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Research article

Cultivating Food Sovereignty in the Time of the Pandemic: An Analysis of Jokowi's Agricultural Policy

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Abstract. Food is a complex global development issue as there are still people who are unable to meet their total physical and intellectual capacity due to micronutrient deficiencies caused by food insecurity. This study examined the implementation of President Joko Widodo's policy to achieve the food security targets of SDG Goal Number 2 by the year 2030 through developing the agricultural sector and striving for food sovereignty and sustainability, particularly within the context of the Covid-19 pandemic. The authors used institutionalism theory with the top-down model approach. This involved discussing how government institutions and top-level government officials make policies to overcome existing problems, as well as stakeholder involvement in policies and program implementation. The data were obtained from the academic literature and through semi-structured interviews with stakeholders. Indonesia's food sovereignty efforts included three development missions in formulating programs and policies: (1) self-sufficiency; (2) sustainability; and (3) farmers' welfare. The Ministry of Agriculture did not stand alone in implementing each program and has sought to develop agriculture by collaborating with other domestic and international stakeholders. However, policy implementation and stakeholder involvement in realizing food sovereignty and sustainability in Indonesia still faced challenges in integrating the policy and programs to address the national concerns of food.

Keywords: food sovereignty, Jokowi's agricultural policy, Covid-19 pandemic, top-down institutional approach

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1. Introduction

Hunger and food insecurity are complex global development issues. It is estimated that 790 million people still lack daily access to sufficient food. One-third of the world's population cannot meet their total physical and intellectual capacity due to micronutrient deficiencies caused by food insecurity (1). Food is one of the primary components for realizing human resource quality and a pillar for national development. It plays a role in maintaining the economic, social, and political stability of a country. Hunger-related decreases in labor productivity will reduce a 6-10% in per capita GDP. Prenatal and early childhood malnutrition are linked to impaired cognitive performance, resulting in

lower productivity and lifetime earnings capacity. With a population of more than 270 million, Indonesia is still grappling with issues related to food security. The world food Programme estimated that 19.4 million Indonesian people could not meet their dietary requirements (2).

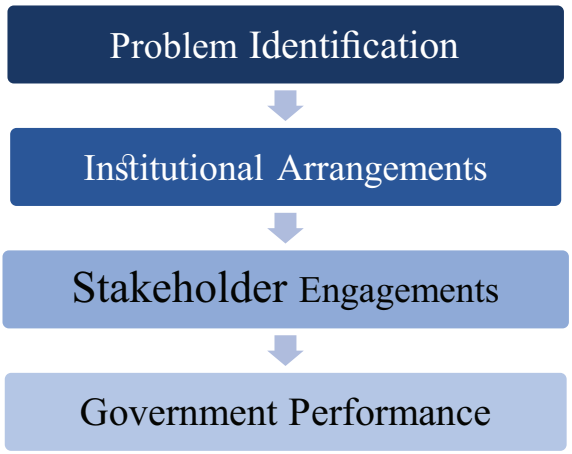
On September 25, 2015, 193 member countries of the United Nations adopted the 17 points of SDG as a reference to achieve sustainable development. The 2030 Agenda for Sustainable Development is a transformational vision that recognizes that our world is changing and that new challenges must be met if we live in a world free of hunger, food insecurity, and malnutrition in all of its forms (3). As a result, new and improved strategies are required to meet the 2030 Agenda, particularly Sustainable Development Goal (SDGs) number 2, which stipulates that by 2030, the country would have eliminated hunger, achieved food security, enhanced nutrition, and promoted sustainable agriculture. The commitment of the international community to achieve food security is stated in one of the SDGs 2030. The Sustainable Development Goal (SDGs) emphasizes the value of increasing small-scale food producer productivity while maintaining sustainable food production practices, one of which is in the agricultural sector (3). Several milestones must be reached due to these aims, including ensuring a sustainable food production system and introducing resilient agricultural practices that can increase production and productivity (4).

The election of Joko Widodo to become president became a catalyst for transforming Indonesian agricultural food policies. President Jokowi focuses on developing the agricultural sector to achieve independent production to ensure food insecurity in the food sovereignty policy. Food sovereignty in Indonesia refers to Law No. 18 of 2012 to achieve food sovereignty, resilience, and security. The law contains the state's obligation to respect, fulfill, and protect its citizens' food rights. Food sovereignty is the people's right to control their own agricultural and food systems, achieve food security through local production, and ensure the right to nutrient-dense, culturally acceptable food produced through a sustainable and environmentally friendly farming system (5). This issue has become more challenging during the recent coronavirus pandemic, which decreased the country's GDP. Indonesia's GDP contracted as much as 5.32 percent in the second quarter of 2020, the sharpest drop since the 1998 Asian Financial Crisis. A contracting economy limits access for consumers, and reduced demand hurts farmers (6). In the longer term, Indonesia will face a food crisis if there are no proper and immediate policy responses from the government. This research conducts a profound study on Jokowi's agricultural policy in cultivating food sovereignty, especially in the Covid-19 pandemic

2. Methods and Data

2.1. Methods

The method in this research used a qualitative approach. According to Creswell, it is used to delve deeper into social phenomena, emphasizing the researcher's interaction with the topic of study (7). By using the qualitative approach, including an expert interview method, the researcher tried to describe Jokowi's agricultural policy implementation with the Top-Down Model Policy Approach as follows;



Problem identification here is identifying the root cause of the problem and how serious it is. Institutional arrangements will analyze the policy and programs made by top-level government officials, including ministers and political executives, to achieve the goals. The Stakeholder engagements will explain the policy implementation processes by analyzing the involved stakeholder, such as relations and cooperation among ministries, the private sector, and state-owned enterprises (SEOs). In the end, the author would like to analyze how well the policy has been implemented and how the goals have been met.

