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A POLICY CONSTRUCTION FOR SUSTAINABLE RICE FOOD SOVEREIGNTY IN INDONESIA

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ABSTRACT

As an agricultural country with large natural resources, Indonesia still has considerable problems in managing food security. This is evidenced by the lack of agricultural land and human resources that can support people's food needs so that the government still imports food from other countries. These issues as; it are feared that population growth and high food consumption power, social exclusion (marginalization of agricultural laborers and agricultural land) will cause food security vulnerability in the future. This Mixed method quantitative and qualitative method by statistical and in-depth interview study involving 169 respondents from many stakeholders such as politicians, academicians, farmers, and students to determine policy construction for sustainable rice food sovereignty in Indonesia. The statistical study shows the rice consumption in Indonesia is correlated to education than the age and gender of the respondents. The study indicating problems such as; the welfare of farmers, the application of price limits for staple goods, and improving the quality of agriculture both natural resources, human resources, and the provision of agricultural equipment assistance have not been resolved properly. To build food security, it should be balanced with the application of the concept of food sovereignty which is realized by aligning and maximizing competence between political resources, environmental resources capacity, and environmental diplomacy.

Keywords: food security; food sovereignty; political resources; environmental resources; environmental diplomacy

INTRODUCTION

Indonesia is an archipelagic country that stretches widely and has quite extensive agricultural land. Indonesia is also located in a tropical area with a climate suitable for extensive agricultural business so that Indonesia is an agricultural country. The majority of Indonesian people's staple food is rice **(Davidson, 2018; Maraseni et al., 2018; Purba et al., 2020)**. However, in reality, Indonesia does not has rice food sovereignty yet **(Davidson, 2018)**. This is the reason why Indonesia still imports rice **(Warr, 2005)**. The theoretical perspective and the results of previous research that the author has done show that there is no concept or model or theory on the relevant sustainable rice food sovereignty policy implemented in Asia **(Sharma and Daugbjerg, 2020)** or even in Indonesia itself **(Davidson, 2018)**. Therefore, this study focuses on how to construct a model for sustainable rice food sovereignty in Indonesia.

From the data of the United Nations (UN), 80% of the world's population who suffer from hunger live in rural areas and of the 1 billion people who suffer from poverty in the world, 75% live and work in rural villages **(Yeboah-Assiamah et al., 2015)**. Likewise, Indonesia was also affected by the global food crisis in 2007 – 2008 **(Hossain, 2018)**. The food crisis has led to an understanding in the world community that "agriculture must be the main agenda in economic development **(Deichmann et al., 2011)**. Agriculture should be the main agenda in development planning because it is related to fulfilling national food security **(Kotykova, Babych a Krylova, 2020; Neilson and Wright, 2017)**. Fulfillment of national food needs has always increased due to growth in food consumption **(Szűcs, Szabó and Bánáti, 2013)** and population growth. In talking about rice, it will always be a complex situation in a strategic position in the process of agricultural development in Indonesia. Rice has become a political commodity and controls the life of the Indonesian people. The community has made rice a staple food so that it has become a strategic economic sector for the economy and national food security.

The Indonesian Central Statistics Agency (BPS) (Figure 1) shows that the macro indicators of the Indonesian agricultural sector, especially rice production in 2015, reached 75.3 million tons, while the rice production target was 82 million tons in 2017. Even though it has increased by about 1.5% compared to 2014 production, the target for this increase is not easy. Rice production in 2016, according to the estimated figures of BPS and the Ministry of Agriculture, reached 79.1 million tons of milled dry unhulled rice (GKG). This figure is up 4.97% compared to the 2015 production which reached 75.3 million tons of GKG. If the production data is correct, there should be a rice surplus of tens of millions of tons in 2017.

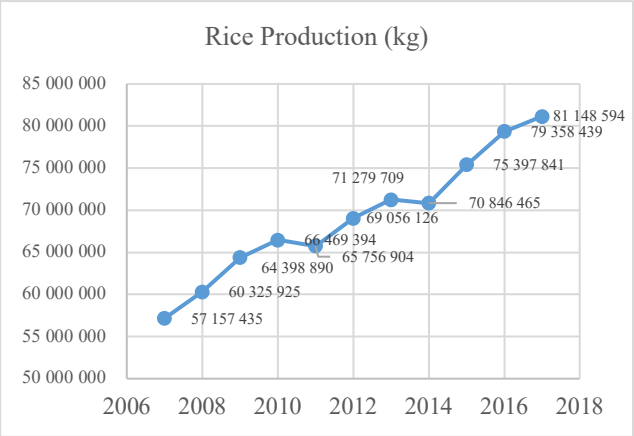

Figure 1 Rice Production in Indonesia

Apart from the potential for exports, the stock surplus should push down prices. However, in reality, there was a rice shortage of 5.8 million tons in 2015 and is predicted to increase to 7.49 million tons of rice by 2020. To produce this amount of rice, a harvest area of around 13,500 – 15,000 ha of rice fields is needed or an area of around 9,000 paddy fields. - 10,000 ha **(Nugroho et al., 2018)**.

