

# The Agricultural Sector in Indonesia Amidst COVID-19: Crisis or Opportunity?

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**Abstract.** The proliferation of COVID-19 has led to a decline in commercial operations and economic performance, along with a shrinkage in output. Globally, the agricultural sector appears to be more resilient to pandemic-induced disruptions. This sector tends to have a more stable demand compared to industrial goods. Utilizing datasets spanning from 2013 to 2022, sourced from seven different Indonesian governmental departments, we evaluate the influence of fluctuations in agricultural output on the real Gross Domestic Product (GDP) of Indonesia. Our findings reveal that the impacts are fairly consistently dispersed across all four financial quarters, suggesting that any lockdown measures affecting agriculture could have prolonged ramifications on the country's GDP. Despite its resilience, the agricultural sector faced significant operational hurdles due to production cutbacks, market and border closures, and canceled transactions. Additionally, the financial accessibility for farmers was compromised due to the economic downturn. However, our qualitative analysis indicates that the COVID-19 situation has also unearthed new growth avenues for Indonesia's agriculture. These include the acceleration and broadening of digital transformation, market expansion for exported goods, and an influx of both skilled and unskilled labor. In light of these findings, we put forth five strategic recommendations aimed at ensuring the long-term sustainability of Indonesia's agricultural sector.

## 1 Introduction

COVID-19 has given a devastating blow not just to states' medical systems but has also had a significant influence on their economies. COVID-19's spread has resulted in a drop in commercial and economic activity, and also a reduction in production — almost all global economies have seen a substantial drop in GDP. Indonesia is one of the countries that have been infected by the outbreak. Experiencing the mutual impact of this global issue, Indonesia faced the same situation where the pandemic has a significant impact not only on the economy but in one case the agriculture sector is affected as well. Even though farmers have been stumbling with financial resources. Despite the economic downturn in many business sectors, the agricultural sector is the last sector that can survive. This has proven that the agricultural sector is resilient. The Indonesian government has taken an action to implement

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social restrictions in many sectors as a means to halt the outbreak spread. However, it caused an increasing amount of unemployment. According to Malahayati, Masui, and Anggraeni [1], they detected that the potential sector to absorb this unemployment is the agricultural sector. It is in line with Indonesian plans to secure national food supply and stock. By expanding more land to supply household and government consumption, it is expected no shock in goods and livestock supply. Indonesia's agriculture sector has made a substantial contribution to the country's economic development. Its genuine contribution can be recognized, which has grown in prominence over time. According to Statistics Indonesia, the agriculture sector's contribution to the Indonesian GDP has been continuously increasing from 2019 to 2021 (from 12,71% in 2019 to 13,28% in 2021).

Indonesia's agricultural industry accounts for not only 13,28 % of the country's real GDP, but also 36% of employment and 1,34 % of taxable income. Despite the fact that agriculture exports account for a small percentage of total exports (only 1,83% in 2021), the Indonesian government is working to expand the number of exports (on average a 4% increase per year).

Because of the industry's resistance to economic downturns, there is reason to believe it will be one of the least impacted throughout the worldwide pandemic's fight. Agriculture, being a crucial component of the Indonesian economy's real sector, ensures the country's environmental and food security in a pandemic situation. Many of the Sustainable Development Goals need sustainable agricultural development, hence it is critical to increasing the sector's participation in countries' development policies. However, in the agricultural sector, the dynamic impact of this outbreak compromises the food supply chain, which hampers farmer to access transportation, shipping, processing plant, and financial. Therefore, authors propose six initiatives to ensure Indonesia's agriculture sector's long-term viability.

## **2 Materials and Method**

The researchers do not focus on a specific region in Indonesia, and the data collected constitutes national accumulative data. This research used data such as journals, books, official reports, statistical sources based on domestic agriculture, and other credible media which relevant to the dynamic of the agriculture sector during the pandemic. The data was collected from the fiscal year span 2013-2021. The obtained data is deeply analyzed through the qualitative method and explained the data through words.

