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Issues and opportunities of food security post COVID-19: A study based on Indonesian perspective

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Abstract

The COVID-19 pandemic spreads, trade-offs between containing the virus and preventing catastrophic economic and food security problems that disproportionately affect the world's poor and hungry people. On the local, national, continental, and international levels, COVID-19 is having severe multi-sectoral effects. For a nation or state, food security is a crucial problem. Indonesia still has a lot of food-related issues, from manufacturing to distribution issues. Grains still make up the majority of the food consumed in Indonesia; hence the community depends on their supply. For a nation like Indonesia, where many people still rely on agriculture, this is a complicated situation. Food imports were organised since local production cannot satisfy the country's demand for food. Nonetheless, the hazards associated with dependence on food imports make this approach unsuitable for a lengthy duration. Speaking of the post-Covid-19 pandemic challenges to food security, Indonesia's heavy reliance on rice, traditional agricultural issues, supporting regulation, and education are thought to be the primary issues. Despite these difficulties, possibilities for food security did, however, also emerge. Examples include growing public awareness of food waste, strong social capital, and the promise of returning to local communities to support the food security agenda. Many people have come to understand that food security concerns are significant and require more attention as a result of the pandemic, particularly with regard to how the four primary criteria of food security may be addressed both during and after the pandemic.

Keywords: Food security, COVID-19, pandemic, Indonesia, agriculture

1. Introduction

The COVID-19 pandemic could cause more than a quarter of a billion people to experience severe hunger by the end of the year. If quick action is not done to guarantee that food supply systems remain operational. The introduction of the new coronavirus has made an already formidable worldwide problem worse. More than 820 million people were hungry before to the epidemic, 110 million of whom experienced severe food insecurity.

The majority of the world's poorest and most food insecure inhabitants are about 80% works in small-scale agriculture and reside in isolated rural areas. They are unable to access markets due to restrictions on commerce and movement, endangering both their lives and means of subsistence. The virus poses the greatest threat to the informal commerce networks and agricultural systems that people depend on for existence in nations throughout Africa and the Middle East.

Losses of assets and income that limit the ability to purchase food are the main ways that COVID-19 undermines access to food. Because they have little access to financial markets and spend over 70% of their income on food, the poorest households' food security is particularly susceptible to economic shocks (Laborde *et al*., 2020) [28]. Global economic predictions have grown more dismal as the financial repercussions of social exclusion have become more obvious. The International Monetary Fund (IMF) anticipates a 5% decrease in the global economy in 2020. Millions of people worldwide are at risk for their food security and nutrition due to the COVID-19 pandemic, a health and humanitarian calamity.

The globe before the virus struck, hundreds of millions of people were already starving and malnourished, and unless fast action is taken, we could witness a global food emergency. Without widespread, coordinated action, the long-term repercussions of COVID-19, its accompanying mitigation measures, and the impending global recession could undermine the operation of food systems. Such a disruption may have far-reaching effects on nutrition and health that haven't been witnessed in more than 50 years.

2. Literature Review

Reactive and proactive strategies are required to address the pandemic-related crisis in food security (Xu *et al*., 2021) [46]. Existing connections and short-term supply chains have been quickly used in the short term (Dombroski *et al*., 2020) [12]. Most nations have social security measures that support underprivileged families and guarantee sufficient work possibilities (Kent *et al*., 2020: Nechifor *et al*., 2021) [23, 34]. Some nations have put in place seed safety interventions to support agricultural production (Sperling, 2020) [40]. Food

distribution schemes that supply agricultural items to consumers help lessen the economic and health crises experienced by the most disadvantaged individuals (Jiang *et al*., 2021) [22].

The blockage is a divisive remedy. Although it is successful in containing the epidemic, it comes at a significant financial cost and poses a number of difficulties in terms of food supply, distribution, and transportation (Avtar *et al*., 2021) [5]. Socially isolating policies in metropolitan areas decrease employment and income, making it difficult for the poorest residents to pay their rent and buy food (Stiegler & Bouchard, 2020) [42]. The market's closure led to a dramatic rise in food costs (Akter, 2020) [2], which disproportionately impacted the urban poor and highlighted inequality (Kumar *et al*., 2021) [27]. Most kids in low- and middle-income countries are unable to receive meals due to prolonged school closures, which may result in a decrease in student nutritional intake and family food safety (Kinsey *et al*., 2020: Laska *et al*., 2020: Mayurasakorn *et al*., 2020) [25, 29, 32]. The blockade's detrimental and unequal consequences on the economy and food security could indicate that it is ultimately unsustainable (Quaife *et al*., 2020) [37].