Indonesia is very dependent on carbohydrate food sources such as rice and wheat/wheat flour **(Davidson, 2018)**. This condition is evidenced by the continuous import of rice **(Patunru, 2019; Warr, 2005)** carbohydrates that exceeds the quota set by the government, which is more than 62%. The country's dependence on rice food is a reflection of the people's food consumption pattern (food habits) which tends to rice, even though non-rice food sources are still abundant, such as sweet potatoes, corn, sago, soybean, and other tubers. In response to such conditions, the government is trying to encourage food diversification to reduce the burden of carbohydrate consumption on other food commodities that are cheaper and more affordable.

The government's role in agricultural development towards strengthening food security is quite a lot. Various policies and programs in the agricultural sector have been implemented to increase agricultural production, such as the use of superior seeds, provision of fertilizers and medicines to agricultural land processing. The Ministry of Agriculture (KEMTAN) of the Republic of Indonesia has realized the expenditure budget for the period 2013 – 2017 from 17.8 trillion to IDR 23.9 trillion for the 2017 State Budget, although there was a decrease compared to the 2016 State Budget for the Ministry of Agriculture of the Republic of Indonesia amounting to IDR 31.5 trillion. Increasing the portion of the Ministry of Agriculture's budget allocation for the Republic of Indonesia during the 2013 – 2017 period is still related to the efforts in improving people's welfare, namely in the form of job creation, especially in rural areas, and economic growth and realizing national food security. The level of food availability is at least 90% of domestic needs. This is to secure food self-sufficiency, even though the most basic agricultural problems are the availability of land and agricultural infrastructure. On the agricultural infrastructure side, most of the irrigation networks are in poor condition. In 2017, the budget allocation for water resources management reached Rp. 6.3 trillion, while the program for the provision and development of agricultural facilities and infrastructure was IDR 2.7 trillion. Although the irrigation network has continued to increase from 2010 – 2017, according to **(Sugiyanto, Djumadin and Digdowiseiso, 2018)** there are still around 52% of the irrigation network was damaged. This condition can reduce the capacity of the agricultural sector to increase production yields, in addition to the availability of land, farming infrastructure which is also an important issue for increasing agricultural productivity. Food sovereignty should give freedom to farmers as producers to make choices independently and without coercion in developing food security and independence by the capacity and potential of local agricultural resources so that farmers can increase their production and welfare. The role of the government is needed as a regulator and facilitator in the agricultural sector through various policy instruments, regulations, and food programs that support these efforts for food sovereignty. For food commodities with political content such as rice, the government needs market intervention at or before the main harvest season. The government sets a base price for rice at the lowest price level to improve farmers' welfare. Meanwhile, during the planting season, the government sets an upper price to protect consumers, including farmers. This government policy can later have a significant influence on the direction and activities of Indonesia's food program.

Scientific Hypotheses

The hypotheses are measured based on the literature review from several researchers, in the quantitative method **(Worsley et al., 2004)**, the measurement will measure people in Indonesia demographic conditions of gender, age, and education, the relations between three parameters with Rice Consumptions, the Hypotheses-0 (H_0) in this research is gender, age and education have a significant relation to rice consumptions and the Hypotheses-1 (H_1) in this research is gender, age and education do not have a significant relation to rice consumptions. The significance level is 0.05%, or in another word, the value of asymptotic significance <0.05% means the significant relationship is indicated between two parameters, and if the asymptotic significance <0.05% the relationship is not significantly indicated between two parameters. The other hypotheses in this research are, food sovereignty policy in Indonesia is supported by environmental management, stakeholder, the capacity of environmental resources, environment ecology, and policy foundation.

MATERIAL AND METHODOLOGY

Samples

However, this research is a mixed-method Qualitative and Quantitative based research **(Hashmi and Carlson, 2012; Schoonenboom and Johnson, 2017)**, specific samples are assigned by a purposive sampling method **(Serra, Psarra and O'Brien, 2018)**. To determine the food security model as modeled by **(Shoaib et al., 2021)**, samples are targeted to the person who aware of this matter. This study aims to sample academicians, politicians, food resilience experts, and students. Questions in this research are using structured interviews and questionnaires to explore the food security model, a total of 169 samples are targeted in this research.

Table 1 Demographics of Respondents (Gender).

	Freq	Valid %	Cumulative %
Male	75	44.4	44.4
Female	94	55.6	100.0
Total	169	100.0	

Table 2 Demographics of Respondents (Age).

	Freq	Valid %	Cumulative %
15 – 29	101	59.8	59.8
30 – 39	54	32.0	91.7
40 – 49	7	4.1	95.9
50 and above	7	4.1	100.0
Total	169	100.0	

Table 3 Demographics of Respondents (Education).

	Freq	Valid %	Cumulative %
High-School/ Middle-School	53	0031.4	31.4
College Degree	99	58.6	89.9
Postgraduate Degree	17	10.1	100.0
Total	169	100.0	

Table 4 Gender and Rice Consumption.