## **3 Result and Discussion**

### **3.1 Result**

We found that, since Covid-19, Indonesia took a strict action in expanding the restriction on virus spread. Meanwhile the application which in other side, disrupt a wide range of economic activities, reducing revenue growth and causing layoffs. In fact, this pandemic pushed 49 million people into extreme poverty in 2020. Another impact of disruptions in the food supply chain, for example, could raise the price of certain food commodities. There have been disruptions in the post- farm food supply chain as a result of stricter protocols and social restrictions, as well as transmission risk in downstream food supply such as traditional markets. Covid-19 security situation in Indonesia stand in several condition first, the pandemic implication spread to food security by hampering food distribution, unaffordable cost, and lowering the buying capability of households in rural and urban areas. Second, due to stricter protocols and social restrictions, as well as transmission risk in downstream food distribution such as traditional markets, there have been disruptions in the post-farm food

supply chain. Third, the effect on downstream SMEs (Small Medium Enterprises) have caused in market closures and other mitigation regulations on traditional markets, whereas middle and top consumers migrate to modern supermarkets, which are believed to be safe and secure. Fourth, Effect on the farm sector. Restrictions have had a negative impact on the hotel and restaurant segment, reducing demand for poultry and negatively impacting the corn farm sector. Fifth, unemployment has also increased as a result of the temporary closure of some industries.

We found that the technology used increasing since Covid-19 in all regions in Indonesia. The finding based on collected data primarily showed that smallholder farmers are fully struggling for their market on selling their harvested product. Adhering to the public policy in implementing large scale social restriction give smallholder farmer no option except to obey it. Number of Indonesian smallholder farms in 2021 were 38.8 million, spread in all regions experience mobility restrictions. It means the transportation of oil palm slowed, food crop while demand for biodiesel dropped. This led to the closure of some independent mills. As a result, then economic recession happened to smallholder farmers. Meanwhile, the social restriction which encompasses transportation, lockdown, face to face trade activity hampered smallholder as well.

Following that situation, it is showing a shock phenomenon where farmer society found an alternative way to market their food crop product digitally. Through reviewing and analysis existing data and related literature, the use of digital agriculture during pandemic has been increased. Since this crisis situation-imposed especially smallholder farmer to learn digital agriculture. Digital agriculture seemingly has the ability to assist smallholder farmers and agribusinesses in overcoming a variety of crisis point and pursue the agriculture sector to be more resilient in the future. Since then, the onset of COVID-19, digital agriculture has become a tool for smallholder farmers to strengthen their food crop business. One of the significant digital media smallholder farmers uses is e-commerce. A company is one of the tools that absorb many smallholder farmers to sell their product. Finding a marketplace in current situation has become a pressing concern for smallholder farmer, some of agriculture provider applied simple way to access e-commerce such as using messaging and any other social media platform like Facebook, WhatsApp, twitter to connect buyers and sellers. Technically, smallholder farmers could post their crop harvest and upload it to social media platform, then interested buyers can negotiate the purchase. The researchers evaluate long-term effect of this uptake digital agriculture ability will make the smallholder farmer more resilient to the upcoming shock.

## **3.2 Discussion**

### *3.2.1 COVID-19's effect on global agriculture*

Take a look at how the COVID-19 shock manifests itself in the agricultural products industry. As a starting point, the S-Network ITG Agricultural IndexSM might be employed. This index was created to be a fair, objective, and transparent indicator of the global agriculture industry's performance. Figure 1 depicts the graph for this index, that describes the shock deployment behaviors.

The trend, as depicted in the graph, involves an initial sharp decline followed by a relatively slow rebound. This recovery phase experiences increased fluctuations. Based on this observation, it makes sense to categorize the shock's characteristics into two key metrics: the severity of the drop relative to the period before the shock, and the rate of recovery over a specified duration. In our study, we assessed the performance of the agricultural Exchange-Traded Fund (ETF) using these parameters. We divided the timeline into three distinct phases for our calculations: from July 1, 2019, to January 15, 2020, as the pre-shock stage; from

January 16, 2020, to March 31, 2020, as the shock phase; and from April 1, 2020, to September 22, 2020, as the post-shock stage. We calculated the mean value for the first phase, the minimum value for the second, and again the mean value for the third phase. The percentage decline from the initial to the subsequent metric was employed to quantify the plunge's severity. Similarly, the rate of recovery was calculated using the ratio of the third metric to the first.



