

Food Diversification as an Effort to Achieve Food Sovereignty at Nusa Tenggara Barat

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Abstract. Indonesia has a variety of local plants that can be used as a source of staple food. Nusa Tenggara Barat (NTB) is one area that has the potential to diversify food by utilizing local food sources. This paper aims to describe the condition of rice consumption in the NTB, the diversity and potential of local food in NTB, explain the efforts that have been made by the community to achieve food diversification and release the dependence of the community on rice plants as a staple food. The method used in this paper is a study of relevant literature and this research uses a quantitative approach method by analyzing data taken from Badan Pusat Statistik (BPS) in 2018-2022. Nusa Tenggara Barat is an area with a variety of staple food sources. However, the inclusion of rice as a staple food source has made local food 'disappear' and now people are returning to being active in making alternative food sources by developing various processed foods from sweet potatoes. Processing sweet potatoes into a variety of foods is believed to be a substitute staple food in NTB. Therefore, food diversification by utilizing local food sources as was done in NTB can be one of the efforts to achieve local and national food sovereignty.

Keywords: dependence, food, food diversification, rice, sweet potato

1 Introduction

Staple foods are foods that contain carbohydrates that are often consumed or have become part of the eating culture of various ethnic groups. Indonesia is a country rich in ethnicity, race, culture, and religion. The same goes for the staple foods you eat. Each province, each tribe or an island has its own staple food depending on the conditions in each area. So that these staple foods are also characteristic of certain regions. In Indonesia, there are a variety of local plants that can be used as sources of staple food including cassava, gembili, kimpul, sago, potatoes, sweet potatoes, jali, breadfruit, bananas, and others [14]. Looking at the history of staple foods, it is interesting to note the fact that Jakob (1980) stated that food is the result of the interaction between humans and their environment. For example, in some areas in Eastern Indonesia, the typical staple food is sago and tubers. Then, in several areas on the island of Java, such as East Java and Banjarnegara, some of the people eat corn as a staple food, which

is processed like rice. Other palms, for example *Eugeissona sp.* used as a food source by the Punan and Ot communities in the hilly areas of Kalimantan, as well as by the Dayak people. Gebang is found throughout the archipelago, used mainly in Madura, Sulawesi, and Nusa Tenggara Timur to eat the cork which contains a lot of starch. Palm stems are used in Java, Riau and West Sumatra, North Sumatra, and the eastern tip of Sulawesi [10].

Talking about food, Indonesia itself has superior food, namely rice as the staple food of its people. In fact, there is an anecdote that says *"You are not full if you haven't eaten rice"* among Indonesian people. Even though Indonesia has abundant natural resources with various natural products, rice remains the staple food of the people to meet their food needs. Therefore, uniformity of staple foods among Indonesians can lead to the loss of local food in various regions.

Efforts to achieve economic improvement are one of the focuses of development in Indonesia. Development that is focused on improving the economy makes the government rely on the agricultural sector so as to make various development programs that support the improvement and development of the agricultural sector. Rice is one of the commodities that is developed and improved so that it is considered a benchmark for people's welfare and becomes a staple food-producing commodity that is highly relied upon by the people of Indonesia. One example of a program, namely the Five-Year Development Plan (Repelita) I – V, is the basis for changing people's consumption of rice and starting to abandon basic commodities other than rice.

In an effort to improve the agricultural sector through the government's Repelita program providing various supporting infrastructure such as irrigation and transportation, counseling on farming methods and disseminating technology to farmers, the government builds fertilizer factories to ensure the availability of fertilizer, and even the government facilitates farmers through bank credit to meet production costs. The government program brought the Indonesian nation to achieve food self-sufficiency through a preliminary strategy for agricultural development [13]. Therefore, the standard of achieving welfare makes Indonesian people very dependent on rice as a staple food commodity.

