to produce poi which is an important staple food. Poi is also recommended as baby food and food for sick people because of its advantages in terms of high digestibility. With the abundant potential for diversity of non-rice food crops, this is a great opportunity for the development of local food-based food diversification. Local staple foods have quite a variety of derivative products. These derivative products can be in the form of semi-finished materials such as flour, while the finished product can be ready-to-eat food.

Another consideration of the importance of food diversification policies is distribution efficiency. With rice production centers concentrated on the islands of Java, Sumatra and Sulawesi, the distribution of rice as a staple food requires a lot of money and time. When an island that is not a rice production center experiences a food crisis, it takes a long time to distribute the food. This inefficiency can be overcome by diversification policies based on local food. Commodities cassava and corn are food crops with the highest production volume compared to other commodities. These two commodities have a great opportunity to be further developed into local staple foods. Food security and sovereignty cannot rely on the production of just one food commodity. Foodstuffs that contain carbohydrates are not only sourced from rice, but also from other food ingredients. A number of academic papers show that the basic nutrition of sorghum, corn, wheat and millet is almost the same as rice, thus, it is time for a national food security policy.

Food diversification is an effort to meet food consumption by optimally utilizing local resources and wisdom. This program includes three interrelated scopes of

¹⁷ Sutoyo. 2010. "Keanekaragaman Hayati Indonesia, Suatu Tinjauan: Masalah dan Pemecahannya", *Buana Sains*, (Vol. 10, No. 2). h. 101-106.

understanding, namely: diversification of food consumption, diversification of food availability, and diversification of food production. Through this strategy, it is hoped that the public will be aware and willing to implement it according to their capabilities, so that dependence on imported food products can be reduced. To support food security, diversification of food consumption must also be balanced with diversification of production and diversification of food availability. Efforts to diversify production are carried out by increasing food production with various basic ingredients, for example by producing staple foods made from cassava or cassava (*Manihot utilissima*). Cassava is a plant that has great potential as an alternative staple food besides rice.

Acceleration of food consumption diversification is carried out by both the central government and regional governments, through the following ways: a) Internalization, outreach, promotion and publication of action plans for food diversification; b) Increasing the availability of food based on the potential of local resources of an area by taking into account the environmental balance; c) Increasing the capability and capacity of human resources in the development of food diversification; Community empowerment in the development of food diversification, and d). Monitoring the implementation of food diversification activities in the context of strengthening food security. Efforts to realize food diversification need to be carried out in a sustainable manner through promotion, education, development, as well as production and marketing incentives¹⁸.

3. Epistemology of Ethnobotany and Local Knowledge

The term epistemology comes from the Greek words, namely episteme: knowledge, and logos: speech, thought, or science. The word episteme is a verb, epistamai, which means to place, place, or place. Thus, episteme literally means knowledge as an intellectual effort to place something in its proper position. As a philosophical study that conducts critical and analytical studies of the theoretical foundations of knowledge, epistemology is also called the theory of knowledge (Pranarka, 1987: 3-5)¹⁹. An epistemological study of ethno-botanical studies that includes local knowledge about a variety of local food sources needs to be carried out to examine the extent to which the justification of this study can be considered in policy making. This study is also needed to emphasize that philosophy must dialogue with various fields of science to produce more meaningful and useful knowledge. Exactly as stated by Toeti Heraty Noerhadi (2013) in the introduction to his book, "Based on Philosophy".

Ethnobotanical epistemology aims to examine and find the general characteristics of the knowledge of ethnic communities regarding their knowledge, both collectively and individually.

Through estimology, we want to test the scope or limits of a society's ability to know the variety of plants that can be used to support their lives and to try to provide rational accountability for their claims of truth and objectivity. Accordingly, the assumptions, working methods, or approaches used will also be tested. Obtaining the knowledge needed to survive is a way of being human, knowing is a mode of being. Human society

¹⁸ Dewi, Galuh Prila dan Ari Mulianta Ginting (2012), "Penganekaragaman Pangan dan Perbaikan Gizi Masyarakat", *Jurnal Ekonomi & Kebijakan Publik*, (Vol. 3 No. 1, Juni). h. 65-78.

¹⁹ Pranarka, A.M.W (1987). *Epistemologi Dasar: Suatu Pengantar*, (Jakarta: CSIS). h. 3-5.

is able to acquire, develop, maintain, and pass on knowledge to the next generation, to then develop this knowledge continuously.