**Fig. 1.** S-Net ITG Agriculture Index

While some World Trade Organization members have issued optional declarations and agreements aimed at maintaining and safeguarding sustainable supply routes, as well as reducing or abolishing import duties on essential goods and farm produce, numerous nations have put in place trade restrictions. These limitations are mainly focused on staple food items like sugar, grains, oats, meslin, rice, vegetables, soybeans, sunflower seeds, prepared foods, and oils, with the objective of securing domestic food availability and ensuring food security.

Different jurisdictions have implemented varying and time-bound strategies to safeguard and sustain local food supply chains in the realm of agricultural trade. Indonesia, for example, has faced challenges in its post-harvest food distribution network, prompting policy changes. Specifically, the country's Agriculture Minister lifted the certification prerequisites for importing garlic and onions. Meanwhile, other countries have also made policy adjustments in their agricultural sectors. China has provisionally reduced import tariffs on an array of items, encompassing medical equipment, natural resources, agricultural products, and livestock. Egypt has restricted the export of certain pulses, maintaining a ban on beans and lentils. From April 3 to July 3, 2020, Belarus enacted a temporary export prohibition on essential items like buckwheat, onions, and garlic. Both El Salvador and Honduras have forbidden the export of assorted dried legumes. Kyrgyzstan has placed a temporary export ban on a specific set of food items, including wheat, meslin, wheat flour, edible oils, rice, pasta, chicken eggs, sugar, iodized salt, and various types of animal feed. Thailand has halted the export of chicken eggs, while the Federation of Saint Kitts and Nevis has reduced import tariffs on particular food items, such as vegetables, fruits, fruit beverages, and vitamin supplements.

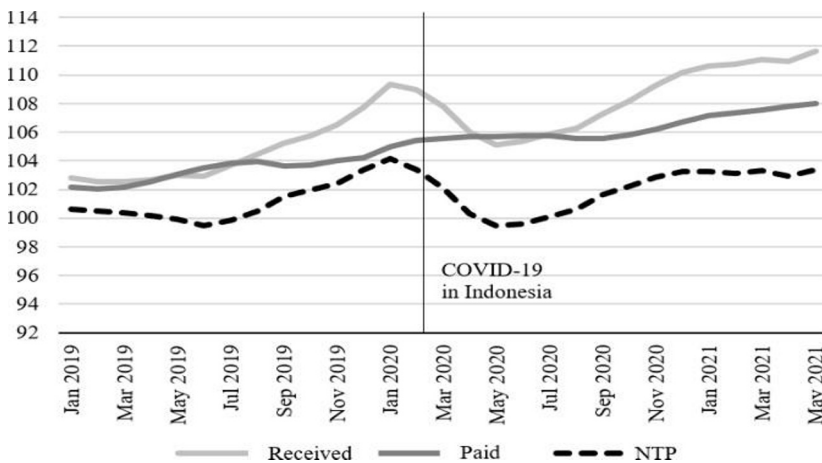
On April 21, 2020, Agriculture Ministers from the G20 nations, Indonesia included, endorsed a collective statement addressing the COVID-19 crisis. They are committed to sustaining transparent and reliable trade in agricultural goods. They also emphasized that any export limitations should align with World Trade Organization guidelines, being "focused, justifiable, clear, and temporary" [2]. Elleby [3] underscores the pandemic's wide-ranging effects, which most nations confront. These include a decline in global meat prices, a significant drop in biofuel costs, reductions in food reserves, local income losses, rising unemployment rates, threats to worldwide food security, and finally, changes in the demand

for agricultural commodities. Researchers from diverse nations have explored the pandemic's influence on agricultural output and the sector at large. Notable contributions include works by Barichello [4] in Canada, Murdad et al [5] in Malaysia, Sapbamrer et al [6] in Thailand, and Ribeiro-Silva et al [7] in Brazil.

### 3.2.2 Agricultural production in Indonesia during a pandemic

The situation in Indonesia is quite similar from the situation in other countries, since the cause of the crisis is COVID-19 and the steps to combat it, and the other cause of the crisis in Indonesia is agricultural systemic issues: capital, the increasingly limited amount of land, many agricultural technologies are not yet modern, the problem of fluctuations in fertilizer prices, the lack of ability to penetrate the market widely abroad and domestically in hard-to-reach areas, and the problem of the low quantity and quality of Indonesian agricultural products compared to the demand from the consumer. As a result, it wouldn't be enough for Indonesia, like some other countries, to just provide business support; it is also necessary to promote macroeconomic stability.