In addition, Salihah (2020) explained that the decline in biodiversity in agricultural land could be caused by the planting system used by the Indonesian people. The cropping system used by the people of Indonesia still uses a monoculture system, which is a cropping pattern in a land that relies on one type of plant. The existence of a monoculture system can lead to increased pest resistance, ecosystem changes, environmental damage that can lead to a break in the food chain. If the use of monoculture planting systems is continuously carried out, the soil will experience poverty in nutrient content and the soil will become infertile, so that it can cause soil biodiversity to disappear due to erosion that occurs and a decrease in quality due to contamination. In this case, the monoculture cropping system in Indonesia occurs as in rice, where if rice becomes a crop that is too focused on the cultivation system, it can have a negative impact on Indonesian food. If at any time the rice crop is crossed by pests and the rice is contaminated, the stability of the food system in an area will be disturbed. Moreover, rice is a staple food source in Indonesia.

All Indonesian people are familiar with the saying *"it's not said to eat if you haven't eaten rice"*. This indicates that the dependence of the Indonesian people on food in the form of rice

is very high. Nusa Tenggara Barat is an area with a population that also depends on rice for their daily consumption. Nusa Tenggara Barat has the potential for the development of paddy fields covering an area of 239,116 ha and not rice fields covering an area of 44.706 ha with most of them classified as semi-technical irrigated rice fields, simple irrigation and village irrigation and there are also rainfed rice fields [11]. In addition, the Nusa Tenggara Barat region is famous for its tuber commodities which are one of the potential natural resources to release its people's dependence on rice food. One of the strategies in empowering the community in NTB to play a role in food security is to provide processing technology and processed food products made from local raw materials in home industry businesses that are carried out in groups in areas that are sources of local food raw materials. This is an effort of the people of NTB in the form of creating food diversification.

Food diversification can be one solution to achieve the 2nd point of the *Sustainable Development Goals* (SDGs), namely without hunger. The United Nations Development Program (UNDP) stated that the main goals of the SDGs are to end hunger, achieve food security, and develop sustainable agriculture. The first target of this SDGs point is to end the hunger of people in the world by meeting the nutritional needs, safe and sufficient food throughout the year with indicators of the prevalence of malnutrition and the prevalence of moderate or severe food insecurity based on the *Food Insecurity Experience Scale* (FIES). Furthermore, the second target is to end malnutrition by 2030. Food diversification is one of the efforts to encourage people to vary the staple foods they consume so that they do not focus on only one type of staple food. Food diversification is also beneficial for obtaining nutrients from more diverse and balanced nutritional sources. So that with this program it can explore and increase the supply of various food commodities so that there is a diversification of people's food consumption. Food diversification is one of the principles to achieve food sovereignty.

Food diversification efforts that have begun in the Nusa Tenggara Barat region have made the NTB community no longer dependent on rice plants as a staple food. Local staple foods such as tubers are used by local communities to achieve food diversification. Therefore, through this paper, the author aims to explain the conditions related to rice consumption in the Nusa Tenggara Barat region, the diversity of local food and its potential in Nusa Tenggara Barat, as well as to explain the efforts that have been made by the NTB community to achieve food diversification and release the dependence of the community. in rice as a staple food.

2 Literature Review

2.1 Food diversification

Law Number 18 of 2012 concerning Food explains that food diversification or diversification is an effort to increase the availability and consumption of food that is diverse, nutritionally balanced, and based on the potential of local resources. According to Bappenas, food diversification is an effort to increase the consumption of a variety of foods with the principle of balanced nutrition. Food diversification as an effort that is closely related to improving the quality of human resources, agricultural development in the food sector and improving community nutrition, which includes aspects of production, marketing, distribution, and consumption [12]. Basically, food diversification includes three areas of understanding that are interrelated with each other. Food diversification includes three interrelated areas of

understanding, namely diversification of food consumption, diversification of food availability, and diversification of food production [18]. diversification of food consumption has been introduced since the issuance of Presidential Instruction (Inpres) No. 14 of 1974 concerning Improvement of the People's Food Menu (PMMR) which intends to further diversify the types and improve the nutritional quality of people's food, both in quantity and quality as an important effort for national development in order to improve people's welfare, material and spiritual [17].