Count		Rice Consumption		Total
		Yes	No	
GENDER	Male	70	5	75
	Female	90	4	94
Total		160	9	169

Aimed for policy construction for food security sovereignty, a mix method research with an exploration of relations between respondents demographic and rice consumptions (quantitative method) to its view to food sovereignty and also qualitative method as suggested by several researchers such as **(Bush-Kaufman et al., 2019; Katikireddi, Bond and Hilton, 2014)** who explore strategies. To measure the significance of the relation. IBM SPSS Statistics 22.0 is used to measure the *Chi-Square* value between two parameters. To support the research, more method is suggested by using Qualitative research method by providing an in-depth interview to its policy understanding and can understandable by its respondents. Questions related to staple foods, food locations, food substitutions, etc. In this research, statistical tests were two-sided, and significance was assessed at the a = 0.05 level. Statistical analyses were performed in R **(Gossai et al., 2017)**.

As we can see in Table 1, from the total of 169 respondents 55.56% of the respondents are females and 44.4% are males.

Table 2 below, from a total of 169 respondents more respondents (59.8%) are aged 15 – 29 years old (yo) and 32% are 30 – 39 yo and the rest of them are up to 40 years old.

The demographic table (Table 3) also shows more educated respondents in this research, while 58.6% of the respondents are graduated from college, and the smaller portion (31.4%) are graduated from high school. A very small portion (10.1%) are graduated from postgraduate school.

With better education, it is assumed the respondents will have a better understanding of this topic to answer the research questions.

RESULT AND DISCUSSIONS

The Food Sovereignty Policy Model is raised by several researchers **(Beuchelt and Virchow, 2012; Shilomboleni, 2017)**, especially in food sufficiency to the Asian society such as rice. Refers to the basic principles of environmental science, namely sustainability **(Helms, 2004)**.

Sustainability itself means that there is a process of natural life systems in which humans and other living things carry out their life and the welfare of humans and other living things **(Scerri, 2010)**. This scope in which there are humans and living things is limited by factors that are accessible to humans, for example, natural, political, economic, and social factors **(Yu and Wu, 2018)**. Also, the use of natural resources to drive economic growth **(Ji, Magnus and Wang, 2014)** is carried out without sacrificing the carrying capacity, supporting capacity, and environmental productivity **(Yang et al., 2016)**.

Sustainable development in the field of food sovereignty **(Katikireddi, Bond and Hilton, 2014)** consists of the social environment, the artificial environment, and the natural environment in which the three subsystems interact **(Rahmann et al., 2020)**. The resilience of each subsystem will improve a balanced and dynamic condition and this condition can assure sustainability which in turn will increase the quality of food production **(Bosona and Gebresenbet, 2018)**.

Based on the results of distributing questionnaires to 169 respondents, the authors see various conditions related to conditions and future expectations for developing a food sovereignty policy model. This food sovereignty policy model will later be a novelty combined with the theories used in research. A total of 169 respondents were drawn from distributing questionnaires.

Relations between Gender and Rice Consumption

Several researchers such as: **(Kunto and Bras, 2018; Wennberg et al., 2012)** placed Gender as an important role in food consumption. From these results, it can be seen that people in Indonesia still depend on rice as their daily staple food **(Surahman, Soni and Shivakoti, 2018)**. The amount of agricultural land that has existed in Indonesia until now and in the future is decreasing. This is due to massive development in terms of industry, offices, and housing, which has resulted in the erosion of agricultural land in Indonesia **(Schreer and Padmanabhan, 2020)**. The erosion of agricultural land has resulted in Indonesia importing rice from neighboring countries, such as Vietnam, Thailand, China, India, Pakistan, the United States, Taiwan, Singapore, Myanmar, and other countries **(Yuniarti, 2010)**. As we can see from Table 4 and Table 5, both males and females are consuming rice for their main meals (Table 4 and Table 5).

Based on the data of the respondents the value or asymptotic significance count >0.05% means the less significant relationship is indicated between two parameters (gender and rice consumption).

Staple food other than rice should be a lot **(Gao et al., 2019)**. The food starting from sago, cassava, bread, potatoes, corn, and yams **(Utami, Cramer and Rosenberger, 2018)**. However, Indonesian people, in general, are familiar with the term "if you haven't eaten rice, it's a sign that you haven't eaten yet". This term has continued until recently. So that the current trend in the future is that the Indonesian people are in an emergency for rice food. This is inversely proportional to the current agricultural conditions in Indonesia. Until now, the land has been increasingly eroded by industrial development like happens in India **(Balakrishnan and Lalithambika Devi, 1984)**, both small and large scale, as well as the massive development of exploration for mines or other natural resources. Also, other developments are for housing or office infrastructure.

Relations between Age and Rice Consumption

From previous research **(Chanpiwat and Kim, 2019)**, it is not suggested for unproductive age to consume rice (40 years old and up) since rice mostly contain high carbohydrate (50 g per 180 g serving size) **(Haimoto et al., 2018)**, most of those ages statistically prone to diabetes disease. Age is playing an important role in rice consumption, as we can see from Table 6 and Table 7, the theories are not supported, even more people of older age still consuming rice as their main food source (Table 6 and Table 7).

This figure has an indirect impact made the rice import figures for the public get higher and higher. There is a paradox based on the results of distributing questionnaires given to 169 respondents. Most of the respondents consume the staple rice in their daily lives, at least 2 times meals per day. However, the respondents answered that there was no need to import rice for the Indonesian people. This is a finding that when the community's staple food is rice, there has been no concrete action yet on how to sustain the rice food in Indonesia.