Small and mid-farmers have suffered the largest losses in several cases. The supermarkets, restaurants, and cafés with whom they collaborated closed from the beginning of 2020 until the middle of 2021, thereby destroying the opportunity for certain farmers to sell their products. All of the food would have to come from local markets and online marketplaces. In fact, many small and medium-sized farmers rely only on supermarkets, restaurants, and cafes to sell their products. They've lost their market and must now focus on local markets. The result will be a significant rise in competition in local markets, putting the food supply chain in the area in danger. Small and medium-sized farmers, on the other hand, are still unable to adapt to digitalization in order to promote their products. This resulted in difficulties with the selling of cultivated items, depriving consumers of food supplies and putting small farmers and peasants in a financial bind. Furthermore, the rising cost of the agricultural inputs that farmers require exacerbates their predicament. Furthermore, the farmers were forced to sell their produce at lower prices to the middleman than those established by the state. This has led to the bartering of relationships in rural communities, which is one of the indications of an industry crisis. Current situation caused a threat to Indonesian food security which bring small agriculture collapse, triggered social tension, and instigate high price food crop in supply chain.



**Fig. 2.** Farmers Terms of Trade  
Source: [8]

Figure 2 above showed that, since agricultural activities do not pose a high threat of COVID-19 transmission, the farm sector still encounters several risks. A full stock of food supply may cause decreased demand and lower the price for certain sectors like farms. The restriction policy had brought hotels and restaurants in decreasing its demand for poultry and other farm sectors. Since relaxed import policy in agriculture sectors such as sugar and onion applied, this put farmers in strict condition where price become lower. Furthermore, it has seen a recorded deflation on volatile food in the early outbreak spread in March 2020. The deflation went down every month, but out of span June until October it reached in December 2020 up to 2,2% MTM. Other commodities like shallots, eggs, chicken meat, and bird's eye chili gradually increased in November 2020 [9]. The increase in food prices in the second half of 2020 contributed to recovery buying power on the consumer side and heavy rainfall on the supply side. At the meantime, in March 2021 the farmers' terms of trade indicated high at 102.9 and steady.

The pandemic has wreaked havoc on the country's economy, and as a result, agricultural investment is plummeting. Whether or not there is a Covid-19 pandemic, agricultural investment is confronted with traditional issues that affect investors' willingness to commit capital, particularly in medium and small-scale firms. (1) finance and capital, (2) investor interests, (3) tariff and non-tariff barriers, (4) infrastructures, (5) low product competitiveness, and (6) ease of licensing and bureaucracy are all issues that must be addressed [10].

Domestic Investment accounted for a large rise in investments in the agricultural industry between 2015 and 2019. This may be seen in the quantity of Domestic Investment in 2015, which was US\$ 862 million, which climbed to US\$ 2 billion in 2018, then to US\$ 3 billion in 2019, before decreasing to US\$ 2.2 billion in 2020.

In 2015, foreign investment in the agriculture sector was US\$ 2 billion, while it will total US\$ 1.1 billion by 2020. When comparing the Plantation sub-sector to the Food Crops, Horticulture, and Livestock sub-sector, the realization of agricultural investment, both local and foreign investment, seems to be more concentrated on the Plantation sub-sector. Plantation sub-sector realized 95.51% of investment from domestic and foreign investment from 2015 to 2019, while Food Crops sub-sector 0.26%, Horticulture 0.16%, and Livestock 0.16% [11].

Should the combined impact of both new and existing adverse elements intensify—such as the declining financial health of businesses, reduced investments in agro-industrial initiatives, and the global economic downturn caused by the COVID-19 crisis—it's anticipated that investment could surge by 20%, reaching a total of up to \$5 billion. This would be aimed at expanding both agricultural production and preparatory activities. Agriculture is a cornerstone of the nation's economy, generally contributing about 13% to Indonesia's total Gross National Product and providing employment to 36% of its populace. Notwithstanding this, the sector's exports made up a mere 1.83% of the country's total export revenue in 2021.