The global supply chain has been interrupted by temporary trade protectionist measures, which have also had a negative impact on the food security of import-dependent nations (Koppenberg *et al*., 2021) [26]. Several nations have banned agricultural exports, despite calls from international organisations, governments, and trade economists to avoid trade protectionist measures to stop food prices from rising. The combined impact of movement limitations and border closures raises food loss and export costs (Pulighe & Lupia, 2020) [36].

Long-term development of new sustainable agricultural policies may be influenced by the lessons learnt during the COVID-19 disaster. A resilient food system is deemed necessary by researchers in general (Khanna, 2020) [24]. Humanely executed rules that are suited to local situations must be developed in order to address the issue of pandemic response (Yaya *et al*., 2020) [47]. Careful planning and control are necessary for management, decision-making, communication, COVID-19 implementation, and the evaluation of the effectiveness of new and existing measures.

Our current efforts to address the food and nutritional insecurity crisis are still insufficient due to a coordination gap and time lag (Carvalho *et al*., 2021: Gurgel *et al*., 2020) [8, 17]. Indonesia should consider the severity of the issue when developing policies and initiatives (Liverpool *et al*., 2021) [30]. Country should make intelligent decisions by safeguarding the food supply chain, avoiding export restrictions, and employing food storage sensibly (Deaton *et al*., 2020) [9].

3. Effect of COVID-19 on Indonesia

In March 2020, the Indonesian government reported the first Covid-19 case in the nation. Even though Indonesia's official response to Covid-19 was slower than that of its neighbours, it persisted in trying to contain it. First concerns about Covid-19 included the fact that the relevant parties were not very alarmed about how quickly the virus would spread and how it would affect Indonesian society. This hypothesis was supported by the observation that the virus appeared to spread more quickly in some colder (non-tropical) countries than in warmer ones (Jahangiri *et al*., 2020) [21]. As a warm country, Indonesia was thought to be less susceptible to the virus's negative effects. Unfortunately, the reality was different, with the virus spreading quickly and government response times being viewed as cumbersome. The sensitivity and specificity analyses of ambient temperature and population size on the transmission rate of the novel coronavirus (COVID-19) in different provinces of Iran.

The Covid-19 pandemic's first wave showed that the government and its citizens were unprepared; the virus spread quickly across the nation. Many steps have been taken to deal with the virus, but they don't seem to be enough to stop the spread (Sun *et al*., 2020) [43]. Without any planning, Covid-19 requires particular measures (Harapan *et al*., 2020) [18]. Although essential for establishing the proper pandemic defences, the prognosis of the virus's evolution was equally sluggish (Tuli *et al*., 2020) [44].

In the meantime, other nations put themselves under a complete lockdown to stop the virus from spreading (Mandal and Pal, 2020) [31]. Because to its economic problems, Indonesia did not implement the system, as lockdown was thought to have catastrophic implications on the economy (Djalante *et al*., 2020) [10]. Indonesia imposed significant social limitations during which only essential activities were permitted in some of the Covid-19 spread hotspots, such as Jakarta.

3.1. Effect of COVID-19 on Indonesian's Life

As of the middle of 2021, the number of Covid-19 cases in Indonesia was still rising. According to the government, Indonesians must adjust to and live with the Covid-19 virus because it will always exist. Even though many people have already received vaccinations, authorities advise people to exercise caution.

The number of infected cases in Indonesia was dispersed over the entire nation. On April 3, 2021, there were around 15 lakhs Covid-19 infections in Indonesia, 13 lakhs recoveries, and approximately 40,000 fatalities. The vaccination campaign was regulated with a target population of 18 crore in order to combat the pandemic. According to priority groups like the elderly, public servants, health care providers, and educators, the initiative was being implemented gradually (National Council for Covid-19 Handing and Economic Recovery, 2021).

4. State of Global Food Security

According to the Committee on World Food Security of the United Nations, food security is the state in which all people, at all times, have physical, social, and economic access to enough, safe, and nourishing food that satisfies their dietary needs and food preferences for an active and healthy life.

Climate change, population growth, rising food prices, and environmental stresses will all have major but unknowable effects on food security during the ensuing decades. The world urgently needs adaptation techniques and policy solutions that address choices for managing water allocation, land use patterns, commerce in food, postharvest food processing, and food costs and safety. Building

resilience to shocks, analysing cash transfers, promoting sustainable agricultural technologies, and managing trade-offs in food security are all part of IFPRI's work on food security. One such trade-off is weighing the nutritional value of meat against the environmental costs associated with its production (IFPRI, n.d.)