In terms of age based on the data of the respondents, the value of asymptotic significance count >0.05% means the less significant relationship is indicated between two parameters (age and rice consumption).

Relations between Education and Rice Consumption

In terms of Education based on the data of the respondents the value or asymptotic significance count <0.05% means both parameters have a significant relationship (Table 8 and Table 9) (education and rice consumption) **(Di Leo and Sardanelli, 2020)**.

The data measurement is answering the hypotheses. Indonesia demographic conditions of gender, age, and education, the relations between three parameters with rice consumptions, the hypotheses-0 (H_0) in this research is gender, age and education have a significant relation to rice consumptions. Based on the measurement, only gender and age can accept this hypothesis, and the relations between education and rice consumption have significant relations, the result of asymptotic significance is 0.035 or count <0.05% means both parameters have a significant relationship. This result means rejecting hypotheses-1 (H_1) in this research is gender, age and education do not have a significant relation to rice consumptions. This research is supported by the previous researcher **(Utami, Cramer and Rosenberger, 2018; Worsley et al., 2004)**, who investigate a relationship between education and rice consumption.

Policy Construction to Rice Sovereignty

Rice imports, which have been carried out by the Government of the Republic of Indonesia, are carried out to maintain the stability of food availability for the community. However, the rice import policy must be in the last order to be implemented. The entry of rice imports in the last sequence is considered to maximize the potential that exists in the country.

Table 5 Gender and Rice Consumption Chi-Square measurement.

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.481[a]	1	.88		
Continuity Correction[b]	.122	1	.727		
Likelihood Ratio	.477	1	.490		
Fisher's Exact Test				.512	.361
Linear-by-Linear Association	.478	1	.489		
N of Valid Cases	169				

Table 6 Age and Rice Consumption.

		Rice Consumption		
		Yes	No	Total
AGE	15 – 29	94	7	101
	30 – 39	52	2	54
	40 – 49	7	0	7
	50 and above	7	0	7
Total		160	9	169

Table 7 Age and Rice Consumption Chi-Square measurement.

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.585[a]	3	.663
Likelihood Ratio	2.320	3	.509
Linear-by-Linear Association	1.508	1	.219
N of Valid Cases	169		

It can be seen from the results of the questionnaire respondents that most people still buy rice from markets or traditional markets.

This is evidenced by the increase in rice imports from year to year. The government through the Ministry of Trade (Kemendag), in 2018, imported 500,000 tons of rice from Vietnam and Thailand. This rice import was carried out due to the addition of rice stocks which had decreased over time. The government thinks that with a population of more than 250 million people, rice is needed as a staple food for Indonesians.

Besides, based on data from the Central Statistics Agency (BPS), Indonesia has always imported rice from 2000 to 2015, or for fifteen years. For 2016 and 2017, the government has temporarily stopped importing rice. In 2018, Indonesia again imported rice. So that during this period, Indonesia has imported rice as much as 15.39 million tons of rice with the largest volume of rice imports in 2011 with a volume of 2.75 tons. Meanwhile, the smallest volume in 2005 was 189,616 tons. In terms of funds spent on rice imports amounting to 15.39 million tons, reaching the US $5.83 Billion or converted into rupiah amounting to IDR 78.70 trillion (exchange rate of IDR 13,500).

Based on the results of respondents in the interview, for the location of buying rice, most people still depend on traditional markets, even though people also buy their rice food needs at mini-markets/supermarkets/malls. It occupies the last position if people buy directly from farmers or bring rice from their hometowns. Even though it ranks last in terms of purchasing rice, this is a potential that people are still trying to be able to buy rice food from domestic products.

Based on Table 10. This shows that Indonesian people do not need to import rice. This is because the potential that exists in the domestic community still can produce food in the form of rice. Besides, the public thinks that importing rice, has the potential to increase the amount of foreign debt held by the state.

Table 11 shows that rice consumption per week and family is around 66.036 kilograms. So it can be seen that the dependence on consuming rice for Indonesian people is still very high based on this figure.

Table 8 Education and Rice Consumption.

		Rice Consumption		Total
		Yes	No	
Edu	High-School/Middle-School	53	0	53
	College Degree	90	9	99
	Postgraduate Degree	17	0	17
Total		160	9	169

Table 9 Education and Rice Consumption Chi-Square measurement.

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	6.722[a]	2	.035
Likelihood Ratio	9.982	2	.007
Linear-by-Linear Association	1.163	1	.281
N of Valid Cases	169		

Table 10 Urgency of Importing rice.

		Freq	Valid %	Cumulative %
Valid	Needed	25	14.8	14.8
	Not-Needed	144	85.2	100.0
	Total	169	100.0	

Table 11 Respondents' Rice Weekly Consumption.

	N	Min	Max	Mean
Weekly consumption	169	1.00	125.00	66.036
Valid N (listwise)	169			

Table 12 Price of Rice according to Respondents.

		Freq	Valid %	Cumulative %
Valid	Very Cheap	21	12.4	12.4
	Cheap	22	13.0	25.4
	Average	42	24.9	50.3
	Expensive	78	46.2	96.4
	Very Expensive	6	3.6	100.0
	Total	169	100.0	

The community's dependence on rice is not comparable to the community's ability to buy rice.

