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Old, New, and Future Food Policy Before and After the Covid-19 Pandemic in Indonesia

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Abstract

This article aimed to identify aspects of Old, New, and Future Food Policy before and after the Covid-19 pandemic. before and after the COVID-19 pandemic. The method used was a Narrative review using a comprehensive and descriptive approach through a literature search. Data searches were conducted through online instruments using Pubmed, ScienceDirect and Google Scholar published from 2003-2023. The search was conducted using keywords related to factors driving changes in the nature of food and nutrition policies based on Maxwell's theory. The COVID-19 pandemic has affected food insecurity supported by restrictions on economic activity and mobility imposed by the government which have led to economic contraction and job losses, which in turn can affect household access to food. Policies after the COVID-19 pandemic regarding food related to aspects of food availability, aspects of food access, and aspects of food utilization as well as the importance of stakeholders in the success of food policy programs in Indonesia.

Keywords: Food; Policy; Pandemic; COVID-19; Indonesia;

Introduction

The social impact of food during the COVID-19 pandemic is an important issue in terms of food sustainability. It covers the social impact of food production and consumption, including farmers' working conditions, food accessibility, and equitable distribution. This social impact can affect the social and economic welfare of the food supply chain. In addition, food sustainability has the potential to impact the environment and human health. (Source: Bisoffi et al., 2021; Ghosh-Jerath et al., 2022; Hansen, 2022; Clark et al., 2019). However, the social impact of food can vary depending on the geographical and cultural context.

Food consumption and production by consumers account for about one-third of a household's environmental impact, making it important to address food sustainability issues. The COVID-19 pandemic could exacerbate existing food vulnerabilities, including economic challenges, disruptions in the food supply chain, higher food prices, reduced access to assistance programs, and increased income inequality. As a result, people who were already facing difficulties in accessing sufficient and nutritious food may find themselves in an even more precarious situation during the pandemic. Restrictions on economic activity and mobility imposed by the government to slow the spread of the virus have led to economic contraction and job losses, which in turn can affect household access to food the COVID-19 pandemic has had a significant impact on the economy (Amare et al., 2021). Restrictions on economic activity and mobility to slow the spread of the virus, which led to an economic contraction of 3.5 to 5 percent in 2020. The impact of the pandemic has also exacerbated food security vulnerabilities that already exist in the country.

Policy recommendations urgently needed to improve the safety of residents in urban areas post-COVID-19 include the following. Increase food security and availability by strengthening urban and rural agriculture, supporting small-scale food

producers, and preserving local biodiversity. Promote healthier eating habits by facilitating access to nutritious foods while reducing unhealthy choices. Advancing more sustainable transport systems to reduce air pollution and improve environmental well-being. Increasing accessibility to basic health services in urban areas. These recommendations are based on research on the impact of the COVID-19 pandemic on human health and the environment, as well as past experiences in formulating urban and food policies. They aimed to establish resilient urban and food policies to improve citizen safety following the COVID-19 pandemic.

As in other countries, COVID-19 has contributed to Indonesia's food security pressures through declining incomes and reduced access, as well as rising transaction costs and uncertainty in the country's food system (Ikhsan &; Virananda, 2021). Strategies to contain and mitigate the transmission of COVID-19 through strict mobility restrictions, including worldwide government options for public safety (Lassa, 2020). The COVID-19 pandemic has disrupted the improvement of food security and nutrition in Indonesia. Compared to the previous year, in 2020 the prevalence of undernutrition and quality food consumed was measured by worsening dietary patterns, as well as the scale of food insecurity decreasing but at a slower rate. Social assistance programs distributed by the government on time have a positive impact in easing the burden. This is supported by social safety net programs and government efforts to maintain food supply and price stabilization.

It is necessary to provide policy recommendations that can help improve the situation in urban areas and ensure the availability of safe and healthy food for citizens. This article aims to provide an understanding of how public opinion regarding food sustainability evolves and how it can assist policymakers and authorities in developing, placing, and addressing issues relevant to food sustainability.

Methods

The method used was Narrative review using a comprehensive and descriptive approach through literature search. The data obtained comes from journal articles, proceedings, and conferences, government regulations, policies, and official websites that had keyword linkages in accordance with the topic of study. Data searches were conducted through online instruments using Pubmed total 12 articles, Sciencedirect total 14 articles and Google scholar total 34 articles published from 2003-2023. The search was conducted using keywords related to the factors driving changes in the nature of food and nutrition policies based on Maxwell's theory in various sectors, namely urbanization, technical changes, income growth, lifestyle changes, mass media and advertising, and price changes (Maxwell and Slater 2003). Maxwell's theory is used to understand the impact of food policy on society, the economy and the environment.