The policy and strategy of the food diversification program is carried out with the aim of making the public aware that they are willing and according to their abilities, carrying out food diversification activities to reduce dependence on rice and imported food by developing food products derived from local food ingredients. Efforts to accelerate food diversification in the short term can be carried out in several ways, including [19]:

1. Internalization, socialization, promotion, and publication of food diversification action plans,
2. Increasing food availability based on the potential of local resources of a region by taking into account the balance environment,
3. Increasing the capability and capacity of human resources in the development of food diversification.
4. Community empowerment in the development of food diversification, and
5. Monitoring the implementation of food diversification activities in the context of strengthening food security.

Diversification of food consumption is the variety of types of food consumed by the population, including food sources of energy and other nutrients so as to meet the needs of balanced food and nutrients, which are viewed in terms of quality and quantity [19]. Diversification of food consumption must also be balanced with diversification of food production and diversification of food availability. Diversification of food production is carried out by increasing the production of staple foods with more diverse basic ingredients, for example by producing staple foods made from cassava or cassava.

Food security has three main dimensions, namely food availability, accessibility and continuity. Food diversification is closely related to food security because it is the embodiment of the idea that food should be more widely available at a certain point and from time to time, so that it will increase the three dimensions of food security [7].

2.2 Food Sovereignty

Sovereignty is a concept as a form of fulfilling the rights of a citizen to determine their own food production system, either through agriculture, animal husbandry, or fisheries. Food sovereignty is the concept of fulfilling the rights of citizens to food that has quality nutrition, is culturally appropriate, and is produced with a sustainable agricultural system. According to the Indonesian Farmers Union, food sovereignty highly upholds the principle of food diversification in accordance with the existing local culture. Food sovereignty is also the fulfillment of human rights to determine their own agricultural and food systems which emphasize more on family-based agriculture based on the principle of solidarity.

The Indonesian Peasant Union also stated that there are seven main prerequisites for upholding food sovereignty, including:

1. Agrarian Reform;
2. The existence of the right of people's access to food;
3. Sustainable use of natural resources;
4. Food for food and not just a traded commodity;
5. Restrictions on food control by corporations;
6. Prohibit the use of food as a weapon;
7. Providing access to smallholders for the formulation of agricultural policies.

By utilizing local food available, the local community is able to realize food sovereignty as is being done by the people in Nusa Tenggara Barat. Food sovereignty can be positioned as the main strategy to achieve national food development goals, namely food security [20]. By implementing the spirit of food sovereignty, food security in Indonesia will be more able to be achieved in a strong and just manner.

2.3 SDGs 2030: Zero Hunger

SDGs stands for Sustainable Development Goals, where the concept of SDGs was born at a sustainable development conference held by the United Nations in Rio de Janeiro in 2012. The aim of the conference is to obtain universal goals that are able to maintain a balance of three dimensions of sustainable development in Indonesia, including environmental, social and economic. In maintaining the balance of the three dimensions of development, the SDGs have five main foundations, namely people, planet, prosperity, peace, and partnerships that want to achieve three noble goals by 2030 in the form of ending poverty, achieving equality and overcoming climate change. To achieve these three noble goals, seventeen global goals have been formulated, one of which is zero hunger. Zero hunger has a goal in achieving food security, improving nutrition, and encouraging sustainable agricultural cultivation [16]. The target for zero hunger is to end hunger and all forms of malnutrition and ensure universal access to sufficient nutritious food throughout the year.

3 Methods

The method used in this paper is a literature study, namely by researching and understanding books, documents or other written sources that are relevant and support related ideas or ideas. The literature study method is a series of activities related to the methods of collecting library data, reading and taking notes, and processing research materials [23].

Our literature study data was taken from various journals from 2004 until the year 2021 on food sovereignty in Nusa Tenggara Barat. In addition, we took data from the Badan Pusat Statistik (BPS) for 2018-2022 related to food sovereignty in Nusa Tenggara Barat. Based on this, the type of data used is secondary data and data collection in research is carried out by reviewing and/or exploring some data, then summarizing and then analyzing and synthesizing and making conclusions from the data obtained.

4 Results and Discussion

4.1 Patterns of Staple Food Consumption

Apart from rice, commodities that are staple food, especially in Indonesia, are tubers, corn, sago and bananas. This variety of staple food patterns has actually been around for a long time, such as sago being consumed by people in Papua and Maluku, and corn being consumed by most people in NTT. However, due to too dominant and intensive government policies in the field of sustainable rice production, starting from the upstream to downstream industries, this has resulted in a shift in staple food from local foods such as corn and tubers to the national staple food, namely rice [5].