2.2. Data

Data in this research was collected by conducting document studies and interviews. Document study techniques will be obtained from government data, official reports from international organizations such as the United Nations, FAO, official reports from the related ministries, articles, and other supporting journals. News can be obtained through official sites such as the ministries news portal, print media, or those accessed through

online sites. Furthermore, data was also collected from interviews with agricultural policy experts.

3. Results

This section is divided into the following subsections: a) Food Problems, b) Policy Implementation c) Agricultural Development Achievements Supporting Food Sovereignty, d) Cooperation in Policy Implementation.

3.1. Food Problems

Along with the continued increase in population, strengthening food security is very important, where the need for quality food with good nutrition also continues to increase. UU no. 18 of 2012 mandates that efforts to fulfill food consumption needs must prioritize domestic production. Efforts to meet food security must be based on food sovereignty and food resilience integrated into food availability and distribution and consumption subsystems (8). Food inflation is very influential on general inflation. Therefore, Food security and resilience are essential, considering that it will be increasingly difficult in the future if our food needs still rely on global markets. World food will still face fluctuations in supply and prices due to climate change, affecting world food production and the increasing demand for food due to the increase in world population and economic development. Increasing the supply of nutritious food is very important for improving the nutritional quality of the community (9). Of the 416 districts in Indonesia, as many as 71 districts have low food security. There are twelve (12) provinces that have a food vulnerability index below the national average (5.0), namely (1) Papua Province, (2) West Papua, (3) Riau Islands, (4) Maluku, (5) Bangka Belitung, (6) Riau, (7) East Nusa Tenggara, (8) West Kalimantan, (9) North Maluku, (10) North Sumatra, (11) Bengkulu, and (12) South Sumatra.

Meanwhile, the highest index (6.0) is held by DI. Yogyakarta and Gorontalo, and the lowest (1.8), Papua Province. With that value, Papua is the area with the lowest food security index. In 2020, Indonesia's food security situation was better than in 2018, where the number of districts/cities vulnerable to food insecurity (Priorities 1-3) decreased to 70 districts/cities (13.6 %) in 2020. The number of food-secure districts/cities increased from 438 districts/cities (85.2%) in 2019 to 444 districts/cities (86.4%) in 2020. The vulnerability area in 2018 and 2020 can be seen in Figure 1.

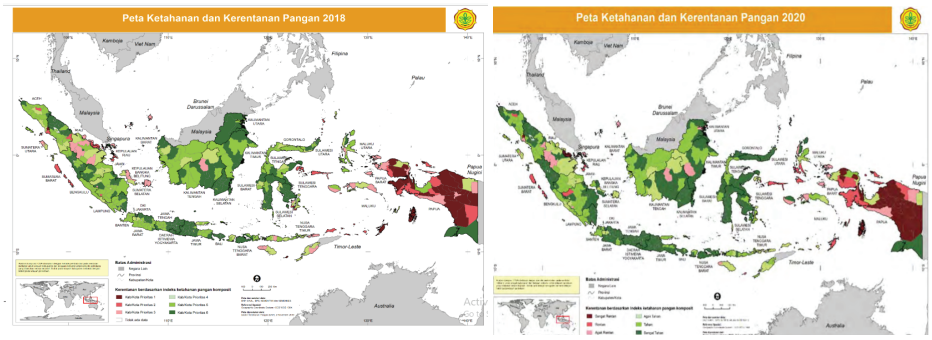


Figure 1: Vulnerability to Food Insecurity in Indonesia 2018 & 2020. (**Source:** Food Security and Vulnerability Atlas (FSVA) 2018 & 2020)

A high number of areas vulnerable to food insecurity are caused by several problems that are still happening. Indonesia's food problems are then described based on the food security pillars, such as food availability, food access, and food utilization. The availability aspects include the issues of low productivity, narrow business scale, land conversion, problems with irrigation services, and climate change. By the accessibility aspect, infrastructure and economy is still a problem for food system development. Meanwhile, the industry and local governments still have a limited supply of nutritious, safe, and diverse food in food utilization. The composition of local food ingredients is still not balanced, and supervision of the circulation of hazardous food ingredients is still weak.

The covid-19 pandemic has brought additional pressure to Indonesia's food system. The problem is mostly not on the supply side, but it is more on the other end of the system. Increased transaction costs and the decline of purchasing power due to the economic contraction have limited people's access to food. In addition, the domination of the informal sector with labor-intensive in the supply chain makes restructuring Indonesia's food system difficult. For instance, incorporating automation or vertical farming to enable social distancing needed as part of health protocols has not proved successful.

3.2. Policy Implementation

Efforts to achieve food sovereignty in Indonesia cannot be separated from the successes and failures in implementing various strategies and policies. Even so, Indonesia has had many improvements in terms of food security. This success can be seen from the increase in Indonesia's ranking and score on the Global Food Security Index (GFSI).

In 2016 Indonesia was ranked 71st, while in 2019, Indonesia increased to 62 of 113 countries (10).

The priority agenda in Nawacita, especially in food sovereignty, is implemented through programs and collaboration with various stakeholders. In implementing the food policy of President Jokowi in 2015-2019, there were several efforts made through multiple programs such as Special Efforts (UPSUS) to Food Self-Sufficiency, UPSUS for Rice, Corn, Soybeans (PAJALE), and Breeding Cattle Mandatory Pregnancy (SIWAB), Optimization of Swamp Land Use (SERASI) Empowerment Agricultural Poor Households (BEKERJA), Region Sustainable Food Houses (KRPL), and 1000 Seed Self-Reliant Villages. During the pandemic, the Ministry of Agriculture has come up innovatively with five (5) responses of *Cara Bertindak (CB)*. Those five CBs increase food production, local food diversification, strengthening food reserve and logistics, modern and smart farming, including food estate programs in the Central Kalimantan Province, and expanding the international market through food export.