In terms of terminology, the study of ethnobotany is the study of the relationship between plants (botany) and community groups (ethnic) in various parts of the world. Meanwhile, ethnicity generally refers to the shared feelings of an ethnic group. An ethnic group can be identified through history in the cultural environment, religious practices carried out, the language used, the customs applied, which are related to sociological characteristics. According to Nugroho (2018), ethnic groups are residents who have unique characteristics that are recognized by other ethnic groups. These unique characteristics are reflected through the following characteristics: a) Able to reproduce and survive biologically; b) Having the same cultural values; c) There is a network of communication and interaction; d) Has the characteristics of its own group. Botany is part of the object of biology and ecology that studies the interaction of organisms with the biotic and abiotic environment. The equivalent of this study, for example, is ethnoecology and ethnomedicine.

Ethnobotanical studies are scientific research that utilizes traditional knowledge to improve the quality of life for humans and their environment. This study emphasizes how to study the relationship between humans and plants and their environment. This study is beneficial for the maintenance of local knowledge through the protection of various types of plants used to support life, both for food, medicine, building materials, traditional and cultural ceremonies, and so on. The results of ethnobotanical studies can be used as documentation and preservation of traditional community knowledge that has used various types of plants. Harberger is known as the first scientist to introduce ethnobotanical studies at an archaeological scientific meeting, in 1895²⁰.

Local knowledge (indigenous knowledge) is indigenous knowledge or local knowledge of traditional values, whether in agriculture, water management, food supply, environmental protection, or health. The system of inheritance of local knowledge is carried out orally, through the expression of words in ceremonies, rituals, customs that are based on practical life²¹. The treasures of local knowledge about the diversity of local food sources can be realized through patterns of utilization of biological resources, traditional agriculture and similar activities. Some of them are meaningful as cultural values, customs and religious traditions. Local communities develop and apply their traditional knowledge practically in their lives²². The development of ethnobotany contributes to the process of identifying natural resources in an area through collecting local wisdom with the community. Ethnobotany can increase public awareness to know scientifically the knowledge they have in supporting their lives, by re-reading the results of studies compiled and practically documented by researchers²³.

²⁰ Suryadarma IGP (2005), "Konsepsi Kosmologi dalam Pengobatan Usada Taru Pramana", *Journal of Tropical Ethnobiology*, (Vol II. No.1. Januari 2005), h. 1-27.

²¹ Klara Dawi, Didi Haryono, Anita Yuliastini, Agustinus Astono, 2022. "Restorative Justice Paradigm of Kanayat'n Dayak Customary Law on Environmental Damage Caused By Shifting Cultivation", *Jurnal Analisis Hukum*, (Vol. 5, No. 2), h. 245-252.

²² Emery, A.R. 1996. *The Participation of Indigenous Peoples and Their Knowledge in Environmental Assessment and Development Planning*, (Ottawa: Centre for Traditional Knowledge), h. 57.

²³ Dewalt, B. 1994. "Using indigenous knowledge to improve agriculture and natural resource management." *Human Organization*, (Vol. 53, No. 2), h. 123-131.

The basic method of ethnobotanical studies is interviews to obtain the required information from a community group. Several interview techniques developed include: a) Planned interviews (standardized interviews); b) Unplanned interviews (unstandardized interviews); and c) Casual interviews. Meanwhile, based on the form of the questions, the interviews were divided into two, namely: closed interviews and open interviews. To obtain the expected data and information, Langill (1999) developed form models that could be adapted to ethnobotanical study interviews, as shown in table 1.

Table 1. Ethnobotanical Study Interview Form Model

Form	Title	Method
QS-1	Description of Village location and land use pattern	Interviews with village heads and farmers
QS-2	Land use cultural background	Interviews with community leaders and farmers
QS-3	Survey on the use of various plants for food	Interviews with farmers and communities
QS-4	Traditional knowledge of land use	Interview with key informants (farmers)
DS-1	Collection and sale of agricultural products	Interview with key informants (farmers)
DS-2	Demographics or population	Household survey and document study
DS-3	Collection of plant data for food ingredients	Group discussion with farmers

Note: QS = Questionnaire Sheet; DS = Datasheet.

Source: Adapted from Langill, Steve (1999), Indigenous Knowledge, Ottawa: IDRC.