The results of the analysis with Susenas data 1979 (Center for Agro-Economic Research, 1989) and 1996 (Rachman, 2001 in Ariani, 2010) in the Eastern Region of Indonesia (KTI) show that: 1) all provinces in Indonesia in 1979 had the main staple food pattern rice. In 1996, the position was still the same, even if it changed it would only occur in the second food, namely corn and tubers; 2) the single pattern of rice in 1979 only occurred in one province, namely South Kalimantan and in 1996 it occurred in 8 provinces, namely South Kalimantan, West Kalimantan, Central Kalimantan, East Kalimantan, NTB, South Sulawesi, North Sulawesi and Central Sulawesi [5]. Thereby shifting the role of maize and tubers.

Processed from the 2002, 2005 and 2008 Susenas data, it is increasingly clear that the consumption pattern of staple food in Indonesia has shifted from a diverse pattern to a single pattern, namely rice. Table 2 shows that the single consumption pattern of rice occurs at all income levels, from the poor to the rich. The dominance of rice as the main staple food pattern continues in every province and cannot be replaced by other types of staple food. Changes in the type of staple food only occur in non-rice commodities, such as between corn and tubers and vice versa.

Table 1. Staple Food Consumption Patterns in Indonesia by Expenditure Group, Indonesia

Expenditure Group (Rp)	2002	2005	2008
<60.000	B, J, UK	B, T	-
60.000-79.999	B, J, UK, T	B, T	-
80.000-99.999	B, T, UK	B, T	-
100.000-149.999	B, T	B, T	B, T, J
150.000-199.000	B, T	B, T	B, T
200.000-299.999	B, T	B, T	B, T
300.000-499.000	B, T	B, T	B, T
500.000-749.999	B, T	B, T	B, T
750.000-999.999	B, T	B, T	B, T
>1.000.000	B, T	B, T	B, T

Note : B = Rice, T = Wheat (including its products), J = Corn, UK = Cassava,
Source : [5]

Based on a report from the Central Statistics Agency (BPS) shows, national rice consumption reached 28.69 million tons in 2019 with the largest contributor in the household sector which contributed 72% of the total national rice consumption of 20.68 million tons. The highest household consumption of rice was in West Java at 3.85 million tons. Then, East Java and Central Java followed with 2.88 million tons and 2.33 million tons, respectively (Annur, 2021). According to BPS data (2019), NTB is one of three provinces in Indonesia that has a high level of rice consumption, namely in 2017 as much as 122.64 kg/capita/year and in 2019 it decreased to 96.88 kg/capita/year. .

The high consumption of rice indicates that food diversification in NTB is still relatively low. It is unfortunate that based on the Indonesian Peasant Union, food diversification in accordance with the existing local culture is a principle upheld by the concept of food sovereignty. Therefore, the community needs to be empowered to develop local food that is varied, practical, high-tasting, nutritious, and prestigious in accordance with the concept of food sovereignty, namely the fulfillment of citizens' rights to food that has quality nutrition, is culturally appropriate, and produced with a sustainable farming system.

Nusa Tenggara Barat (NTB) is one of the provinces in Indonesia that has abundant agricultural potential. In food crop agriculture, NTB is known as one of the producers of rice and corn with good quality, while in plantation agriculture NTB is known as a producer of sweet potatoes, coffee, tobacco, and fruits [8]. This is a separate opportunity for NTB to be able to take advantage of abundant non-rice agricultural products into staple food based on local

potential. One of the potential non-rice agricultural products that can be developed is sweet potato. Based on data from the NTB Satu Data (2021) page, sweet potato productivity in NTB in 2001-2020 tends to increase every year. In 2001 the productivity of sweet potatoes in NTB was 2,678 quintals per hectare, then in 2010 it increased to 3,198 quintals per hectare, and in 2020 it was 3,401 quintals per hectare. The increase in sweet potato production must also be accompanied by an increase in community skills in processing sweet potatoes so that they can be of more economic value and become a potential local food that can substitute for rice as a staple food.