Results

Table 1. Aspects of Old, New and Future Food Policy

Aspects	Old	New	Future
1. Population	Mostly in the Village	Mostly in urban areas	The majority of Indonesia's population resides in urban areas, with a portion still living in rural regions.
2. Work	Most farmers	Most of the non-farmers work	Most Indonesians are engaged in non-agricultural occupations, with only a minority involved in farming
3. Jobs in the food sector	Mostly in food production and primary marketing	Mostly in the food industry, manufacturing and retail	In Indonesia, the food sector predominantly consists of roles in food production and primary marketing, although there has been a notable shift towards the broader food industry, encompassing manufacturing and retail.
4. Food Marketers	Food Companies	Food and beverage companies	Food Marketers Food Companies Food and beverage companies Food and beverage companies still remain

			the dominant food and beverage marketers today, the food and beverage industry in Indonesia is increasing
5. Food Chain	Long – large amount through food	Long – large amounts through food and drink Short – A large amount through food and drink	1. Long – a large amount through food and beverage to food and beverage from food companies 2. Short – A large amount through food and beverage to food and beverage from the culinary industry
6. Typical Food Preparation	High proportion of Fast food Food cooked at home	High proportion of Fast food Food is cooked at home, in restaurants and street stalls	Lifestyle changes in Indonesia's urban centres largely follow established market trends, with office workers having less time to cook, or less mood to do so, but demanding health-promoting foods.
7. Types of food	Basic Staples, unbranded	Processed Food, branded products more animal products in the diet	1. Frozen Food 2. Ready to eat 3. Functional food 4. Local food packaged using technology
8. Packaging	Low	High	1. Active &; Intelligent Packaging → regulates the condition of packaged food with the ultimate goal of maintaining product quality both by extending shelf life and monitoring food safety → lists Fresh meter 2. Modified Atmosphere Packaging (MAP) □ product packaging using packaging materials that can withstand the entry and exit of gas □ Ready-to-eat sayu fruit 3. Vacuum Pack (preserve the freshness of food) 4. Frozen food (Freezing foof preserves) 5. Retort Packaging (for ready to eat meals) foods that can be stored for a long time, such as rendang or gudeg from Jogja 6. Eligible Packaging
9. Purchased Food Bought in	Local stalls or shops, open markets	Supermarkets	1. Purchases in supermarkets are still high, traditional markets are declining, while online applications are seeing a significant increase 2. E-commerce as Digital Marketing

10. Food Safety	Pesticide poisoning, Pesticide residues on food, food poisoning in the poor, infectious diseases by salmonella	1. Fermentation is one of the technologies used for food preservation. 2. Fermentation improves the nutritional quality of food and contributes to food safety especially in conditions where refrigeration or other food processing facilities are not available 3. Following HACCP principles 4. The Sanitary and Phytosanitary Standard (SPS) agreement is becoming a more important issue and a source of tension and friction in international trade negotiations as tighter demand for SPS in developed countries tends to increase along with their income and health awareness.	1. Fermentation is constantly increasing 2. Some developing countries, such as Argentina, China, and Cuba, are deliberately developing domestic industries dealing with GM crops and foods)
11. Malnutrition, Chronic Diseases (Obesity, heart disease and diabetes	Malnutrition, Chronic Diseases (Obesity, heart disease and diabetes	1. Iron deficiency anemia (IDA) has reached epidemic proportions in developing countries and has become a major global public health problem, affecting mainly children aged 0–5 years and young women of childbearing age, especially during pregnancy 2. The COVID-19 pandemic, which has spread rapidly and widely around the world since the end of 2019, has had a major impact on food security and nutrition. 3. The closure of restaurants and other food service facilities led to a sharp decline in demand for certain perishable foods, including dairy products, potatoes, and fresh fruits,	1. The increase in meat prices caused by the policy has been shown to have some positive effects on diets, such as a reduction in fat and cholesterol intake, but also some negative effects, such as a reduction in iron and calcium. 2. International regulation is important because risks to food security, whether climate, environmental, political or economic, are more easily transmitted between countries in more globalized food systems. 3. Food policy has been defended by the Ministry of Agriculture, with a supporting role played by the Ministry of Health. Food policy is increasingly a concern of the Ministry of Trade and Industry, the Ministry of the Environment, and competition authorities

		as well as specialty items such as chocolate and high-value cuts of meat (Lewis, 2020; Terazono and Munshi, 2020). The movement of food through international trade routes was heavily affected by lockdown measures	
12. Nutritional issues	Micronutrients, sugar and salt use, poverty	1. One option to reduce micronutrient deficiencies is biofortification 2. As a process of increasing the nutritional value of edible plants through selective conventional breeding, mineral fertilization, or advanced GMO approaches. In addition, product quality, post-harvest loss, food taste, cooking time, yield, and pest resistance can also be improved along with the biofortification process. The targets of biofortification are mostly concentrated on people living in rural areas who mostly depend on staple crops to meet their food needs. 3. Especially developing countries with a high percentage of malnourished population are interested in this integrated biofortification, combining modern agronomic interventions and genetic improvement of food crops. As a result, corn, rice, wheat, beans, pearl millet, sweet potatoes, and cassava have all been biofortified with increased concentrations of Fe, Zn, or provitamin A in various developing countries	Western diets such as diets high in saturated fat, sugar and processed foods and low in fiber are often as a lifestyle of modern society characterized by obesity supported by low physical activity
13. Food Insecurity	Farmer	urban and rural poor	The quality of food cultivation and productivity in Indonesia began to pioneer since 2017 and in 2023.