When the pandemic initially struck in 2020, the growth rate of agricultural production saw a decline, dropping from 3.6% in the previous year to just 1.7% [12]. The most significant dip was witnessed in soybean output, which shrank by 31% compared to the same timeframe the year before, totaling 291 thousand tons. In contrast, corn production exhibited a marginal increase of 0.1%, reaching 22.92 million tons. Some crops like chili and onion experienced a favorable uptick in production, surging by 10% to 4.6 million tons. However, sugarcane output contracted by 4%, totaling 2.13 million tons. Rice, a staple agricultural commodity, also saw a minimal increase of 0.1%, amounting to 54.65 million tons.

In 2021, the total yield of key livestock products was 3.9 million tons, a 5% reduction compared to the same period in 2019. Poultry meat took the lead in livestock production, with a total output of 3.4 million tons, which is a slight 2% decrease from 2019 levels. On

the other hand, red meat production, specifically beef, declined significantly by 13%, totaling 437 thousand tons compared to the same period in 2019. This data indicates that while poultry production has managed to stabilize and show signs of recovery, the red meat sector continues to struggle, experiencing a substantial downturn [13].

In the scope of oils, Indonesia is known as the biggest exporter of palm oil in the world. This is a huge opportunity for Indonesia, because palm oil's versatility has made it one of the most widely used oils in food and non-food goods around the world [14]. Even though the production in 2021 decreased by 4% than in 2020 to 47 million tons. On the other hand, export number of palm oil in 2021 increased in a small number, 0.6% than in 2020 (34 million tons), that is 34.2 million tons. Then, another kind of oil is coconut oil, whose produced amounted to 2.8 million tons, which is a similar number than in the corresponding period of 2020.






The COVID-19 crisis acted as a catalyst for Indonesia's Ministry of National Development Planning to compile its third Voluntary National Review (VNR) focusing on the execution of the Sustainable Development Goals (SDGs) within the country. This review was officially submitted to the United Nations' High-Level Political Forum on Sustainable Development on July 15, 2021. The central theme for the 2021 VNR report was "Building Resilience and Sustainability in the Wake of the COVID-19 Pandemic for the Agenda 2030." The report primarily delves into nine key goals: Goal 1 (Eradicating Poverty), Goal 2 (Eliminating Hunger), Goal 3 (Promoting Health and Well-being), Goal 8 (Fostering Decent Work and Economic Expansion), Goal 10 (Minimizing Inequalities), Goal 12 (Sustainable Consumption and Production), Goal 13 (Addressing Climate Change), Goal 16 (Ensuring Peace, Justice, and Strong Institutions), and Goal 17 (Fostering Global Partnerships to Achieve Objectives). Nevertheless, several challenges persist in the actualization of these SDGs, especially in the Indonesian context. These challenges include (a) budgetary limitations, (b) the quality of intangible infrastructure, (c) sluggish development in technology adoption, (d) labor market integration, capital investment, and value addition in the industrial domain, and (e) enhancing product competitiveness and export diversification through innovation [15].

### *3.2.3 Indonesian food security during the pandemic*

Indonesian government still experience challenges in strengthening and developing agriculture sector. COVID-19 hit all sectors, and some were seemingly worse than others. Despite, considered as one of the most resilient sectors, Agriculture is still vulnerable. It became worse when the government applied social restrictions. Most societies find it difficult to provide household food stock. Meanwhile, the outbreak transmission according to the government experts can be cut out through avoiding mass crowd. Practically, supermarkets, traditional markets, hotels, and restaurant temporarily closed. Even the government and citizens were not ready with this situation, but countries have been affected by the virus rapidly [16]. Therefore, many countries implemented total lockdown as prevention to halt the virus spread [17]. Due to social or activity restrictions as a short-term measure, the tense among government and citizens arose. It caused a conflictual decision that is always be questioned for how long lockdown would be lasted. Mirroring to developed countries cannot predict precisely the future condition and situation of this COVID-19 [18].