4.2 The Potential of Food Diversity in Nusa Tenggara Barat

Nusa Tenggara is one of the provinces in Indonesia that has a variety of food. The food diversity in NTB can be seen from the following table.

Table 2. Total Production of Food Crops in West Nusa Tenggara

Type of plant	Production (ton)				
	2007	2008	2009	2010	2011
Rice	1.526.347	1.750.677	1.870.775	1.774.449	2.067.137
Corn	120.612	196.263	308.863	249.005	456.915
Soya bean	68.419	95.106	95.846	93.122	88.100
Peanuts	32.913	32.348	38.615	33.666	37.331
Cassava	88.527	68.386	85.062	70.606	75.366
Sweet potato	13.006	10.985	11.276	13.134	11.970
Mung beans	40.970	39.756	33.774	50.012	50.702

Source: Department of Agriculture, Food Crops and Horticulture NTB, 2012

From the table, it can be seen that rice occupies the first position with the highest number of food crop production from year to year in NTB. Then followed by corn and other root crops. An increase in the amount of rice production from year to year is always followed by an increase in consumption. This is different from other food crops such as tubers, where the production of tubers in the province of NTB tends to increase from year to year but is not followed by an increase in consumption. One of them is cassava, where cassava is the tuber with the highest consumption among other tubers, which is 25.6 g/cap/day (79.7%), while sweet potato is only 2.1 g/day. cap/day (6.6%) [9]. Therefore, sweet potato consumption needs

to be increased as a food ingredient to increase the consumption value of sweet potato whose nutritional value is not inferior to other types of tubers [11].

In 100 grams of sweet potato contains various nutrients that are needed by the body such as: (1) calories 123 cal, (2) protein 1.8 grams, (3) fat 0.7 grams, (4) carbohydrates 27.9 grams, (5) minerals 1.1 grams, (6) potassium 49 mg, (7) vitamin A 7700 SI and vitamin C 22 grams. Besides that, it also contains antioxidants that can prevent the formation of free radical cells (cancer) and beta-carotene, substances that are needed for eye health, and are able to reduce levels of SGOT and SGPT which are indicators of eye health. lipid peroxidation [9].

One form of application of the potential of sweet potatoes in NTB is the existence of members of women's farmer groups who carry out food processing businesses using sweet potato raw materials. They admit that sweet potatoes are easy to obtain and the price tends to be cheaper than wheat flour or rice flour which has been commonly used as raw material for processed foods such as market snacks. Based on a survey conducted by [9], members of the women's farmer group also tend to prefer using sweet potato instead of rice flour as raw material for processed food because by using sweet potato as raw material, the processed food produced is considered more attractive and attractive. has a distinctive taste. In addition, the shelf life of processed food which is dominated by sweet potato raw material has the same value as processed food which is dominated by rice flour, so that it can further strengthen the existence of food diversification in NTB by utilizing the available food potential.

In addition, Faresta *et al.* (2021) explained that there is one village in NTB, namely Mamben Baru Village, Wanasaba District which has an abundant number of plantation commodities, one of which is cassava. When the harvest season arrives, farmers produce abundant cassava commodities. However, the harvest season caused the prices of these commodities to tend to decline. The decline in commodity prices was not only caused by the abundance of production but also because the products marketed by farmers were raw products, thus contributing to the low price of cassava. In overcoming this, it is necessary to increase the added value of cassava, one of which is by making cassava as a processed product.

If it is seen from the need to increase the added value of cassava by turning it into a processed product, it can be interpreted that the potential of cassava in Mamben Village is still not much in demand by the people there and there is still a lack of innovation or ideas in terms of utilizing the existing potential of cassava so that there is food diversification. through cassava also needs to be developed to be able to maximize the potential of available food.

The two types of sweet potatoes, namely sweet potatoes and cassava, need to be developed into a diversification program so that the community is not only able to maximize the potential of available food but also to fulfill food sovereignty, namely the right to food through local food products so that people are able to obtain good nutritional quality independently.