			Indonesia has been able to produce food that can be accepted abroad with better quality standards. Increased domestic food production and local food industry in line with improved food system.
14. Main sources guncangan pangan nasional	Poor rainfall and other production shocks	International prices and other trade issues	Increased domestic food production and local food industry in line with improved food system. Therefore, economic stimulus is needed by entrepreneurs in agriculture to produce better quality products. In addition, support for stable food access is urgently needed to ensure equitable distribution to all levels of society.
15. Main sources of household food shocks	Poor rainfall and other production shocks	Income shocks lead to food poverty	Rising food prices create regressive shocks, both domestically and between countries. Increased risk of global recession, creating geopolitical conditions, tighter monetary conditions, and increasing inflation continue to weigh on investment flows in emerging *markets*. Restricted food exports cannot have an impact on improving food price increases. This risk has a negative impact with the higher cost of living of households supported by subsidies and other social protection policies.
16. Handling for household-level food scarcity	Social safety net, panga assistance	Social protection policy, fund transfer (income transfer)	Social protection policies, income transfer, food assistance for special groups (school feeding program/children, pregnant women, seniors) related to addressing special nutritional problems
17. Scope of Role in Food Policy	Ministry of agriculture, relief/rehabilitation , health	Ministry of trade and industry, consumer relations, food activist groups and NGOs	Ministries of agriculture, health, trade and industry, environment, development planning, consumer groups, women, producer organizations, private sector, NGOs, youth groups, mass media
18. Focus on food policy	Food policy technology, service reforation, supplementary feeding, food as work incentives	Competition and rents in the value chain, industry structure of industry structure and retail sector, future of markets, waste management, advertising, healthy living education, food safety	Sustainable production and consumption of trade and markets, shrinkage and food waste, Healthy food education, food safety, food system reselie, climate change (low-carbon production) and the carrying capacity of food production, indigenous food and gastronomy
19. International Key Actors	FAO, WFP, UNICEF, WHO, CGIAR	FAO, UNIDO, ILO, WHO, WTO	FAO, WHO, WTO, IFAD, WFP, UNEP, UNDP, WB are developing new non-UN actors such as GAIN

and cross-border CSO alliances

Part of the population in Indonesia was still in urban areas, working non-farmers. The substantial shift from workers to agriculture and supported by smaller reductions in wage levels in the sector compared to other sectors especially as Indonesia faces the COVID-19 outbreak outlines policy recommendations related to social safety nets, supply chain resilience, and technology use. Food and beverage companies still remained the dominant food and beverage marketers today, the food and beverage industry in Indonesia has increased. In the long run a large amount goes through food and beverage for food and beverage from food companies while in the short term a large amount gone through food and beverage for food and beverage from the culinary industry.

Changes in the lifestyle of urban people in Indonesia currently follow market trends such as established office workers had little time to cook, but demand healthier food to maintain body fitness. Types of food that were often consumed by people today are Frozen Food, Ready to eat, Functional food, and Local food that is packaged using technology.

Active & Intelligent Packaging on packaged food aimed to maintain product quality in extending shelf life and monitor food safety through the inclusion of Fresh meters. Modified Atmosphere Packaging (MAP) was a product packaging that can withstand the entry and exit of gas in long-stored foods such as ready-to-eat vegetable fruits, Vacuum Pack (preserve the freshness of food), Frozen food (Freezing foof preserves), and Retort Packaging (for ready to eat meals). This was supported by food purchases using online applications which rose significantly, while online applications saw a significant increase.

The quality of food cultivation and productivity in Indonesia began to pioneer since 2017 and in 2023. Indonesia had been able to produce food that could be accepted abroad with better quality standards. Increased domestic food production and local food industry in line with improved food system. Therefore, economic stimulus was needed by entrepreneurs in agriculture to produce better quality products. In addition, support for stable food access was urgently needed to ensure equitable distribution to all levels of society. Rising food priced create regressive shocks, both domestically and between countries. Increased risk of global recession, creating geopolitical conditions, tighter monetary conditions, and increasing inflation continue to weigh on investment flows in emerging *markets*. Restricted food exports could not have an impact on improving food price increases. This risk had a negative impact with the higher cost of living of households supported by subsidies and other social protection policies.

Social protection policies, income transfer, food assistance for special groups (school feeding program/children, pregnant women, seniors) related to addressing special nutritional problems. Ministries of agriculture, health, trade and industry, environment, development planning, consumer groups, women, producer organizations, private sector, NGOs, youth groups, mass media. Sustainable production and consumption of trade and markets, shrinkage and food waste, Healthy food education, food safety, food system respervience, climate change (low-carbon production) and the carrying capacity of food production, indigenous food and gastronomy. Key actors in addressing the current food problem were FAO, WHO, WTO, IFAD, WFP, UNEP, UNDP, WB developing new non-UN actors such as GAIN and cross-border CSO alliances.

Discussion

According to the Central Statistics Agency, most of Indonesia's population 57.9 live in urban areas, while 42.1 percent live in rural areas (Central Bureau of Statistics 2022). In rural areas, community employment was dominated by the agricultural sector. However, the work of people in urban areas works in the fields of services, employees, traders, and factory workers. In 2015, workers in the manufacturing food industry sector of about 17.4 percent rose to 18.25 million in 2018. In the first quarter of 2022, the food and beverage industry contributed more than one-third or 37.77% of the GDP of the non-oil and gas processing industry (Ministry of Industry 2017).