Table 1 above is one of the ethnobotanical study instruments to gather information and data related to local community knowledge about plants that can be used as food ingredients. This instrument has an important role because in general local knowledge is not documented, and lives on through oral traditions and the collective memory of the community. The results of entographic studies are useful for documenting local knowledge about the use of plants by certain ethnic groups, including the entire ethnic identity. The discussion of entobotany is not only related to the biological appearance and taxonomy of a plant species, but also includes attitudes, behavior and knowledge of the community towards plant groups in maintaining their culture and ethnicity.

4 Local Knowledge and Food Types

Currently, the global food system has a widespread negative impact on the environment, ecosystem resilience, and biodiversity, which causes economic and social losses for small-scale farmers, including indigenous peoples. Biodiversity degradation and reduced local knowledge regarding traditional societies and ethnobotany have weakened traditional agricultural systems to the point of having a serious impact on food security. The increasingly eroded types and varieties of food crops have also weakened the national agricultural ecosystem. Changes in consumption, production and

distribution patterns are needed to ensure that food is available in sufficient quantity and quality for mankind and its future generations.

For global food security policies, several recommendations from the United Nations (UN), are the need to support the empowerment of the most vulnerable and marginalized food system actors (indigenous peoples), promote regenerative production practices, and support the development of diverse distribution networks. These recommendations are set forth in the form of a report entitled "Food Security and Nutrition: Building a Global Narrative Towards 2030"²⁴. The agricultural revolution changed not only human culture, but also ecosystems. If previously nature played a role in the selection of flora and fauna, in the following year humans began to intervene in the process. Through cultivating plants and breeding certain types of animals, humans select several types that can be developed. For example, the wheat plant (*Triticum* spp) is a type of weed that is successfully cultivated throughout the world. Currently, wheat is known as the main source of human food with a total production of 7.49 tonnes, followed by rice (7.4 million tonnes) (Grote 2021, 1-18).

Nature has been a source of food and human livelihood for centuries. Biodiversity is a natural gift for the Indonesian people. Starting from the variety of flora and fauna, the abundance of micro-organisms, to the diversity of humans and their culture. Indonesia has around three thousand vertebrate species, covering 10 percent of the total vertebrate species in the world. The diversity of higher plants in Indonesia ranks third after Brazil and Colombia.

Referring to data from the Food Security Agency of the Ministry of Agriculture, Indonesia has 77 types of food crops that are sources of carbohydrates, 75 types of sources of oil or fat, 26 types of nuts, 389 types of fruits, 228 types of vegetables, and 110 types of spices and seasonings. In addition, Indonesia is also a center of origin for rice, winged bean, tubers, taro, pomelo, banana, breadfruit, mangosteen, durian, rambutan, salak, langsat, manga, coconut and sago²⁵.

Sources of carbohydrates other than rice can be found in various grain crops, such as barley, sorghum, and barley. In addition, almost all regions have tubers, such as sweet potatoes and taro. The Baliem Valley in Papua is home to no less than 224 sweet potato cultivars, while another 60 cultivars are in Anggi, Papua. LIPI's selection results found 20 taro cultivars that were considered potential as food ingredients. To note, taro is an important germplasm because it is a type of tuber native to Indonesia, which is able to adapt well. From historical studies, it is possible that the first domestication of taro was carried out by the ancestors of the Papuan people, in the Baliem valley, around 6,000 years ago²⁶.

Indonesia is also the owner of the largest sago reserves in the world, one of which is centered in Asmat, Papua. The area of sago plantations in Indonesia reaches 5.2 million hectares, or more than 60 percent of the world's sago reserves. Of this amount, 4.7 hectares of sago land are in Papua and 0.5 million hectares in West Papua. The rest are scattered in Maluku, Riau Islands and Mentawai. Not all of this enormous amount has

²⁴ Clapp, Jennifer (2020), *Food Security and Nutrition: Building A Global Narrative Towards 2030. A Report by The High Level Panel of Experts On Food Security and Nutrition of The Committee on World Food Security*, (Rome: HLPE), h. 5.

²⁵ Widjaja, Elizabeth A., Yayuk Rahayuningsih, Joeni Setijo Rahajoe, Rosichon Ubaidillah, Ibnu Maryanto, Eko Baroto Walujo dan Gono Semiadi (2014), *Kekinian Keanekaragaman Hayati Indonesia*, (Jakarta: LIPI Press), h. 159.

²⁶ *Ibid.*

been utilized, because most of the sago plants in Papua were damaged and died without being able to be harvested²⁷. Indonesia's rich biodiversity has been produced through a long process of geological complexity, geographic position and climate change over thousands of years. Located at the junction of continents and oceans, Indonesia has a very rich supply of biological seeds. The seeds of life that resided in the archipelago then gave birth to a variety of unique endemic species, which are hard to find anywhere in the world.