3.2.1. UPSUS to Food Self-Sufficiency

The food self-sufficiency UPSUS program was implemented in the first term of President Jokowi's administration to solve problems and obstacles increasing production, productivity, stock management, national food distribution, and farmers' welfare (11). The program that was promoted to achieve food self-sufficiency in several strategic food commodities was carried out simultaneously in several provinces such as North Sumatra, East Java, Central Java, South Sulawesi, West Kalimantan, South Kalimantan, Jambi, and Central Kalimantan (12). President Joko Widodo, through the Ministry of Agriculture, is working to achieve food self-sufficiency among the three staple foods, such rice, corn, and soybeans, by implementing UPSUS PAJALE and SIWAB program (13). UPSUS PAJALE is strengthened by the Regulation of the Minister of Agriculture No. 14 of 2015 and No. 03/2015 concerning guidelines and scope for UPSUS to Accelerate Food Self-Sufficiency and increase sustainable production of strategic commodities. In the implementation period of UPSUS Pajale 2015-2018, the growth rate of rice production reached an average of 4.1% per year, which is above population and income/capita growth (14). Meanwhile, corn production increased and reached 21.66 million tons, an increase compared to 2014 production. Besides that, SIWAB (Mandatory Cattle Breeding) also stipulated through Ministry of Agriculture Regulation No.48/Permentan/PK to increase livestock production and productivity 210/10/2016 concerning Special Efforts to Accelerate the Increase of Cattle Breeding Populations. Domestic cattle production

is expected to increase the livestock population through the program to accelerate domestic meat production, increase the efficiency and effectiveness of livestock cultivation, reduce dependence on meat imports, and increase employment opportunities.

3.2.2. Optimization of Swamp Land Use (SERASI)

One of the efforts to enhance food production is through sustainable use of swampland by minimizing the negative impact of management activities on the environment. Currently, Indonesia has 25.2 million ha of inland swamps and 8.9 million ha of tidal swamps and 5.12 million hectares of tidal swamp and lowland areas that can become agricultural expansion areas (13). In 2018, the Ministry of Agriculture initiated the agriculture-based Save Rawa Welfare Program (SERASI) to optimize swamp land use. It was stipulated in the Minister of Agriculture No 40.1/Permentan/RC.010/10/2018. This program is implemented by using superior adaptive varieties of swampland so that crop productivity can be significantly increased and applying land management technology.

The Serasi Program started in 2018 with an area approach of approximately 5,000 ha each in Banyuasin Regency (South Sumatra) and Banjar Regency (South Kalimantan). In South Sumatra, the focus is on Banyuasin Regency with planned targets for Musi Banyuasin 35,143 ha, Banyuasin 82,559 ha, Oki 67,948 ha, Ogan Ilir 1,200 ha, East Oku 4,000 ha, Muratara 1,000 ha, Pali 5,850 ha, Oku 300 ha and Muara Enim 2,000 ha. For South Kalimantan, this program is focused on Batola, Tanah Laut, and Banjar districts which have a fairly large area. Batola Regency is 70,636 ha, Tanah Laut Regency is 17,750 ha and Banjar Regency is 38,363 ha (13).

3.2.3. Empowerment of Agricultural Poor Households (#Bekerja)

82.7 percent of villages in Indonesia are driven by the agricultural sector. An increase in the agricultural sector can improve village welfare, overcome nutritional problems (stunting), and reduce poverty. This program is under Minister of Agriculture Regulation No. 27/2018 to empower the poor to increase welfare and income through the agricultural sector in a sustainable manner. In 2018, this program was implemented in 19 districts in 10 provinces (South Sumatra, North Sumatra, Lampung, Banten, East Java, West Java, Central Java, South Kalimantan, and South Sulawesi. The implementation of this program was then expanded in 2019 with 20 provinces to Aceh, Riau, West Sumatra, West Kalimantan, Jambi, Papua, DI Yogyakarta, Southeast Sulawesi, Central Sulawesi, and East Nusa Tenggara (15). In 2018, the poor household target reached 200

thousand and increased in 2019, with 400 thousand households. The program packages received were in the form of 569,999 plantation plant seeds in 2018, horticultural plant seeds/seeds for 4,120 and 1,585 Ha, and 10 million and 20 million chicken/duck.

3.2.4. Sustainable Food Houses Area (KRPL)

"Sustainable Food Houses Area" (KRPL) was developed to utilize unproductive land in the yard, increase family income, and produce food to fulfill family food and nutrition. The KRPL program also supports handling stunting areas, food-vulnerability areas, developing border areas, and the Empowerment of Agricultural Poor Households (BEKERJA) program. In its implementation, KRPL has been carried out in more than 11,000 group villages that carry out KRPL activities in 2015-2019 and continues to increase (15).

3.2.5. 1000 Seed Self-Reliant Villages

Concerning food self-sufficiency as a program of President Jokowi for the 2014-2019 period, the government seeks 1000 Seed Self-Reliant Villages to achieve self-sufficiency in rice and soybeans (16). This program is intended to facilitate farmer groups (Poktan) and Association of farmer groups combined (Gapoktan) with breeder groups. This program aims to solve problems in the seed aspect to increase production, productivity, and farmers' accessibility to seeds that previously had not been able to meet seed needs optimally, either from the element of variety accuracy, quality, quantity, time, location, and price.

This program started in 2015 and was implemented in 31 provinces with as many as 1000 units of inbred rice commodities in several areas where seeds could not be fulfilled and imported seeds from other regions. Assistance is also equipped with agricultural inputs (seeds and fertilizers), facilities and infrastructure for processing and packaging seeds, drying floors, warehouses for storing seeds, and seed packaging materials. This program has several advantages, such as accuracy in seed production, timeliness, and the need for seeds in the area. However, the growth of community-based breeders requires several prerequisites, including the availability of seed sources and farmer skills and system development. In the following years, this program developed rice seeds and began to develop soybean seeds.