Due in part to the COVID-19 pandemic's long-lasting consequences on global food security, 660 million people may still go hungry in 2030 - 30 million more than in a scenario in which the pandemic had not occurred. To put that number into perspective, in 2030, there may be nearly twice as many hungry people in the world as there are now in the United States or three times as many in Brazil.

Hunger will not be eliminated by 2030 unless aggressive measures are implemented to speed progress, particularly measures to address significant causes of food insecurity and malnutrition as well as the inequities influencing the availability to food for millions of people (Food and Agriculture Organization of the United Nations, n.d.) [15].

4.1. Indonesia's Food Security

In 2020, Indonesia will have a population of over 269.8 million, making it the fourth most populated nation in the planet. Countries with a large population face the same problem with food security. The availability of food will be threatened by population growth if the land area is not expanded. The figure 1 demonstrates that Indonesia experienced positive population growth beginning in 1961. The country has experienced tremendous population growth during the past ten years, according to census data. In 1971, population growth was 2.1%; in 2020, it will be 1.25%. The entire population is growing pretty rapidly even though the rate of population increase is declining. More people imply that more food is required. Java has developed into the population's hub as the focus for rice cultivation. Research reveals that Java Island is home to 56.10% of the total population (Statistics Indonesia, 2020a) [41]. As a result of the conversion of land for homes, agricultural land is also declining.

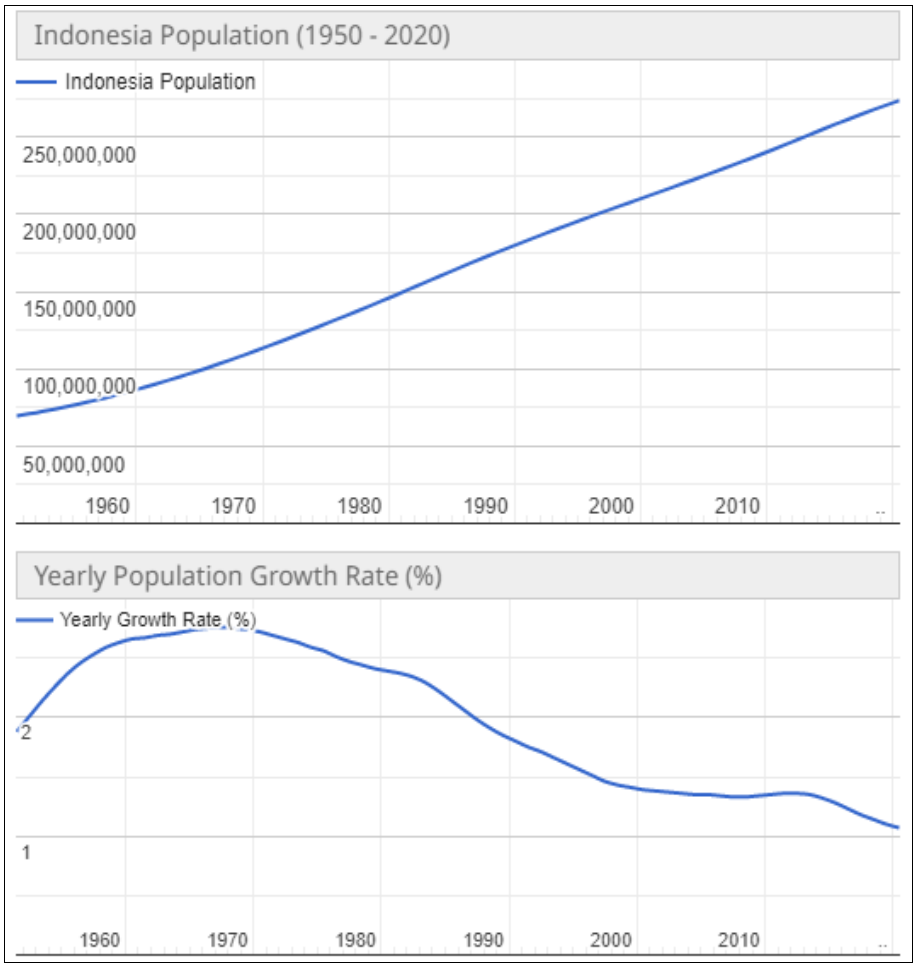

Fig 1: Population of Indonesia from 1950-2020 (worldometer) https://www.worldometers.info/world-population/indonesia-population/

According to Andriani Lubis and Wijaya (2017) [4], the family planning programme frequently targets families in rural areas with a high birth rate. Families who typically only rely on the farm sector, which has unstable incomes, are put in a difficult situation by this issue.