The increasing number of rice imports based on BPS data every year shows that Indonesia, with a population of more than 250 million, still depends on the availability of rice food. There need to be more contributions to overcome the problems that exist today to achieve food security **(Timmer, 2014)** for the people of Indonesia. In addition to the need related to the existence of rice food, the author tries to explore most of the people shopping for their rice food needs anywhere.

This can be seen in Table 12 that the price of rice according to respondents is still expensive. The high price of rice has made the health and economic conditions of the people deteriorate over time.

Based on Table 13, it is stated that as many as 76 respondents said they wanted to replace their staple food like rice. And almost as many as the previous respondents, as many as 93 respondents did not want to replace the staple food rice. This can be assumed that the Indonesian people still cannot replace their staple food, namely, rice, because since childhood and from a long time ago, people have been accustomed to consuming rice.

Table 13 Substitute Rice according to Respondents.

		Frequency	Valid %	Cumulative %
Valid	Needed	76	45.0	45.0
	Not-Needed	93	55.0	100.0
	Total	169	100.0	

Table 14 The main food consumed other than rice according to the respondent.

		Frequency	Valid %	Cumulative %
Valid	Wheat	2	1.2	1.2
	Cassava	100	59.2	60.4
	Kentang	13	7.7	68.0
	Sago	18	10.7	78.7
	Others	36	21.3	100.0
	Total	169	100.0	

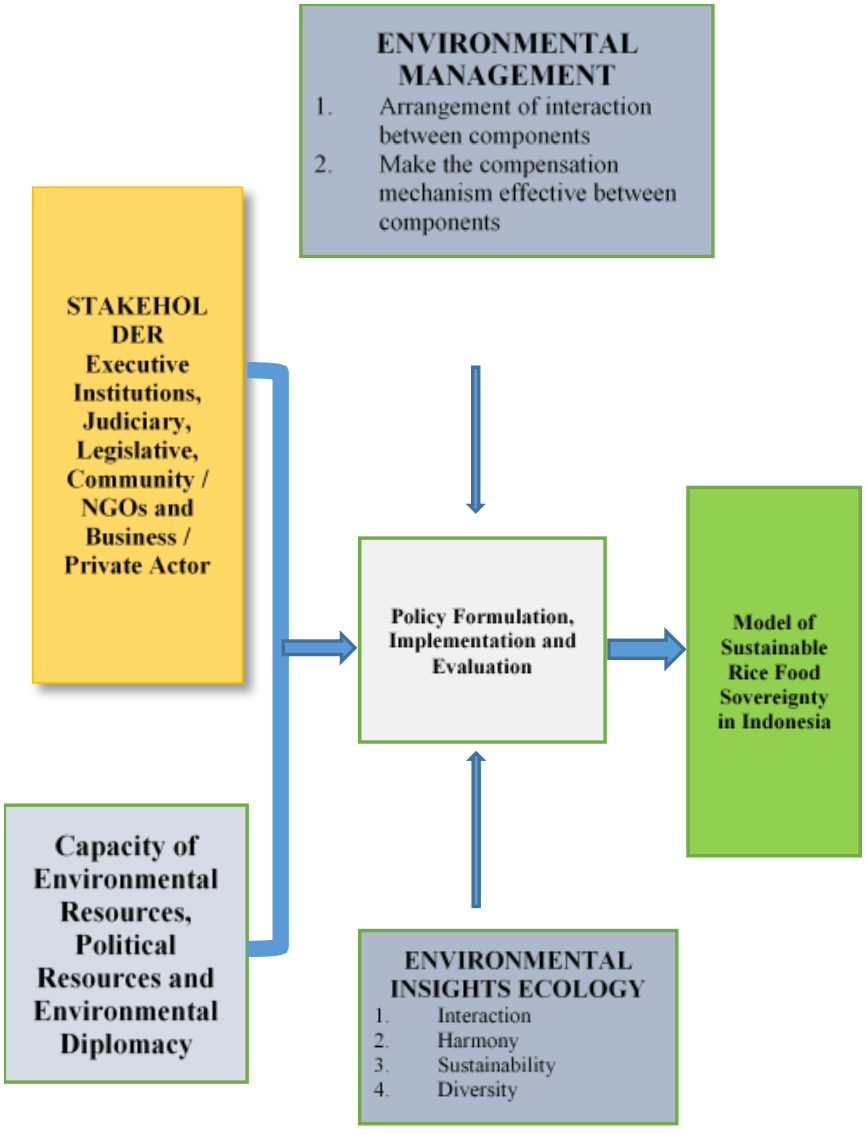

Figure 2 Model of Sustainable Rice Food Sovereignty in Indonesia.

And based on Table 14, the food other than rice that most respondents eat is cassava. Thus, cassava becomes an alternative to eat if there is no rice or a staple food other than rice.

Based on the data that has been collected by the author, both primary data from respondents and secondary data based on literature studies, the authors have compiled a Sustainable Rice Food Sovereignty Policy Model. This model is based on the results of analysis both from the capacity of political resources, the environment, and environmental diplomacy.

The author has mentioned the results obtained from the questionnaire distribution process, secondary data related to food sovereignty policies and environmental resource capacity. And has conducted an analysis based on three aspects, namely political resources, environmental diplomacy, and environmental resources themselves.