3.2.6. Five Cara Bertindak (CBs)

As the Minister of Agriculture, these five actions are formulated by Syahrul Yasin Limpo to ensure the national food supply. The first program is increasing production capacity. The Ministry of Agriculture invites agricultural actors to accelerate the planting of rice planting Season II 2020 covers an area of 6.1 million ha. The development of swampland in Central Kalimantan Province is 164,598 ha, including the intensification of 85,456 ha of swampland and the extensification of 79,142 ha of agricultural land. Second, local food diversification. Developing local food diversification based on local wisdom that focuses on one main commodity is the other pillar of the CBs. Third, strengthening food reserves and logistics systems by maintaining provincial government rice reserves (CBPP), then strengthening district/city government rice reserves (CBPK). Fourth, the development of modern agriculture, through the development of smart farming, the development and use of screen houses to increase the production of horticultural commodities outside the growing season, the growth of farmer corporations, and the development of food estates to increase the production of main food (rice/corn). Increasing the export of other food commodities and processed agricultural products is also essential during the pandemic. This action encourages the growth of new exporters through the development of agropreneurs and expanding Indonesia's global market, which is carried out simultaneously across Ministries/Agencies by foreign trade partners through bilateral and multilateral cooperation. Those five actions align with the five action tracks developed by the UN in the 2021 Food Summit System (17).

3.3. Agricultural Development Achievements Supporting Food Sovereignty

3.3.1. Food Production and Productivity

Of the five strategic food commodities, only rice and corn experienced an increase in production. Meanwhile, other commodities (soybeans, sugar, and beef) experienced ups and downs in increasing production. Rice and corn production continued to show an increase since 2015 (18). Production growth aligns with the growth in the harvested area from the development of planting areas and agricultural productivity supported by the provision of production facilities. The increase in productivity of rice and corn occurred in some areas, such as West Java, Central Java, East Java, and South Sulawesi, Banten, North Maluku, and Central Kalimantan. In addition, the government encourages

several places on the Sulawesi, Kalimantan, and Sumatra, also border areas, to develop their productivity (13).

In contrast to rice and corn, soybean production has varied movements. The decline in soybean production was influenced by decreased planted areas, especially in 2016 due to land-use competition. The relatively low production is still affected by the inadequate distribution of superior seeds and farmers' low interest in developing vegetable protein sources with low selling prices (15). For sugar production, production declines continued to occur due to the decline in sugar cane which reached 36.7 thousand hectares (18). To achieve the target, 705,000 ha of the sugarcane planting area and the construction of 16 sugar factories by 2023 are needed. In addition, beef production showed a fluctuation. For beef production, productivity and increase in cattle population are one of the main factors. During that period, the cattle population grew by an increase of 1.68 million heads.

Apart from achieving primary commodity production, agricultural productivity has also increased with the help of machine tools provided by the government, as many as 472.165 units in 2015-2020 time period, as shown in Figure 2.

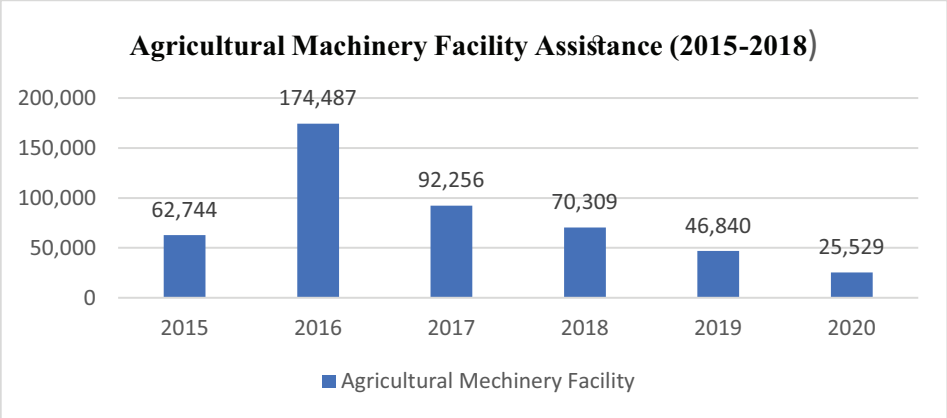


Figure 2: Agricultural Machinery Facility Assistance (2015-2018). (**Source:** Ministry of Agriculture, Directorate General of Agricultural Infrastructure and Facilities)

Agricultural machinery can reduce 7-9 % of rice yield loss rather than using the conventional way. In addition, the use of conventional labor is 70-80%, production costs are 30-40%, and reduces the rate of loss of rice yields at harvest from 20% to 10%, thereby increasing production by 10-20% (15). From an economic point of view, applying technology to agricultural machinery can save the cost of processing land, planting, and harvesting from Rp. 7.3 million/ha manually to Rp. 2.2 million/ha. The value of saving rice yields with the application of a combined harvester reaches Rp. 17 trillion/year.

To support increased productivity and food production, infrastructure development in irrigation is one of the most critical factors. Development and improvement of irrigation

networks of surface water, groundwater, and swamp showed an increase during 2015-2019, from 9,11 million hectares in 2015 to 9.95 million hectares in 2019 (18). Furthermore, groundwater and swamps also increased from 1.17 million hectares in 2015 to 3.01 million hectares in the rehabilitation of surface irrigation networks in 2019. Moreover, in the 2015-2019 period, the construction and improvement of pond irrigation also increased from 193.99 thousand hectares in 2015 to 281 thousand hectares in 2019. There are also reservoirs construction that reach 49 pools in 2019 (18).

3.3.2. Accessibility

The number of regencies/cities grew between 2015 and 2019. The number of regencies/cities vulnerable to food insecurity (Priorities 1-3) out of 88 districts/cities in 2018 decreased to 76 regencies/cities in 2019. Indonesia still faces the risk of food insecurity caused by high food prices compared to fixed income. Even though food is available on the market, household food access is determined by family purchasing power and the stability of food prices. Of the entire poor population in Indonesia, around 15.8 million people (60.90%) live in rural areas, and 10.14 million people (39.09%) live in urban areas. To suppress food commodity prices, the government has allocated large fertilizer subsidies for rice producers. Because rice accounts for a significant portion of overall food spending, high prices significantly impact poverty and food insecurity (19). However, Indonesian prices are still considered high by international standards. In 2017, medium-quality rice in the domestic market reached 10,000 per kg while the global market price was 6,000 per kg (20).