Food and beverage companies still remained the dominant food and beverage marketing players today, increasing this industry from 2020 to 2021 which was 2.54 percent around Rp775.1 trillion (Ministry of Finance 2022). Before 2020, food marketers in Indonesia focused more on selling through physical stores and restaurants. Digital trends were driving consumer behavior change in 2020 that was sustainable and has an impact on health (Jílková and Králová 2021; Rangaswamy *et al.* 2022; Kalashnikova *et al.* 2023) . However, since the COVID-19 pandemic, many food companies have switched to selling online or online, through e-commerce or application-based platforms such as GoFood and GrabFood (Amalia, 2021). Food

marketers also adjust their marketing strategies by increasing promotions on social media and optimizing digital marketing strategies in order to reach a wider range of consumers online (Riwayadi and Wulandari 2022).

Before 2020, the food chain was usually very long because there was a lot of processing and distribution of food and beverages before it reached the end consumer. Before 2020, the food chain was usually very long because there was a lot of food and beverage processing and distribution before it reached the final consumer (Post 2002). However, with the growing popularity of the local and organic movement, many people are now trying to cut their food and beverage chains directly by supporting local farmers and buying fresher, organic produce (Suharjo *et al.* 2016) . Typical food preparation was done in a more traditional way, such as the used of natural ingredients and cooking techniques that have been passed down for generations. However, after 2020, the COVID-19 pandemic caused changes in typical food preparation, mainly due to hygiene and health aspects that were increasingly considered (Prakoso 2021). The pandemic had also triggered healthy food trends and more diverse food choices, such as the more popular organic or vegan foods (Saberina and Aprianti 2022). It also affects the preparation of typical meals, where more and more organic and healthy ingredients were used. The need for local business support is also increasingly being considered, with the increasing popularity of small and medium enterprises offering typical foods with local and environmentally friendly raw materials (Suherlan 2018).

The increase in packaged food purchases was a response to urban consumers' need for convenience that saves time and the desire for variety (Rada 2010). The shift in food consumption patterns had resulted in an increase in consumer tendencies that desire product practicality, high in nutrients, then supported by taste, texture, and color looks fresh, without preservatives, and safe for consumption so that it demands the need for food technology in preserving food, inhibiting the development of bacteria and microbes, increasing nutrition, facilitating consumption, reducing food loss and food waste.

Changes in people's food consumption increased the popularity of fast food, but traditional food still had a high demand, thus encouraging the traditional food industry to meet people's needs. Traditional food was served with modern innovations to improve quality, nutrition, convenience, marketing, new flavors or new variations, market innovations, and packaging. Traditional foods using packaging technology resulted in longer shelf life and allow for wider distribution (Vanhonacker *et al.* 2013) . One of the traditional foods such as coconut milk powder, UHT coconut milk, gudeg, chili sauce, and others. In addition to traditional foods that were processed modernly, the demand for frozen food also continues to increase. Based on MarkPlus, since the COVID-19 pandemic, 46.8% of subjects chose to cook themselves and 27.9% of subjects who consumed fast food, one of which was frozen food (Pernando, 2020).

The demand for meat and other animal products worldwide was increasing due to rising incomes, increasing populations and other sociocultural factors. This trend was a global problem because meat production was a major cause of global warming and environmental degradation (Komarek et al., 2021) . Therefore, finding ways to make diets more sustainable by reducing animal protein consumption had become a food security issue and a public health issue (Willett et al., 2019).

The sales growth of the online retail industry in packaging trends had increased in Asia, which is 19% per year, shifting packaging trends that were previously more concerned with the appearance and durability of packaging. Technological advances in packaging innovation and to address the issue of food safety risks that were particularly vulnerable, such as wet food. Consumption of packaged foods was experiencing rapid growth. The packaging industry in Indonesia was expected to reach 159.2 billion units by 2024 with a growth rate of 2.4%, and 44% of that share was food products (Global Data, 2020).

The COVID-19 pandemic had exacerbated food insecurity in Indonesia with several contributing factors, including increased protectionist policies, making it difficult for underprivileged families to obtain food due to rising domestic prices. The impact of COVID-19 on food in Indonesia also included a downward production trend, inadequate distribution capacity, and trade restrictions. The risk of food insecurity during and after the pandemic would have a serious impact in Indonesia, especially considering that before the pandemic, around 9% of the population or around 22 million people had experienced malnutrition between 2017 and 2019 (Unicef, 2021). World food markets were particularly vulnerable to shocks, especially when supply and demand countries undergo policy changes.

Climate change had significant impacts on food systems, including in terms of food production, storage, accessibility, and price stability. Climate change had the potential to affect agricultural productivity globally (Gornall et al., 2010) . High rainfall as one of the impacts of climate change could cause the emergence of various diseases in cultivated plants, disrupt the growth cycle, and damage crop yields. Agricultural commodities vulnerable to climate change in Indonesia

include rice, kale, mustard, potatoes, long beans, cayenne pepper, red chili, shallots, mangoes, bananas, and oranges (Marseva et al., 2016).

In addition, the impact of climate change could also affect the social and economic conditions of the community, especially when disasters such as floods occur. The flood had a significant negative impact on the people and environment of Mayhura (Sholihah et al., 2020) . In addition to causing economic losses, floods can also damage infrastructure, threaten food security, and disrupt public health. Farmers in Indonesia, as one of the groups that rely heavily on the agricultural sector, are among the groups most vulnerable to climate change. Adaptation and mitigation efforts need to be made to protect farmers and communities faced with the negative impacts of climate change in the context of food sustainability. Indonesian farmers were one of the most vulnerable to climate change (Arifah et al., 2022; Suryanto et al., 2020).