In Indonesia, farmers continue to predominate in the countryside. Miller and Babiarz (2016) [33] demonstrated how the family planning programme affects its target population's socioeconomic well-being (individuals and families). Indonesia has a big duty to maintain agriculture's viability for many farmer families because it is the only country where farming is still the primary source of income for the majority of the population. Small landholdings, a lack of mechanisation, rising costs, a lack of human resources, and poor marketing make farmers' life more precarious; this is especially true when family sizes are large

and there are many mouths to feed. It is difficult in this circumstance to meet the demands of families. Indonesian farmers have two options for ensuring their survival: boosting agricultural income or maintaining family power.

The four main elements of food security are availability, accessibility, stability, and usage of food (Fig. 2). If food security is to be attained, these four requirements must be met. Food availability simply implies that the food is available; whether it is produced locally or abroad, as long as it is available, everything is great. Food accessibility refers to the availability of food, including its affordability and availability in markets or other locations that are easily accessible. Food utilisation is the ability to use food in the right way for nutrition and health.

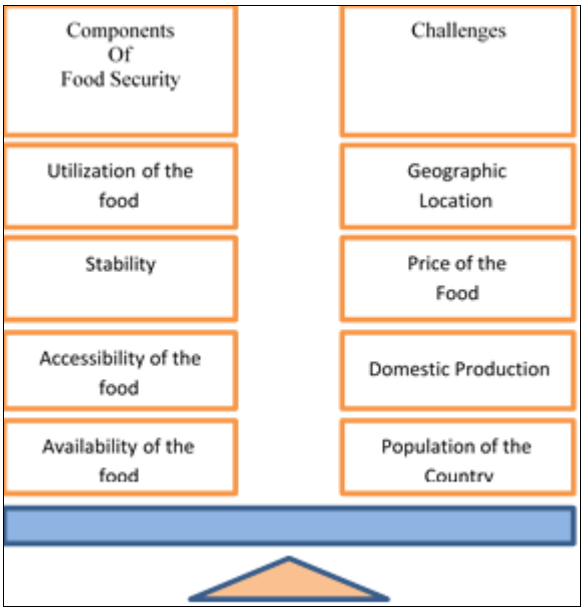

Fig 2: Major elements of Food Security

Calories, poverty, dietary diversity, and a subjective measure are the optimal food security criteria (Headey and Ecker, 2013) [19]. The best-performing class of indicators is dietary variety indicators, which are strong predictors of Sensitive to shocks, economically status and malnutrition (both stunting and wasting), are both reasonably easy to measure. Using data from the 1996 World Food Summit, Greenville *et al.* (2020) [16] claimed that food security is the condition, where everybody has constant physical and financial access to enough wholesome food that satisfies their dietary needs and food choices for an active and healthy life.

Food stability, on the other hand, refers to the ability of all households and/or individuals to always have access to and obtain food. It is possible to say that this stability falls under the availability and accessibility dimensions. All stakeholders must cooperate and contribute in order to attain these food security components.

Yet, achieving food security is not as simple as it may seem; there are several difficulties. These difficulties include a constantly expanding population, a tendency for local production to decline, pricing differences between regions, and geographic difficulties, particularly in Indonesia where many areas are difficult to visit and/or may require additional fees. Price increases of up to double may result from this.

Table 1: Indonesia Food Security Index 2022

Indicators	Values
Affordability	81.4
Availability	50.9
Quality and Safety	56.2
Sustainability and Adaptation	46.3
Overall Score	60.2

Fig 3: Graphical representation of Indonesia food security Index (www.impact.economist.com)

The above figure shows that Indonesia's Food Security Index varies and it exhibits an upward tendency. According to Flood (2010) [14], a new problem in the context of food security challenges arises from the rise in food costs. The rate of food price fluctuation is significant in Indonesia. Government efforts to control prices were frequently insufficient, and efforts to do so are essential for food security (Anderson *et al.*, 2013) [3]. Flood (2010) [14] highlighted that food price increases were already posing a significant issue before the Covid-19 outbreak, particularly with the rise in the number of disadvantaged households. This made families' suffering throughout the epidemic worse. Many middle-class people struggled to make ends meet, while low-income people had it far worse. Farmers also experienced extra difficulties during the pandemic when their harvests were destroyed as a result of insect assaults or other catastrophes (Rozaki *et al.*, 2021) [38].