3.3.3. Food Consumption

In 2018, rice and other cereals accounted for around 65.7 percent of the Indonesian population's total calorie intake. The EAT-Lancet Commission recommends that carbohydrate intake is only about 34% of the total calorie intake per day (21). This condition makes Indonesia only record low scores on food diversity compared to other countries despite the high national PPH score. In 2019, the Global food security index noted that Indonesia was ranked 62 out of 113 countries with a score of 62.6. However, Indonesia's food diversification score is only 19, much lower than the average world score of 55.8. The food diversification program that the government previously ran to support this diversity is considered to have not been entirely successful due to limited funding (21). In addition, consumption of beef, fruit, and vegetables is still low in Indonesia. The

proportion of energy intake from beef in Indonesia is only 1.5% and is still lower than in other Southeast Asian countries (21). Moreover, the spending on fast and processed foods has risen continuously.

3.3.4. Farmers' Welfare

To measure the level of welfare of farmers, one indicator that can be used is the Farmer's Exchange Rate (NTP) and Farmer's Business Exchange Rate (NTUP). The Farmer's Exchange Rate (NTP) and Farmer's Business Exchange Rate (NTUP) can be seen in Figure 3 below.

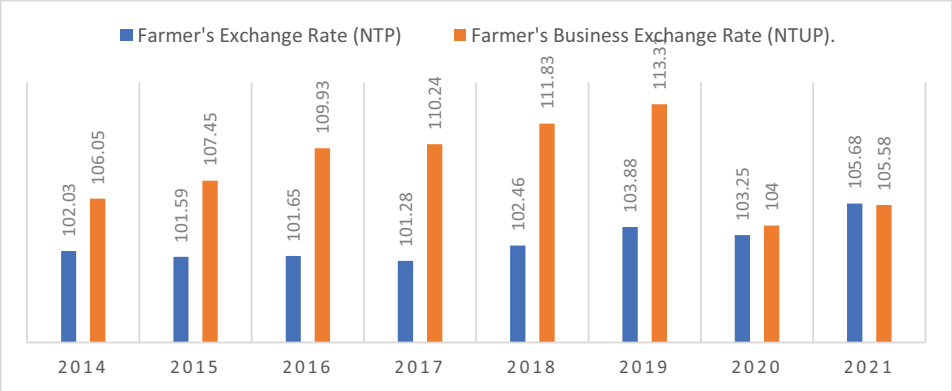


Figure 3: Farmer's Exchange Rate (NTP) and Farmer's Business Exchange Rate (NTUP). (2014-2019). (**Source:** Ministry of Agriculture, BPS)

NTP is calculated by comparing the price index that farmers receive with the price index that they pay. Compared to 2014, Farmer's Exchange Rate increased by 0.42%. In 2014, the NTP was worth 102.03 and became 102.46 in 2018 and 103,88 in 2019. In addition, the Farmer's Business Exchange Rate (NTUP) in 2018 significantly increased to 5.45%, compared to the NTUP in 2014 with a value of 106,05. It also grows in 2019 with a value of 113,31. During Covid-19 Pandemic, the farmers' price index still shows a positive trend where it can reach 105,68 for the NTP and 105,58 for the NTUP in September 2021. In addition to NTP and NTUP, the increase in farmer welfare can also be measured by the poverty rate in rural areas. Based on data from BPS, there has been a decline in the level of the rural poor from 17.77 million in 2014 to 15.15 million in 2019 (15).

3.4. Cooperation in Policy Implementation

To realize national food security, cooperative relations with various sectors must be well-coordinated, internationally and domestically. In this subchapter, the author takes an international and domestic approach. The domestic cooperation will be analyzed through a divided approach in approaching the important actors involved in realizing national food security between Government, Business, Academician and University, also Agricultural Institutions.

3.4.1. International Cooperation

In 2015-2019, to support President Jokowi's development vision, the Ministry of Foreign Affairs demonstrated its commitment through the commitment to "Diplomacy for the people" (22).In the agricultural sector, diplomacy focuses on efforts to overcome trade barriers and realize food security, development of agricultural commodities, and efforts to increase production and overcome trade barriers and realize food security. Related ministries and institutions are also involved in this diplomacy, such as the Ministry of Agriculture, Ministry of Economy, and Ministry of Trade (23).

In bilateral cooperation, Indonesia cooperates with Japan in increasing human resource development, especially in agriculture. This collaboration is carried out through the Ministry of Agriculture with training and internship programs for the younger generation in agriculture in Yokote, Japan. The program also aims to develop agricultural businesses in Indonesia and improve young farmers' skills, attitudes, knowledge, and mentality. In the livestock field, Indonesia cooperates with Australia to help develop superior seeds that can adapt to the climate in Indonesia. Like Australia, Indonesia also cooperates with New Zealand, Brazil, Paraguay, and Uruguay as countries that have advanced in animal livestock (24).

In 2017, at the 39th AMAF meeting in Thailand, food security cooperation was agreed to strengthen cooperation through the ASEAN Regional Guidelines on Food Security and Nutrition Policy. At this meeting, the Ministers also agreed on a strategic plan for ASEAN Plus Three cooperation in food, agriculture, and forestry for 2016-2025. The strategic plan is focused on promoting sustainable agricultural development, efforts to ensure food security, and increasing trade in ASEAN Plus Three countries. Not only that, the plan to extend the ASEAN Plus Three Emergency Rice Reserve (APTERR) to strengthen food security and assist member countries in emergencies for the next 5 (five) years (2018 - 2022) has been approved. During the meeting, the Indonesian Minister

of Agriculture supported the establishment of the ASEAN coordinating the ACCAHZ or Center for Animal Health and Zoonoses, which will support efforts to prevent and control transboundary diseases and zoonoses in the region (25).