In the regulation issued by the Minister of Agriculture as the Daily Chairman of the Food Security Council number 43/Permentan/OT.140/2010 concerning Food and Nutrition Alert System Guidelines (SKPG), food insecurity was defined as a condition in which an individual or group of individuals in an area is unable to obtain sufficient amounts and types of food to lead a healthy and active life. Food insecurity could also be interpreted as a state in which the level of food availability and security in an area, community, or household was insufficient to meet the physiological needs necessary for the growth and health of a portion of the population. However, in general, food insecurity could be caused by factors such as regional conditions or household or individual conditions, or it could be a combination of both.

Priorities in preventing the effects of the pandemic on food companies, and the effects of the pandemic on the food supply chain. Hygiene and the use of masks and gloves are two of the most significant attributes to prevent and combat the pandemic situation in terms of food safety (Prasetya et al., 2022). The implementation of food safety management systems such as Hazard Analysis and Critical Control Points (HACCP), and Good Manufacturing Practices (GMP) was important to reduce the risk of COVID-19 infection(Olaimat et al., 2020) . Genetically modified foods were now being widely consumed. In 2011, more than 90% of corn and soybeans in the U.S. were genetically modified (Yuwono Prianto et al., 2020) . GM generally focuses on human and environmental safety, consumer labeling and choice, intellectual property rights, ethics, food safety, poverty alleviation, and environmental preservation (Bawa & Anilakumar, 2013).

The COVID-19 pandemic, which had spread rapidly and widely around the world since the end of 2019, has had a major impact on food security and nutrition. The ongoing crisis had affected the food system and threatened people's access to food through various dynamics. There was a major disruption to the food supply chain following lockdown measures, affecting food availability, price and quality (Aday (Aday & Aday, 2020; Nordhagen et al., 2021) . The closure of restaurants and other food service facilities led to a sharp decline in demand for certain perishable foods, including dairy products, potatoes, and fresh fruits, as well as specialty items such as chocolate and high-value meats (Bairagi et al., 2022). Nutritional problems increased before and during the COVID-19 pandemic, especially micronutrient deficiencies(McAuliffe et al., 2020) . One option for reducing micronutrient deficiencies was biofortification (Ofori et al., 2022) . This had influenced some countries to develop interventions that could help combat malnutrition and hidden hunger. Biofortification had been projected to be a sustainable solution to hidden malnutrition and hunger.

In the aspect of addressing food scarcity at the household level, the old policy focused on social safety nets and food aid. The new policy was still the same in principle but with developments such as integration with social protection policies, cash transfers (*income transfers*), food assistance for special groups such as for children under five or school children (school *feeding program*), as well as for pregnant women and seniors related to efforts to overcome special nutritional problems or deal with certain disaster situations.

In Indonesia, these forms could be found, for example, in the Social Assistance Program in order to overcome the impact of the COVID-19 pandemic. NoerKaisar (2021) examined various forms of social assistance during the handling of the pandemic such as the Family Hope Program (PKH), Social Cash Assistance (BLT), Village Fund Cash Direct Transfer (BLT Dana Desa), Basic Food Social Assistance (BSS) for the Jabodetabek area, Pre-Employment Card, Basic Food Karti and Electricity Subsidies. Some food-related assistance was BSS and Basic Food Cards. When there was an increase in the price of certain commodities such as cooking oil, the government conducts market operations to reduce prices. Some food assistance was also associated with the nutritional needs of special groups such as the Nutrition Program for School Children (PROGRAS) in collaboration with (WFP, 2021). Currently, various food assistance was also developed in the context of efforts in the program, reducing stunting rates in Indonesia.

Within the scope of the role of the parties in the context of food policy, the old policy rests on the role of the Ministry of Agriculture, disaster rehabilitation or the Ministry of Health. The role of the wider parties

includes the Ministry of Agriculture, Health, Trade and Industry, Development Planning, consumer groups, women, the private sector, civil society organizations, youth groups and the mass media. This development was related to the complexity of food issues that not only rely on the dimension of production, but also included aspects of trade and markets, the inclusion of environmental issues in the food sector and the wider linkage between food, health and climate change.

BAPPENAS (2021) had facilitated the process of preparing a roadmap document for food system transformation in Indonesia by involving parties in an inclusive and participatory manner. The document explains the importance of a multi-stakeholder platform in order to achieve the goal of transforming a healthy, inclusive, resilient and sustainable food system. This illustrated a shift and expansion of focus from the old food policy that was oriented towards technology, supplementary feeding and food as a work incentive (labor intensive) to a broader focus. In the new food policy, the study included analysis of the structure of the food industry and retail, marketing, food waste treatment, food advertising, healthy living education and food safety, as well as critical analysis of competition and rents from the food value chain. As an example of shifting and expanding the focus of the study is a study from BAPPENAS together with LCDI, UK-Aid, Waste 4 Change and the World Resources Institute (2021) which revealed the level of food waste in Indonesia in the 2000-2019 period of 23-48 million tons, or equivalent to 115-184 kilograms per capita per year, where economic losses reached Rp. 213-551 trillion / year. This kind of study was not found in the old food policy.