4.2. Challenges and Opportunities of Food Security in Indonesia Post COVID-19

The information provided above on the Covid-19 pandemic and food security in Indonesia can serve as a foundation for discussing the potential and difficulties facing food security in the wake of the epidemic. The potential and constraints of food security following the Covid-19 epidemic are depicted in table 2. Food security initiatives will continue to face difficulties with regard to the traditional issues in agriculture, such as inputs, human resources, and agricultural land. The parties involved must work together to find solutions to these issues. Long-standing classic issues will require more contemporary or long-lasting solutions than traditional approaches.

Table 2: Challenges & Opportunities Post COVID-19

Challenges	Opportunities
• Major Agricultural Problem • Too much focus on rice • Education to the farmers and consumers • Regulations and Laws	• Awareness regarding wastage of food • Strong social capital • Enhance domestic potential

Rice has a long history of ensuring food security in many nations, including Indonesia. Especially in Asia, this commodity has become essential for ensuring global food security. Regarding food, rice production stability especially in poor nations, security (Bandumula, 2018) [6]. An excessive emphasis on rice will make a nation dependent on rice. When domestic production cannot keep up with demand, this condition is unsustainable and leaves a nation vulnerable. In the meanwhile, there will be volatility in the nation's rice (food) supply if other nations forbid exports.

Indonesia is placing a lot of emphasis on the production of rice (Nurliza *et al*., 2017) [35]. The fact that rice is the primary staple meal in the nation is one of the primary causes. This endeavour is thought to benefit the cause of food security. The economy and stability of the country cannot continue to be dependent on rice. To reduce reliance on rice, food diversification is therefore necessary.

Related parties advocate for legislation that supports farmers as food producers, such as banning the importation of rice during the harvest or other goods that are amenable to self-production. No law impacts the interests of all parties involved in ensuring food security (Douglas, 2009) [13]. This is due to the fact that a wide range of biophysical, political, social, economic, cultural, psychological and behavioural elements have an impact on its control.

The task of education extends to food producers and consumers. For example, using the home garden to grow food to promote food security at the family level, food producers require knowledge to boost productivity and provide valuable food items (Abdoellah *et al*., 2020) [1]. Consumers must also be made aware of food waste and how to properly use food. Ruhyana *et al*. (2020) [39] and Wijaya *et al*. (2020) [45] stated that raising household income and education might increase food security. Opportunities have emerged as a result of the COVID-19 epidemic, including growing public awareness of food waste. This has less to do with environmental concerns and more to do with people's desire to save money.

In Indonesia, social capital that shown compassion for those in need during the epidemic demonstrates that this nation may advance with a community-based initiative to assist its citizens. Djamhuri (2008) [11] demonstrated how Indonesia's robust social capital might support the pandemic-related economic assistance efforts. Diversifying the local food supply is more in line with the possibilities. Instead of forcing those areas to grow rice, it is preferable for them to generate other goods. Women, children, and those who live in poverty experience food insecurity more. Hence, any programme for food security has to pay greater attention to these folks as well Douglas (2009) [13].

5. Conclusion

The COVID-19 problem puts millions of people, many of whom were already struggling, at risk for poor nutrition and food security. A significant worldwide food emergency is approaching. We may experience food system upheavals in the long run, which would have a negative impact on nutrition and health. With coordinated effort, we can not only mitigate some of the worst effects but also facilitate the transition to more sustainable food systems that promote healthy diets and thus better health prospects for all. Indonesia is a developing nation that continues to have difficulty achieving food security. It is difficult to attain the four primary components of food security since there are numerous obstacles to overcome, and the Covid-19 epidemic has only heightened these difficulties.

Despite its reputation as an agricultural nation, Indonesia continues to face challenges related to inputs, land use change, and other well-known agricultural problems. Indonesia should put more effort into increasing agricultural intensification to make better use of its limited acreage, encouraging young people to participate in the industry, and corporate farming to boost farmer incomes. Dependence on imports is more likely to result in future issues. Another problem is that too much emphasis is placed on rice as the primary dietary source. Through rules and actions, the food diversification initiative has to be pushed harder. Together with obstacles, the epidemic has also offered possibilities, such as a greater understanding of food waste, social capital that demonstrates helpful solidarity in times of need, and local power that attracts more attention.

After the Covid-19 epidemic, it will be necessary to set appropriate policies for food security. This requires an understanding of both the lengthy history of agriculture in Indonesia and local features. Lastly, as the food security agenda gets more difficult, cooperation amongst all stakeholders or linked parties is required.

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