Food sustainability in the rice food policy model is under the definition of the environment **(Fischer, 2017)**, which means the spatial unity between all objects, forces, conditions, and living things including humans and their behavior, which affects nature itself, the continuity of life, and the welfare of humans and other living things. This food sustainability includes the existence of political resources, environmental diplomacy, and the capacity of environmental resources embodied in the food policy model. Political resources are part of the social dimension related to the rice food policy process. Environmental diplomacy, how an environmental policy, especially on rice food, can be profitable economically in Indonesia. As well as the capacity of environmental resources by looking at the carrying capacity, and accompanied by supporting technology that can be applied to achieve food security, especially rice food.

These three dimensions, namely the social, economic, and environmental dimensions in the rice food policy model, strive to achieve sustainable development. This sustainable development is environmentally sound, which is not only profitable economically and socially but also benefits the natural environment. Besides, this policy model by the dimensions of sustainable development must include Economically Profitable, Socially Acceptable, and Environmentally Sustainable.

So far, according to the data that the authors have collected, rice food security policies have not focused on the use of agricultural land or the development of new land for agriculture to create rice food production that can be available every year. If there is an increase in the price of rice per kilogram or liter, as well as limited sources of rice food in Indonesia, the government will make a policy to import rice. On the positive side, the rice import policy does not have a bad impact in general. This is because it can meet the food needs of the Indonesian people and maintain the stability of rice food prices in Indonesia.

The long-term side of the rice import policy tends to get worse over time. First, the amount of rice food production in Indonesia is decreasing over time. This condition is due to the rice import policy which has been running routinely and the use of agricultural land to become industrial land or oil palm plantation and housing. Second, there is a growing dependence on rice and is not accompanied by sustainable rice food production. Third, the lack of innovation in developing rice substitutes, which so far can be an alternative.

Also, food security is important because of the problems that have been a top priority both in Indonesia and in the world. These problems are divided into three components, namely food availability, access to food, and the benefits of food itself. The rice food sovereignty policy model that the author tries to provide is based on these three components of the problem. Food availability in Indonesia is seen in how much and the type of food it can produce, how food can be distributed, and how much food can be traded.

So far, the type of food produced in Indonesia has focused on rice food. This is because so far for the majority of people in Indonesia, the staple food is rice. Besides, there is a tendency that rice production will decrease each year due to the availability of agricultural land. Based on the results of distributing questionnaires to 169 respondents, it shows that the Indonesian people want to change their staple food to other than rice if rice is indeed scarce. The results showed that most of the substitute food other than rice for the staple food was cassava. The current condition of cassava is only a complementary food or snack. This potential should be an important concern so that it can be developed, not only as a snack but as a potential substitute for the staple rice food if rice food is experiencing a dire condition, namely scarcity.

The food distribution process also becomes an important point related to the process of rice food sovereignty. This food distribution includes the cost of fuel, distribution time, and quality of rice food to customers. The increase in fuel costs or the increase in vehicle fuel is the main key concerning the selling price of rice. The higher the fuel price, the higher the selling price of rice. Apart from that, the distribution process also includes the possibility of weather conditions during the distribution trip to the market which is then purchased by the customer. The condition of the rice can be damaged due to moisture or the presence of rice lice. This has resulted in a decrease in rice sales and distribution of rice to customers.

How much food can be bought and sold also depends on the production and distribution processes that have been carried out so far? Weather conditions and soil conditions that exist in this process are important to note. The government has been anticipating the provision of adequate facilities in the production process and additional distribution facilities to support the increasing demand for rice food. Anticipation according to the author apart from the Government by providing welfare for farmers. So far, farmers do not own their land and work on other people's land, so the income of these farmers is very minimal.

The components of access to food include affordability, allocation, and preference. Affordability is defined as the purchasing power of households or people for rice food. The current conditions vary widely to the condition of society regarding the purchasing power of rice food, which is distinguished from the middle to lower class and upper-middle class. Based on the results of the questionnaire that was given during data collection, it can be seen that most people buy rice in the range of 2 to 5 kg per week to buy rice. Per month it can be estimated that each family consumes between 8 s.d. 20 kg. Other results also show that some buy 50 kg of rice per week and some buy 0.5 kg of rice per week. These results indicate that there are middle to

lower-class people who cannot buy enough rice to support their families and there are those who buy rice excessively because the family is classified as the middle to the upper class.

The government has anticipated the provision of subsidized rice for the lower middle class. This is done to make the process of distributing food evenly distributed throughout society, not only for the upper-middle class but also for the lower middle class. However, the subsidized rice provided by the government usually has low conditions so that the content in rice is very low. The anticipation that according to the author can be done to realize food sovereignty, especially rice, is to continue to provide rice subsidies, but not reduce the quality of the rice itself. So that the nutrition obtained by the Indonesian people is evenly distributed and is not differentiated by certain groups.

The components of the allocation of sustainable rice food sovereignty are economic, social, and political mechanisms, when, where and how food can be consumed by the community. The purpose of this mechanism is that each region has policies that differentiate it from other regions. One example is that the demand for rice in urban areas is greater than that in rural areas. This is due to the large population in urban areas compared to rural areas, which makes the demand for rice in urban areas much greater than in rural areas. This allocation component is related to the preference component.