4.3 Food Diversification as an Effort to Achieve Food Sovereignty in Nusa Tenggara Barat

Food diversification is an effort to create food sovereignty by utilizing local food. The dependence of the Indonesian people on rice food is one of the common tasks to be completed in order to avoid the food crisis. One of the regions in Indonesia that has started to make efforts to diversify food to reduce the dependence of its people on rice food is in Nusa Tenggara Barat. This effort made by the community in Nusa Tenggara Barat received assistance from the local government to create food sovereignty and achieve the goal of food self-sufficiency in Nusa Tenggara Barat.

The amount of rice consumption of the people of Nusa Tenggara Barat shows that food diversification in Nusa Tenggara Barat is still low. Changing the people's diet from rice to a variety of other foods such as corn, sweet potatoes, cassava and cassava is still difficult due to various factors [9]. With such a situation, the government needs to work together with the community to be able to develop local food with the aim of achieving national food security and sovereignty in Nusa Tenggara Barat. The information dissemination and socialization program is one of the openings for the community to gain an understanding that utilizing local food can realize food diversification in Nusa Tenggara Barat so that people do not depend on rice food to meet their basic needs.

According to Fitrahtunnisa *et al.* (2010), one of the strategies in empowering the community to play a role in food security is to provide processing technology and processed food products made from local raw materials in home industry businesses that are carried out in groups in areas that are sources of local food raw materials. The development of increasingly widespread technology will facilitate the achievement of food diversification in Nusa Tenggara Barat through increasing the diversity of processed products from local food in Nusa Tenggara Barat. One of the food sources used by the people of Nusa Tenggara Barat to develop a processing business using advanced technology is sweet potatoes obtained from markets or stalls around their homes.

Sweet potatoes are processed into other foods such as sweet potato cupcakes, sweet potato sticks, sweet potato dumplings, sweet potato elephant ears, steamed sweet potato rolls and sweet potato carang. Processing sweet potatoes into a variety of foods is believed to be a substitute for staple food for the people of Nusa Tenggara Barat because they no longer depend on wheat flour to process various types of cakes. In addition, processing sweet potatoes can provide more benefits for the KWT group because it has great marketing opportunities and is in great demand as souvenirs for immigrants. Thus, this recognition can release the dependence of the community on the use of wheat flour and can increase the diversity of food in the community.

Food diversification efforts carried out by the people of Nusa Tenggara Barat are able to create food sovereignty by utilizing local food crops and not only relying on rice as a staple food. Food sovereignty is one of the keys to releasing people from the shackles of poverty. Based on data from the Badan Pusat Statistik (BPS), the number of poor people in Nusa Tenggara Barat from 2018, 2020 and 2021 has decreased. In 2018, the number of poor people in Nusa Tenggara Barat reached 14.63%, in 2020 the number of poor people in NTB reached 14.23%,

and the number of poor people in Nusa Tenggara Barat in 2021 reached 13.83%. This shows that the efforts made by the people of Nusa Tenggara Barat to develop local food as a form of food diversification can release the community from poverty.

5 Conclusion

Food diversification is a development program that is being developed by the Indonesian government and aims to release dependence on rice as a staple food. The consumption pattern of staple food in Indonesia has shifted from a diverse pattern to a single pattern, namely rice. One of Indonesia's regions, namely Nusa Tenggara Barat, which has a variety of local foods, has started a food diversification program. With the potential and diversity of food in Nusa Tenggara Barat, one of which is tubers, which are the main focus of the people of Nusa Tenggara Barat, eliminating dependence on rice as a staple food. Food diversification efforts carried out in Nusa Tenggara Barat began with awareness from the local government to make people aware of the use of local food.

Through the development of technology and science, the people of Nusa Tenggara Barat process tubers into other foods such as sweet potato cupcakes, sweet potato sticks, sweet potato dumplings, sweet potato elephant ears, steamed sweet potato rolls, and sweet potato carang and are trusted can be a substitute for staple food for the people of Nusa Tenggara Barat. Food diversification efforts carried out by the people of Nusa Tenggara Barat are able to create food sovereignty by utilizing local food crops that do not only depend on rice as a staple food. Utilizing local food as a form of food diversification creates food sovereignty for the people of Nusa Tenggara Barat which is able to free the community from poverty.

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