In addition, in terms of international actors involved in food policy, there had been significant developments. In the old policy, the actors involved were FAO, UNICEF, WFP and CGIAR. Currently, the issue of food was seen as a system that is broader, complex and related to other systems, so the role of international organizations has become wider with the role of organizations such as UNDP, IFAD, UNEP, World Bank, ADP and various non-UN actors such as GAIN, various scientific alliances and international civil society organizations. The role of these various actors could not be separated from the food system which is considered to have an important role in achieving the sustainable development goals (SDGs), especially the goal to eliminate poverty and hunger. The United Nations had set food system transformation as a global policy agenda through the holding of the *UN Food System Summit* in September 2021 (UN, 2021)(UN 2021).

Conclusion

Food policy moves dynamically along with the development of socioeconomic, scientific and technological contexts, as well as specific momentum that drives policy change. Referring to the framework Maxwell (2003) distinguishes between old and new food policies in terms of 19 aspects ranging from population dimensions, supply chains, technology, to policy for a and the actors involved in it. This framework is important to develop in the current context, adding a prediction of how future food policies will be.

From the analysis of this paper, future policy developments there are food policies that repeat old policies and there are completely new policies along with the development of issues, technological modernization and the current special context. The COVID-19 pandemic is one of the momentum that affects the development of food policy at present and in the future. One of the important things is the global agreement that puts food system transformation as a strategy in achieving the sustainable development goals (SDGs). In the future, food policy will become more complex with the relationship between one issue and another, such as the relationship between food, environment and health (food, climate and health nexus).

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Author Contribution and Competing Interest

AEY and DM provide concepts for writing and oversee the writing process. AH, WAKP, IDP, ES, DA analyzed data and wrote articles. Others provided input and suggestions for article improvement. All authors contributed to article writing.

References

Aday, S., & Aday, M. S. (2020). Impact of COVID-19 on the food supply chain. *Food Quality and Safety*, *4*(4), 167–180. https://doi.org/10.1093/fqsafe/fyaa024

Amalia, Q. (2021). Persepsi Konsumen Terhadap Faktor yang mempengaruhi Niat Menggunakan aplikasi Go-Food di Masa Pandemi COVID-19. *... Industrial Research Workshop and National Seminar*, 4–5. https://jurnal.polban.ac.id/ojs-3.1.2/proceeding/article/view/2841/2220

Amare, M., Abay, K. A., Tiberti, L., & Chamberlin, J. (2021). COVID-19 and food security: Panel

data evidence from Nigeria. *Food Policy*, *101*(April), 102099. https://doi.org/10.1016/j.foodpol.2021.102099

Arifah, Salman, D., Yassi, A., & Demmallino, E. B. (2022). Livelihood vulnerability of smallholder farmers to climate change: A comparative analysis based on irrigation access in South Sulawesi, Indonesia. *Regional Sustainability*, *3*(3), 244–253. https://doi.org/10.1016/j.regsus.2022.10.002

Badan Pusat Statistik. (2022). *Persentase Penduduk Daerah Perkotaan menurut Provinsi, 2010-2035*. https://www.bps.go.id/statictable/2014/02/18/1276/persentase-penduduk-daerah-perkotaan-menurut-provinsi-2010-2035.html

Bairagi, S., Mishra, A. K., & Mottaleb, K. A. (2022). Impacts of the COVID-19 pandemic on food prices: Evidence from storable and perishable commodities in India. *PLoS ONE*, *17*(3 March), 1–15. https://doi.org/10.1371/journal.pone.0264355

BAPPENAS. (2021). *Food Loss and Waste di Indonesia: Dalam Rangka Mendukung Ekonomi Sirkular dan Pembangunan Rendah Karbon*. Badan Perencanaan Pembangunan Nasional. http://greengrowth.bappenas.go.id/pengelolaan-limbah-makanan-yang-berkelanjutan-berkontribusi-pada-pembangunan-rendah-karbon-di-indonesia/

Bawa, A. S., & Anilakumar, K. R. (2013). Genetically modified foods: Safety, risks and public concerns - A review. *Journal of Food Science and Technology*, *50*(6), 1035–1046. https://doi.org/10.1007/s13197-012-0899-1

Bisoffi, S., Ahrné, L., Aschemann-Witzel, J., Báldi, A., Cuhls, K., DeClerck, F., Duncan, J., Hansen, H. O., Hudson, R. L., Kohl, J., Ruiz, B., Siebielec, G., Treyer, S., & Brunori, G. (2021). COVID-19 and Sustainable Food Systems: What Should We Learn Before the Next Emergency. *Frontiers in Sustainable Food Systems*, *5*(March), 1–14. https://doi.org/10.3389/fsufs.2021.650987

Clark, M. A., Springmann, M., Hill, J., & Tilman, D. (2019). Multiple health and environmental impacts of foods. *Proceedings of the National Academy of Sciences of the United States of America*, *116*(46), 23357–23362. https://doi.org/10.1073/pnas.1906908116

Ghosh-Jerath, S., Kapoor, R., Dhasmana, A., Singh, A., Downs, S., & Ahmed, S. (2022). Effect of COVID-19 Pandemic on Food Systems and Determinants of Resilience in Indigenous Communities of Jharkhand State, India: A Serial Cross-Sectional Study. *Frontiers in Sustainable Food Systems*, *6*(March). https://doi.org/10.3389/fsufs.2022.724321