3.4.2. Domestic Cooperation

To strengthen the integration of the food system so that it becomes more efficient and effective, the Ministry of Agriculture does not stand alone in pursuing food sovereignty in Indonesia. In realizing the vision of food sovereignty in the Nawa Cita, the Ministry of Agriculture cooperates with some stakeholders, such as the Government, Academician, Business, and Agricultural Institutions. This integrated collaboration maximizes each actor's potential, thereby facilitating efforts to achieve food sovereignty.

3.4.3. a) Government

In achieving the food sovereignty goal of the 2015-2019 RPJMN, the Ministry of Agriculture cooperates with several ministries and institutions such as the Ministry of Social Affairs, Ministry of Public Works and Public Housing of the Republic of Indonesia (PUPR), Ministry of Industry, Ministry of Villages and Development of Disadvantaged Regions (PDT), Ministry of Health, Meteorology, Climatology, and Geophysical Agency (BMKG), National Population and Family Planning Agency (BKKBN) and local governments (26).

In the first period of President Jokowi in 2014-2019, Integration between government and government institutions went well. However, there were still some obstacles in it. In his interview, Prof. Dr. Bambang Budhianto stated that:

"...The Ministry of Agriculture is the leading sector in producing, then supported by the Ministry of PUPR. There is the Ministry of Villages to mobilize the community. For marketing and processing, there is the Ministry of Industry and Trade.... Especially for sufficient food for the community, in production, cooperation between Ministry of Agriculture and PUPR is quite good..."

Although, there are still some problems in inter-ministerial integration in several programs and policies taken and implemented by each ministry, which was also explained by Prof. Dr. Bambang Budhianto that:

"the most striking case in farmers' production for sale and then consumption by the community, the relationship is closer to the ministry of trade. Now here, the multi-sectoral cooperation between the 2014-2019 period between the ministry of agriculture and the ministry of trade is not that good, mainly related to imports."

It is still disagreements between the relevant ministries of production and the availability of food commodities. The Ministry of Agriculture stated that national production is sufficient. At the same time, the Ministry of Trade believes that imports are still needed to meet people's needs. Not only that, programs between the Ministry of Agriculture and the Ministry of Social Affairs are also considered contradictory. There is no sustainability aspect in one of the programs initiated by the ministry of social affairs. Meanwhile, the sustainable empowerment program by the Ministry of Agriculture is still focused on farming families, so it is not comprehensive. Prof. Dr. Bambang Budhianto conveyed this in his interview:

"The next one is reducing the poverty rate. From this policy, the Ministry of Agriculture cooperates with the Ministry of Social Affairs, the BKKBN..... At least with the Ministry of Social Affairs, if we are to operationalize, reducing poverty, we are giving access to the poor by empowering or empowering themselves. Well, at the Ministry of Social Affairs, it's more in the form of social assistance, if it's not possible to give it a complete solution (the problem), especially BLT. Now at the Ministry of Agriculture, starting in 2018, there is a program called BEKERJA. BEKERJA tries to empower the community directly, but because the Ministry of Agriculture initiated the agricultural program, only poor farming families are accessed... The Ministry of Social Affairs deals with the problem of poverty. Still, the main program is not empowering but providing direct assistance."

3.4.4. b) Business

For rice commodity, rice seed producers are dominated by SOEs for the seed subsidy program through the Public Sharing Obligation (PSO) program. Private rice seed producers use market mechanisms to distribute their products. A small number partner with state-owned enterprises to distribute subsidized seeds (27). In the interview conducted, Prof. Dr. Bambang Budhianto also explained that:

"Most of the production facilities produced and supplied, such as fertilizer, are SOEs, although the private sector also has quite involved. Moreover, for subsidized fertilizer, it is by SOEs. Maybe the one that is not subsidized is the private sector, even though it is small. Poisons or pesticides, or fungicides, most of which are private. Moreover, rice seeds have only three inputs: SOEs, the private sector, and the farmers themselves. State-owned enterprises and the private sector produce half of the seeds used in Indonesia. So, 50% of the seeds supplied, 50% of the farmers themselves. 50% of them buy every season produced by the private sector and SOEs."

In addition to SOEs, the government, through the ministry of agriculture and the Ministry of Trade, cooperates with BULOG to establish HPP and strengthen government food reserves in each region by developing and managing food barns that also involve the regional government (Pemda) (28). Likewise, with corn, he also stated that there is a very significant role for the private sector, such as the following Prof. Dr. Bambang Budhianto statement:

"In corn, the involvement of seed producers is almost 100 percent private because the technology is higher and even then, more is still controlled by multinationals .... It is practical in corn if the seeds are private, pesticides and fungicides are private, and the rest are farmers. The role of the government is for program assistance ...."

Unlike corn and rice, the partnership pattern in soybean is lacking because the private sector's interest in soybeans is significantly less. The private sector has started to get involved in soybean commodities but is still limited in providing management facilities. The need for participation in cultivation and management is still needed, as explained by Prof. Dr. Ir. Giyatmi Irianto:

".... the importer in the Jakarta area built a place for processing tempeh in the South Jakarta area and then made a hygienic production house. But that's from processing. We need them to participate in cultivation so that soybean productivity can increase."

In sugar production, the role of state-owned and private companies can be seen from the number of sugarcane plantations owned by Indonesia. State companies have 76 thousand ha of the harvested area or from the total sugarcane plantation land in Indonesia, which reached 482,239 hectares (ha) in 2016 with a production of 361 thousand tons. Meanwhile, private plantations produced 651,000 tons with a harvested area of 112,873 ha (29). In 2019, white crystal sugar production reached 2.2 million tons, with the contribution of state-owned plantations at 11.68% and the private sector 27.59% (30).

The availability of beef, especially beef cattle breeding, the feed industry, artificial insemination, and it's trading activities are part of agribusiness. The subsystem then processes primary commodities into ready-to-use, ready-to-eat, ready-to-consume products. It requires support from banking, transportation, counseling, which involves the government and the private sector. For the cattle breeding business process to run safely, the government's intervention can be seen from the assistance of facilities such as quarantine cages, pregnant cow pens, estrus cattle pens, and IB preparations that must be done to meet the standards of breeding cattle business. After that, then the role of the private sector is seen from the nursery subsystem (31).