Preference components are defined as social, religious, and cultural norms and values that influence consumer demand for certain types of food. In several regions in Indonesia, rice is not their staple food. Like some areas where the staple food is sago, and that includes the social and cultural norms that have been applied from generation to generation. Therefore, in these areas, there is little or no demand for rice food, because they own land or produce Sago for their daily staple food needs. This condition usually occurs in rural areas, not in urban areas, so that the allocation components and preference components are related to one another.

In the food benefit component, it is seen from the nutritional value, social value, and food security. The nutritional value in question is the number of calories, vitamins, protein, and nutrients found in food consumed by consumers. In the process of producing rice food based on this nutritional value, it must pay attention to the content or ingredients during the process of planting to harvest. Often farmers use hazardous substances or pesticides in the process of planting rice seeds until the harvesting process. So that it can endanger consumers who consume rice. Therefore, there have been various breakthroughs in organic rice without preservatives or hazardous substances in the rice food production process. However, organic rice is traded at a higher price than ordinary rice, and only the middle and upper class can buy it. The solution that can be given by the author is to carry out a strict monitoring process starting from the initial process of planting rice seeds to harvesting. Besides, assist farmers in terms of seeds and supporting facilities to produce good rice food production.

Social value has a meaning almost the same as a preference, concerning social, religious, and cultural functions, and the benefits provided by these foods. The purpose of this social value is that not all people have the staple food of rice. This can be seen based on the culture and history that has been applied from generation to generation. In addition to the nutritional value and social value in the food benefit component, the safety of the food produced is also seen. Food safety is seen in the presence of potential toxins during production, distribution, and others. This potential can occur if some elements or farmers prioritize the maximum profit by not meeting normative standards in the rice food production process. The solution that can be given by the author is to be given a very strict monitoring process in the production process, to minimize these potentials.

The problems previously mentioned are based on these three main components, in addition to developing political resources, there is a need for environmental diplomacy and environmental resource capacity that need to be met to realize a Sustainable Model of Rice Food Sovereignty. The environmental diplomacy that the author provides is not in the realm of rice imports, which has been mostly carried out by the Indonesian government so far. The environmental diplomacy referred to by the author is the transfer of knowledge related to the sustainability of rice food in Indonesia.

This environmental diplomacy can create opportunities for cooperation, build trust, and resolve conflicts related to issues of the environment and shared natural resources. Environmental diplomacy in the domain of knowledge transfer provides several alternatives, including the provision of agricultural tools, provision of superior rice seeds, application of fertilizers, and provision of rice paddy land. Based on respondents, as many as 111 respondents showed that providing agricultural tools and pressing paddy field resistance were priorities to achieve rice food sovereignty.

Regarding Environmental Diplomacy between Indonesia and other countries, cooperation can only be done by providing agricultural equipment. The provision of agricultural equipment can be done by cooperating with developed countries that have the best facilities or tools in terms of the rice food production process. This environmental diplomacy is not only beneficial for the country, but it can also benefit Indonesia because it gets a transfer of knowledge related to supporting facilities towards good rice food production. The solution for granting rice paddy land, according to the author, cannot be done with Environmental Diplomacy. This is because granting rice paddy land can only be done by the Indonesian government itself.

Granting rice paddy land can be done by building new land for farming and keeping the agricultural land continuing every year. The current condition has the potential for damage to land planted for rice food production as a capacity of environmental resources. The capacity of environmental resources for rice food production can be overcome by establishing irrigation channels, using superior rice seeds, maintaining soil conditions at all times, and having a land restoration process so that the land can be used continuously to maintain rice food production for the Indonesian people. So that dependence on rice imports is increasingly minimized.

The analysis that the author has provided is related to the sustainable rice food sovereignty policy model, enabling the author to compile a Sustainable Rice Food Sovereignty Policy Model. This model looks at Political Resources,

Environmental Diplomacy, and Environmental Resource Capacity. These three things are to achieve Socially Acceptable, Economically Profitable, and Environmentally Sustainable.

Political Resources

The Rice Food Policy based on the Results of Literature Study and Questionnaire Distribution must pay attention to four aspects, namely: the fulfillment of community food needs, monitoring, and evaluation of food production, understanding of food other than rice, and policies for food diversification other than rice.

This policy must be written in-depth and comprehensively, both in urban and rural areas, as well as farmers and consumers. This deep and comprehensive process is part of a socially acceptable. The initial process of food production starting from the initial process to the final process (towards consumers) needs to be accepted by the community. What is accepted by the community is the existence of good quality and nutritious rice food, easy access to food for the community, and affordable prices for the community. As previously mentioned, based on the theory that the author uses, food sovereignty takes precedence before achieving food security.

Food sovereignty in terms of political resources can be realized by fulfilling the existing components of political resources in the form of policies for the welfare of the community so that rice food needs are met. Also, these policies were formulated not only to make rice food available to the public but by providing other food innovations as a substitute for rice. The potential for developing rice substitute food innovations, especially cassava based on the results of questionnaires to respondents. Cassava food development innovation policies can be realized to meet the daily staple food needs of the community.