Global Data. (2020). *Indonesia's packaging market to grow at 2.4% CAGR and reach 159.2 billion units by 2024.* https://www.globaldata.com/media/packaging/indonesias-packaging-market-grow-2-4-cagr-reach-159-2-billion-units-2024-says-globaldata/

Gornall, J., Betts, R., Burke, E., Clark, R., Camp, J., Willett, K., & Wiltshire, A. (2010). Implications of climate change for agricultural productivity in the early twenty-first century. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *365*(1554), 2973–2989. https://doi.org/10.1098/rstb.2010.0158

Hansen, T. (2022). Consumer food sustainability before and during the COVID-19 Crisis: A quantitative content analysis and food policy implications. *Food Policy*, *107*(December 2021), 102207. https://doi.org/10.1016/j.foodpol.2021.102207

Ikhsan, M., & Virananda, I. G. S. (2021). How COVID-19 Affects Food Security in Indonesia. *LPEM-FEB UI Working Paper 061*, *June*, 1–10. https://www.lpem.org/wp-content/uploads/2021/07/WP-LPEM-061_How_COVID-19_Affects_Food_Security_in_Indonesia.pdf

Jílková, P., & Králová, P. (2021). Digital Consumer Behaviour and eCommerce Trends during the COVID-19 Crisis. *International Advances in Economic Research*, *27*(1), 83–85. https://doi.org/10.1007/s11294-021-09817-4

Kalashnikova, T., Panchuk, A., Bezuhla, L., Vladyka, Y., & Kalaschnikov, A. (2023). Global trends in the behavior of consumers of retail enterprises in the digital economy. *IOP Conference Series: Earth and Environmental Science*, *1150*(1). https://doi.org/10.1088/1755-1315/1150/1/012023

Kementerian Keuangan. (2022). *Kondisi Industri Pengolahan Makanan dan Minuman di Indonesia*. https://www.djkn.kemenkeu.go.id/kanwil-suluttenggomalut/baca-artikel/15588/Kondisi-Industri-Pengolahan-Makanan-dan-Minuman-di-Indonesia.html

Kementerian Perindustrian. (2017). *Industri Makanan dan Minuman Masih Jadi Andalan*. https://kemenperin.go.id/artikel/18465/Industri-Makanan-dan-Minuman-Masih-Jadi-Andalan

Komarek, A. M., Dunston, S., Enahoro, D., Godfray, H. C. J., Herrero, M., Mason-D'Croz, D., Rich, K. M., Scarborough, P., Springmann, M., Sulser,

T. B., Wiebe, K., & Willenbockel, D. (2021). Income, consumer preferences, and the future of livestock-derived food demand. *Global Environmental Change*, *70*(August), 102343. https://doi.org/10.1016/j.gloenvcha.2021.102343

Lassa, J. A. (2020). *Food Security Under COVID-19 in Indonesia :*

Marseva, A. D., Ekonomi, D., Fakultas, L., & Ipb, M. (2016). *Jurnal Ekonomi dan Pembangunan Indonesia Analisis Faktor Resiliensi Rumah Tangga Petani dalam Menghadapi Variabilitas Iklim Analisis Faktor Resiliensi Rumah Tangga Petani dalam Menghadapi Variabilitas Iklim Resilience Factor Analysis of Farmers Household Dealing with Climate Variability Pendahuluan Perubahan iklim merupakan salah satu fenomena*. *17*(1). https://doi.org/10.21002/jepi.v17i1.02

McAuliffe, S., Ray, S., Fallon, E., Bradfield, J., Eden, T., & Kohlmeier, M. (2020). Dietary micronutrients in the wake of COVID-19: an appraisal of evidence with a focus on high-risk groups and preventative healthcare. *BMJ Nutrition, Prevention & Health*, *3*(1), 93–99. https://doi.org/10.1136/bmjnph-2020-000100

Noerkaisar, N. (2021). Efektivitas Penyaluran Bantuan Sosial Pemerintah untuk Mengatasi Dampak COVID-19 di Indonesia. *Jurnal Manajemen Perbendaharaan*, *2*(1), 83–104. https://doi.org/10.33105/jmp.v2i1.363

Nordhagen, S., Igbeka, U., Rowlands, H., Shine, R. S., Heneghan, E., & Tench, J. (2021). COVID-19 and small enterprises in the food supply chain: Early impacts and implications for longer-term food system resilience in low- and middle-income countries. *World Development*, *141*, 105405. https://doi.org/10.1016/j.worlddev.2021.105405

Ofori, K. F., Antoniello, S., English, M. M., & Aryee, A. N. A. (2022). Improving nutrition through biofortification–A systematic review. *Frontiers in Nutrition*, *9*(December), 1–20. https://doi.org/10.3389/fnut.2022.1043655

Olaimat, A. N., Shahbaz, H. M., Fatima, N., Munir, S., & Holley, R. A. (2020). Food safety during and after the era of COVID-19 pandemic. *Frontiers in Microbiology*, *11*(August). https://doi.org/10.3389/fmicb.2020.01854

Pernando, A. (2020). *Survei MarkPlus: Tren Belanja Berubah, Produsen FMGC Diminta Fokus Ketersedian*. https://ekonomi.bisnis.com/read/20200519/12/1242718/survei-markplus-tren-belanja-berubah-produsen-fmgc-diminta-fokus-ketersedian

Post, D. M. (2002). The long and short of food-chain length. *Trends in Ecology & Evolution*, *17*(6), 269–277. https://doi.org/10.1016/S0169-5347(02)02455-2

Prakoso, D. (2021). Aspek Pengolahan Makanan di Restoran/Rumah Makan Pada Masa Pandemi. *Kapita Selekta Pariwisata*, *1*.