Not only from production factors, but the business sector also has a role in the farmers' welfare sector, such as the People's Business Credit (KUR) program. This program is aimed at strengthening business capital and increasing access to financing through a guarantee scheme. Furthermore, the implementation of KUR that aims at the farmers' welfare was not appropriately implemented. Prof. Bambang also explained the implementation of KUR in the interview:

"...The institutional relationship between the one that facilitates the Ministry of Agriculture and the farmers and the one that facilitates banking funding is not very suitable for its operations. KUR is there, but banks still ask for guarantees, and what's more, the nature of banks still asks for a share when they make profits, and when they lose, only farmers will be responsible. This is a normal thing. Banks have to do that. It just means that the KUR program has not fully accommodated the needs of farmers. That is an example of farmers' welfare is lagging in terms of the fact that it is, and institutional relations are still not good."

In some sectors, especially in corn, the role of the business sector is very significant. However, this does not apply to every commodity and aspect of food fulfillment and farmer welfare. In several elements, the participation of the private sector and SOEs needs to be encouraged. The synergy between the government and the private sector needs to be strengthened and monitored to achieve the program's target.

c) Academician and Universities

From the research results, it is known that the role of academicians in encouraging agricultural development in Indonesia is to do science development and conduct research. Academicians, in this case, conduct research to provide input on policy models for the development of the agricultural sector and help provide extension and participate in developing agricultural, human resources, and some universities. In research and development, an academician at major universities, in particular, has developed new varieties. However, the result on the grown varieties did not appear to be so significant. This issue is caused by several factors as described by Prof. Dr. Bambang Budhianto, such:

"...it could be that the resulting link match did not meet... research is carried out in layers from basic research, intermediate research, and applied research .... Even if it is direct research to the community, there is less, even more, less is used because what we are missing is a bridge from research so that it can be commercialized."

Based on these interviews, it can be concluded that not all research results are directly applied because there are layers of existing research. Not all results can be used because of the bridge from research to be commercialized. Another factor is also

due to the incompatibility between the type of research with the needs of the industry and the small budget that the researcher has. This issue was conveyed by Prof. Dr. Ir. Giyatmi Irianto, in an interview conducted by the researcher as follows:

"... Often it is not optimal because there is no match between the type of research and the needs of the industry.... I read that Indonesia's research budget is still low among ASEAN countries, namely for 2020 alone, the proportion of research funds is only about 0.31% of GDP, which is very small compared to Singapore 6%, and Malaysia 1.3%."

Not only academicians but also universities play a role in agricultural development. One of them can be seen in the UPSUS program, which involves many stakeholders, including universities. Universitas Gadjah Mada (UGM) is one of the universities in partnership with the Ministry of Agriculture regarding the assistance of UPSUS for Food Self-Sufficiency by deploying students and alumni to carry out assistance to the farmer level. Student assistants act as liaisons between universities that share technological innovations with farmers. They are also involved in several activities on the UPSUS program that have several target areas in Yogyakarta and Central Java, one of which is the Wonosobo Regency (32). Until 2019, the Agricultural Research and Development Agency and other research institutions and universities produced various technology packages that can be utilized to explore the potential of agricultural resources to increase productivity, quality, and production capacity (16).

3.4.5. d) Farmer Institution

In 2014, there were 322,390 Farmer Groups (Poktan), 37,632 Farmer Group Associations (Gapoktan), 10,065 Farmer Economic Institutions (Koptan), and 6,596 units of Village Extension Posts (Posluhdes). Not only efforts such as extension, management of facilities, and agricultural facilities and infrastructure at the agricultural business level, but also farmer empowerment innovations through the community business institutions engaged in the food sector. However, in managing the farmers' institutions, farmer groups do not have clear guidelines for use and distribution, resulting in unclear profit sharing. As a result, farmer group members feel less belong to the organization. There is no evidence of membership and ownership, so farmer members are still less active, and their role is less than optimal. There are also double jobs in farmer institutions, namely social and business tasks.

4. Discussion

Based on the results above, strategic commodities with successful performance are rice, corn, sugarcane, and beef. Meanwhile, soybean is a commodity whose achievement is far below the target due to low selling prices at the farm level, expensive and heavy maintenance, so it cannot compete with imported products. Increased soybean production still has limited quality and quantity of superior seeds, low intensity obtained by farmers so that it is less attractive to farmers, low adoption of farmer technology, and no guarantee of soybean marketing so that the selling price of soybeans at the farmer level is low. Not only in the production of strategic commodities, but agricultural productivity through the development, improvement and rehabilitation of irrigation is also still faced with several problems such as natural disasters, less than optimal participation of farming communities and the performance of irrigation management institutions, conversion of productive land functions, and delays in the land acquisition process (33).

Increased productivity is also carried out through agricultural mechanization, which increases the efficiency of human labor, the degree, and standard of living of farmers, quantity, and quality of agricultural production, enabling the growth of the farming business from subsistence farming to commercial farming (13). However, mechanization also has unwelcome impacts, including shifting human and livestock labor and income inequality. Automation requires high costs in the procurement and maintenance of tools. Management of 100 ha of paddy fields with complete mechanization requires a tractor rental fee of Rp. 120 million/season, rice transplanter of Rp. 110 million/season, weeding equipment of Rp. 51 million/season, and a combined harvester of Rp. 229 million/season. If other input costs and land rent are considered, the total cost needed to manage 100 ha of rice farming in paddy fields is IDR 1.20 billion/season (13).