5 Local Knowledge, Contest of Ideas, and Public Policy

In essence, humans always seek useful knowledge and truth to support their lives. For that purpose, a series of questions are asked, hypotheses are formulated, observations and experiments are carried out to obtain reliable provisional answers. The answer is then tested, both methods, assumptions, and results, until a more advanced answer is obtained. Thus science is developed and built, to organize human knowledge and experience²⁸. From the beginning, Plato (427-347 BC) and Aristotle (384-322 BC) pioneered what is currently known as the correspondence theory of truth, which asserts that statements are true if they correspond to the facts or object being addressed. by this statement. This theory is widely embraced by followers of realism, and developed by Bertrand Russell (1872-1970), and is widely associated with empiricism, positivism, and logical positivism which are the backbone of modern science and the civilization that accompanies it.

The industrial revolution (1760-1830) and the agricultural revolution (1900-1930) were the biological children of modern civilization. If the first-mentioned revolution takes advantage of modern science to increase efficiency and speed up production, and replaces human and animal labor with industrial machines, then what follows is the use of modern science to produce superior seeds, pesticide pesticides, and chemical fertilizers that accelerate growth plant.

Modern science has a high determination to influence public policy, not only because of the support of educational institutions, research institutions, scientific documentation and publications, but also political support and stronger funding. Allocation of funds for the National Research and Innovation Agency (BRIN), in 2022 will reach IDR 6.09 trillion. Of this amount, around IDR 3.03 trillion is for science and technology research and innovation programs, the remaining IDR 3.06 trillion is for management support programs²⁹. With this dominance, it is understandable that the production of knowledge through research results from research institutions and formal education is more easily adopted in the formulation of national policies, including in food sovereignty policies. Although it is often detached from the context and needs of local communities. Meanwhile, local knowledge belonging to indigenous peoples which has been passed down from generation to generation through oral traditions has become marginal.

²⁷ Arif, Ahmad. 2019. Masyarakat Adat dan Kedaulatan Pangan, (Jakarta: Gramedia), h. 38.

²⁸ Rapar, Jan Hendrik. 2002. *Pengantar Filsafat*, (Yogyakarta: Kanisius, Cet. 6), h. 38.

²⁹ Kusnandar, Viva Budy. 2022. Anggaran Belanja Badan Riset dan Inovasi Nasional/BRIN 2022, <https://databoks.katadata.co.id/datapublish/2022/01/14/pemerintah-anggarkan-dana-rp-609-triliun-untuk-brin-pada-2022>, diakses pada 26 Desember 2022. h.

Public policy regarding food has broad implications for society, for this reason it is necessary to provide space for epistemological diversity, so that local knowledge of the community can be accommodated in the contest of ideas. Due to various limitations, local knowledge is not always recognized for its benefits and advantages, including by the local community. The expansion of modern society's thinking systems has also influenced the polarization of people's work, thereby reducing the respect of the younger generation for their traditional knowledge. The acceptance of modern knowledge and culture has led to the dislocation of the local knowledge inheritance system which has resulted in habitat destruction and environmental crises.

In this case, it is the duty of scholars to provide advocacy and take on the role of a voice for the voiceless in the policy formulation cycle³⁰. Production of knowledge is not only the result of academic research and scientific studies, but also reaches out to the oral traditions of local communities, in the form of stories and narratives of folklore that have been passed down from generation to generation. In reality, the formulation cycle is not a simple process. The cycle involves political, social, and economic factors. Although it is rare to find a direct influence of knowledge on policy formulation, it is assumed that the production of scientific knowledge is far more dominant than other types of knowledge.

IV. Conclusion

Pluralism for Indonesia is a necessity. Knowledge and wisdom of various local communities need to be adopted in the formulation of public policies for national food sovereignty. The existence of mainstream knowledge and local knowledge need not negate each other. Through the diversity of epistemology, various kinds of knowledge can complement each other and get adequate space to be developed. Public policies that ignore the diversity of knowledge and aspirations have the potential to deviate from the context and needs of local communities. Indonesia's ethnic diversity and biodiversity are advantages that need to be maintained for sustainable food sovereignty. A good development policy is a policy that considers culture as a valuable capital through the participation of a wider group.

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³⁰ Pawson, R (2006), *Evidence-based policy: A realist perspective*, (London: Sage Publications), h. 75.

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