Environmental Diplomacy

The economic aspect, which is economically profitable, can be realized by environmental diplomacy between Indonesia and other countries. Environmental diplomacy as well as other diplomacy seeks to realize an economic level, both at the state economy level in general and the economic level of society in general. The current condition of Indonesia's economy is based on the latest information, that Indonesia is increasing its foreign debt for the sake of development in Indonesia.

One of the ways to reduce or minimize the increase in foreign debt is to take advantage of the potential that exists in Indonesia, both in terms of human resources and in terms of natural resources. Indonesia, which is currently a developing country has limitations in several fields, especially in the field of rice food development which is the focus of this research. The limitations are the lack of rice fields, lack of functioning irrigation channels, lack of superior seeds, and lack of supporting facilities (for example tractors or agricultural technology).

The limitations of a developing country like Indonesia need to be addressed through the environmental diplomacy process with other countries. The process of environmental diplomacy is carried out by transferring knowledge related to the development of sustainable food production, especially rice, by applying environmentally friendly technology and providing superior seeds. However, the environmental diplomacy process must be adapted to the land conditions in Indonesia which have a tropical climate. It is because, if we don't see this condition, the environmental diplomacy process will not run well and it will not be beneficial for both parties.

Environmental Resource Capacity

Environmental resources are the final component to be able to create a model of sustainable food sovereignty (Figure 2). The stability of the land for producing rice food needs to be maintained because often after several years, the condition of the land decreases, and the yield of rice production is increasingly obedient and has less good results. Apart from seeing the land conditions, it is necessary to pay attention to the weather aspect. The weather aspect is related to climate change that has occurred so far, not only in Indonesia but also in almost all countries.

In terms of land conditions, treatment can still be given to recover by carrying out land management that follows environmental principles. The environmental principles are sufficient supporting facilities, one of which is an adequate irrigation channel. Other environmental principles are not to use pesticides or other chemicals, because they are not only harmful to consumers but also harmful to the condition of rice plants and the land. However, related to weather conditions, namely climate change, of course, it can be overcome, but still the effects of climate change cannot be completely fixed instantly.

Based on this, the capacity of environmental resources for rice food production needs to be managed properly from the start of production until the product reaches consumers. Apart from the capacity of environmental resources, this model of rice food sovereignty cannot be separated from the contribution of political resources and environmental diplomacy. This is because as a unit to achieve sustainable development.

In short, we can see the model of Sustainable Rice Food Sovereignty in Indonesia as shown in the diagram above, can be implemented and evaluated if the policy formulation is included the four aspects, such as; Environmental Management, Environmental Insight Ecology, Stakeholder and the Capacity of Environmental Resources, Political Resources, and Environmental Diplomacy are combined.

CONCLUSION

Food security has become a crucial issue in the last few decades. Not only in Indonesia, but almost all over the world are also experiencing various food crises to meet the food needs of the population whose growth is not accompanied by a significant increase in the amount of food availability. Various world institutions have been trying to find solutions and alternatives to cover the low growth in food security which tends to decline. There are many causes of these problems, including reduced human resources, inadequate availability of natural resources, and or starting to experience degradation, as well as natural disasters and climate change.

The government is expected not only to apply regulations that tend to solve short-term problems. It is hoped that this problem can find a solution to the root of the main problem

that causes the decline in national food security. The problems mentioned above cannot be overcome by simply importing rice, subsidizing the cost of fertilizers, or providing agricultural equipment which in the end do not have a significant effect. The implementation of the problem should be thoroughly searched to the smallest corner, then determining the solution to the problem, in the end, can be done. This of course tends to be somewhat difficult considering that Indonesia is still included in the category of developing countries which have limitations in several ways.

Building a local food system means fighting for the rights of citizens to have food sovereignty. The principle of food sovereignty is different from food security regardless of where the food is produced. Food sovereignty tends to uphold the rights of every citizen and local community as a whole to produce, distribute and fulfill food needs above all other interests, including trade. However, the concept of food sovereignty in no way contradicts the principle of food security, the two complement each other. Efforts to build food security without being followed by efforts to uphold food sovereignty will create new social problems, such as dependence on imported rice and low productivity of farmers. In Indonesia, there is no concept or model, or theory on sustainable rice food sovereignty policies that are relevant for implementation. Therefore, this research is expected to be able to provide solutions to food problems that exist in Indonesia.

Two main things will be implemented in constructing a model of sustainable rice food sovereignty in Indonesia; first, to generally analyze the capacity of political resources, environmental resources, and environmental diplomacy, and to create a model for sustainable rice food sovereignty policies. With the design of the rice food sovereignty policy model, it is hoped that it will be able to contribute empirically to the concept of sustainable development based on environmental/ecological principles to support the implementation of Indonesia's environmental diplomacy in national strategic programs, while still incorporating environmental and sustainable development principles so that in the end it will have implications for the achievement of Indonesia's 'food sovereignty and the clarity of Indonesia's bargaining position on global environmental issues in the context of environmental diplomacy. Then, the formulation of food sovereignty policies based on the use of resource capacity as a determinant of the success of policy performance and the impact of these policies will provide a conducive and constructive picture for stakeholders, especially business actors (private sector) in implementing sustainable environmental policies, especially aspects of natural resource management, protection. and strategic natural environment conservation and ensuring the people's welfare in the food sector.

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