The purchasing power of the people can also be said to have improved with the decline in the poverty rate in Indonesia. Lastly, the welfare of farmers has also increased, which can be seen from the increase in the NTP and NTUP figures. However, farming communities still have limited ability to raise capital through financing and investment institutions. This is due to the small scale of control, the exploitation of farmers' land, and the difficulty of obtaining capital assistance so that the results are not following the target. The 2016 SUSENAS stated that only about 15 percent of the approximately 8,000 sample farmers had access to bank credit, while the majority of 52 percent continued to rely on their funds, as well as cooperatives, families, and other non-bank financial institutions. Meanwhile, another 33 percent of farmers rely on credit for the National

Program for Community Empowerment (PNPM) and credit for people's businesses (KUR) (34). The inability of farmers to access formal sources of capital is caused by the difficulty of applying for credit and the absence of the required collateral.

According to the cooperation in policy implementation, the non-integration of inter-ministerial programs and policies certainly affects national goals. If each ministry and government agency integrate well, the results will also be more optimal. Besides the government, cooperation and involvement of some stakeholders and the role of other actors are required to improve, especially in increasing productivity and production for food commodities with quantities far below the target. For farmer groups, the institution has difficulty in achieving the goals that have social and business aspects. The farmer groups have a non-business role with the function as a tool to distribute aid and at the same time as a forum for vertical interaction between the government and farmers, a place for teaching and learning to enhance their knowledge, skills, and attitudes, as well as build and developing their independence in farming, also become as a place to strengthen cooperation among fellow farmers. Not only that but Poktan/Gapoktan are also at the same time a business organization that is required to create profits.

The food system is a sector that is highly integrated with the global market. This integration makes providing people's demand more sophisticated, not limited to conditions of local or territory of the country. At the same time, food systems are also particularly vulnerable to disruption, conflicts, and wars, or global pandemics as it is today.

There are two trends in response to this disruption; the first is strengthening supply standards global chain, and secondly, the formation of alternative models at the local level. Both of them were carried out within the framework of the food system. Consumers will be more selective in choosing products. Global consumers will demand higher product safety, better nutrition, and quality, including supply availability. Big companies will be increasingly dominant in the food production chain to secure the supply chain and quality assurance, even down to the smallholder level.

On the other hand, independent communities may try different routes to maintain availability, better nutrition, and environmental friendliness. This effort is made by employing local food production through locally grown food which will also impact the emergence of various small business food producers at the local level. This local food movement will contribute to the environment and aspects of sustainability that is better. The government of Indonesia formulated five action plans during the pandemic. Although the plans emphasize more on the supply side, it also takes sustainability and local empowerment into consideration.

Also, it is too early to judge the success of Indonesia's government strategy in ensuring food security during the pandemic. However, there are some positive results. The agricultural sector grows and contributes to 1.75 % of the GDP. Meanwhile, other sectors of the economy are facing significant negative growth during the coronavirus pandemic. There is also an increase in labor distribution of the agricultural sector from 27.53 % (2019) to 29.76 % (2020) due to reverse urbanization. This change in labor distribution will give a long-term benefit to the food supply system.

5. Conclusion

In this research, we addressed Indonesia's food policy implementation under Jokowi's presidency to ensure food sovereignty and sustainability, particularly during the Covid-19 pandemic, using the Top-Down Model approach. In the part of food security, food production has not been able to balance population growth. Along with population growth, agricultural land is also shrinking. Indonesia is a developing country with a middle income per capita and has high population growth, which results in high demand for food. For food availability, Indonesia still has low productivity, which is influenced by the land quality, use of chemicals, and the inappropriate distribution of seeds in terms of quality, variety, and time. It is also influenced by the lack of irrigation services which Indonesia has a high rate of damage to irrigation. Land ownership by farmers is also still slightly so that it affects the welfare of farmers where farmers with land ownership of less than 0.5 hectares continue to grow. In addition, the conversion of agricultural land is also increasing.

Another problem is climate change, which affects the occurrence of natural disasters and impacts shifting rainfall patterns and rising temperatures on earth surfaces. Access to food is also still lacking. Infrastructure in Indonesia is still uneven, which obstructs food distribution. Not only infrastructure but poverty is also a problem that affects housing access and purchasing power. There is also a problem in the use of food which is influenced by the low diversification and nutritious food and supporting facilities in achieving food security

Jokowi's leadership aims to strengthen the solid foundation for the next stages of development to produce sustainable growth and prosperity for the people. In President Jokowi's administration, there has been significant effort and growth in food sovereignty and sustainability in agricultural development. The respective ministries then implement strategic directions and national policies. The Ministry of Agriculture does not stand alone in implementing each program and seeks to develop agriculture by collaborating

with other domestic and international stakeholders. In international cooperation, agricultural cooperation under the Ministry of Foreign Affairs focuses on overcoming trade barriers and realizing food security, developing agricultural commodities, increasing production, overcoming trade barriers, and creating food security.

This paper shows that the partnership between stakeholders is quite good at the domestic level. However, it is still necessary to integrate inter-ministerial programs. The non-integrated policies can be seen in the Ministry of Agriculture and Ministry of Social Affairs assisting poor households. The assistance from the Ministry of Social Affairs was considered only for the short term. It did not empower the low-income family to increase their income and welfare, which is not aligned with the sustainable aspects of the policy approach. There is also a lack of data synchronization with the Ministry of Trade related to import, which is essential in making decisions regarding the fulfillment of Indonesian food reserves and imports. The business sector also needs to be encouraged to promote and develop agriculture, particularly soybean production, which continues to decline and is dependent on imports. For the academician, it is also necessary to make research efforts that are sustainable and basic and increase university collaboration in assisting the development of farmer resources. In agricultural institutions, especially in Poktan and Gapoktan, it is also necessary to clarify institutional regulations to increase the role and productivity of institutions.

The researchers suggest further and more in-depth research related to food sovereignty efforts in realizing every aspect of national food security. In addition, researchers also present in-depth analysis to find out cooperation and Indonesia's foreign policy regarding food issues, implementation of international agreements and commitments into domestic policies and programs, and Indonesia's role in dealing with food problems globally, especially on the Covid-19 pandemic.

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