Prasetya, T. A. E., Mamun, A. Al, Rosanti, E., Rahmania, A., Ahmad, M., Ma'rifah, S., Arifah, D. A., & Maruf, K. (2022). The effects of COVID-19 pandemic on food safety between Indonesia and Bangladesh: A comparative study. *Heliyon*, *8*(10), e10843. https://doi.org/10.1016/j.heliyon.2022.e10843

Rada, N. (2010). Trade and Food Security Implications from the Indonesian Agriculture Experience. *Agriculture*, *10*(1), 1. http://books.google.com/books?hl=en&lr=&id=pJEfhU_9VnoC&oi=fnd&pg=PP1&dq=Trade+and+Food+Security+Implications+from+the+Indonesian+Agriculture+Experience&ots=CRUmJwQNVm&sig=GK_lTv1xQBLiVAL5_QN5xGk9-3c

Rangaswamy, E., Nawaz, N., & Changzhuang, Z. (2022). The impact of digital technology on changing consumer behaviours with special reference to the home furnishing sector in Singapore. *Humanities and Social Sciences Communications*, *9*(1). https://doi.org/10.1057/s41599-022-01102-x

Riwayadi, E., & Wulandari, A. (2022). Digital Marketing Strategy Optimazation to Boost Sales Revenue dring Pandemic Covid 19 at PT. SW Indonesia. *The 2nd International Conference on Government Education Management and Tourism (ICoGEMT)+TECH*, *1*(1), 1–9.

Saberina, S., & Aprianti, V. (2022). Analisis Perilaku Pembelian Konsumen terhadap Pangan Organik Saat Pandemi COVID-19 di Indonesia. *Agrikultura*, *33*(1), 1. https://doi.org/10.24198/agrikultura.v33i1.36019

Sholihah, Q., Kuncoro, W., Wahyuni, S., Puni Suwandi, S., & Dwi Feditasari, E. (2020). The analysis of the causes of flood disasters and their impacts in the perspective of environmental law. *IOP Conference Series: Earth and Environmental Science*, *437*(1). https://doi.org/10.1088/1755-1315/437/1/012056

Suharjo, B., Ahmady, M., & Ahmady, M. R. (2016). Indonesian Consumers' Attitudes towards Organic Products. *Advances in Economics and Business*, *4*(3), 132–140. https://doi.org/10.13189/aeb.2016.040303

Suherlan, Y. (2018). Model Balai Pengembangan Kemasan. *Model Balai Pengembangan Kemasan Ramah Lingkungan Untuk Meningkatkan Daya Saing Produk Lokal Umkm Pangan Olahan Menghadapi Pasar Global*, *d*, 290–301.

Suryanto, Gravitiani, E., Daerobi, A., & Susilowati, F. (2020). Crop insurance as farmers adaptation for climate change risk on agriculture in Surakarta residency-Indonesia. *International Journal of Trade and Global Markets*, *13*(2), 251–266. https://doi.org/10.1504/IJTGM.2020.106771

UN. (2021). *UN Food System Summit*. United Nation. https://www.un.org/en/food-systems-summit

Unicef. (2021). *Analysis of the Social and Economic Impacts of COVID-19 on Households and Strategic Policy Recommendations for Indonesia*. United Nations Children's Fund. https://www.unicef.org/indonesia/media/9501/file/Analysis of the Social and Economic Impacts of COVID-19 on Household and Strategic Policy Recommendations for Indonesia.pdf

Vanhonacker, F., Kühne, B., Gellynck, X., Guerrero, L., Hersleth, M., & Verbeke, W. (2013). Innovations in traditional foods: Impact on perceived traditional character and consumer acceptance. *Food Research International*, *54*(2), 1828–1835. https://doi.org/10.1016/j.foodres.2013.10.027

WFP. (2021). *WFP Policy Engagement and Technical Assistance for the National Nutrition Programme for School Children in Indonesia (Progas): Learning, Conclusions and the Way Forward*. World Food Program. https://www.wfp.org/publications/wfp-policy-engagement-and-technical-assistance-national-nutrition-programme-school

Willett, W., Rockström, J., Loken, B., Springmann, M., Lang, T., Vermeulen, S., Garnett, T., Tilman, D., DeClerck, F., Wood, A., Jonell, M., Clark, M., Gordon, L. J., Fanzo, J., Hawkes, C., Zurayk, R., Rivera, J. A., De Vries, W., Majele Sibanda, L., … Murray, C. J. L. (2019). Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. *The Lancet*, *393*(10170), 447–492. https://doi.org/10.1016/S0140-6736(18)31788-4

Yuwono Prianto, Viony Kresna Sumantri, & Yudhasasmita, S. (2020). The Regulation and Protection of Genetically Modified Food. *Sociological Jurisprudence Journal*, *3*(2), 107–111. https://doi.org/10.22225/scj.3.2.1801.107-111

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