Global food security is an instrument to measure food resilient in countries. The measurement encompasses availability, affordability, quality, and safety. Researchers conduct further reviewing on Indonesian global food security with total of all categories in span of time 2015-2021. Indonesian Global Food Security Index (GFSI) in 2015 reached global rank at 74th with score 46.7 [19] and it increased to 50.6 with global rank at 71st in 2016 [20]. In 2017, Indonesian GFSI showed an improvement at 69th global rank with score

51.3 [21], the result of GFSI overall ranking put Indonesia in the 65th with score 54.8 [22], and in 2019-2020, Economist Intelligence Unit [22] reported Indonesian GFSI at 62nd with score 62.6, a regression has seen in the global rank went down to 65th with score 59.5 in 2020 and gradually fell down to 69th with overall score 59.2 in 2021.

Series	Score bar chart	Score	$\Delta$	Rank	$\Delta$	Average score (all countries)	Indonesia compared to average
<b>OVERALL FOOD SECURITY ENVIRONMENT</b>		59,2	-2,2	69	▼12	60,9	-1,7
1) AFFORDABILITY		74,9	-4,1	54	▼4	66,8	+8,1
2) AVAILABILITY		63,7	-2,0	37	▼9	56,7	+7,0
3) QUALITY AND SAFETY		48,5	-1,0	95	▼4	68,0	-19,5
4) NATURAL RESOURCES & RESILIENCE		33,0	-0,1	113	↔	50,8	-17,8

**Fig. 3.** Data comparison Indonesian GFSI in the span of time 2020-2021.

Source: [23]

The above-mentioned data indicated some regression, based on global food security measurement. Affordability from fiscal year 2020 reached 79.0, but in 2021 it went down at 74.9, having minus 4.1. Meanwhile the availability of food chain in fiscal year 2020 was at 65,7 and 63,7 in fiscal year 2021. The global rank predicate gradually dropped along temporal social restriction policy. The sense of the food supply crisis at that time was more clearly impacted to smallholder farmers. They find it a dilemma when Terms of Trade (NTP) were lower than out cash expenditure. Following the lockdown, smallholder farmers hardly to make market for their product. Undoubtedly, this restriction is significantly affecting their economy. Supermarkets or even traditional markets are not allowed to run, even if they still open, seem hard for lower middle income to purchase with current situation.

### 3.2.4 Opportunities for Indonesia's agriculture sector

COVID-19 has exposed vulnerabilities beyond just the agricultural sector. Due to the pandemic, farmers have been forced to explore new methods for production, marketing, and administration. The adoption of modern technologies has become crucial in this context. The pandemic has accelerated the digitalization process, rendering digital solutions not just desirable but essential [24]. By 2020, the agricultural sector had already begun enhancing its digital presence in both marketing and production. This includes selling products on social media, adopting precision agriculture 4.0 (a key government initiative aimed at boosting farmers' productivity and market reach), and in many instances, leveraging technology to make agricultural processes more efficient (e.g., automation, robotics, drones, satellites, artificial intelligence, and the Internet of Things) [25]. During the pandemic, one of the primary areas of vulnerability was consumer access via regulated marketplaces. The urgency to digitize marketing strategies became apparent. Farmers started to establish online stores and market their products through social media platforms. While this practice is still in its nascent stages in Indonesia, it shows considerable promise. The country's rapidly growing



startup ecosystem suggests a bright future for digital agriculture. Contactless transactions and the use of technology, such as IoT sensors for crop monitoring, not only enhance a firm's risk management but also assist smallholder farmers [26].

Another area witnessing active digitalization is management procedures, particularly in large agricultural estates. Movement restrictions during the pandemic have pushed managers to revise their strategies. The digitalization of these management processes has led to cost reductions and time savings.

In light of the pandemic, many governments are reevaluating their approaches to food security. Efforts are underway to bolster domestic production of agricultural products, especially those that have traditionally been exported. For Indonesia, being both an exporter and importer of agricultural goods creates favorable conditions. It offers opportunities to expand markets, introduce new products internationally, and promote not just raw agricultural products but also value-added commodities. Additionally, this could help Indonesia reduce its dependence on imported staples like rice and soybeans [27].

Many people have had to reevaluate their ideas on everyday spending, health, and diet as a result of the coronavirus pandemic. Many individuals nowadays are concerned about consuming ecologically friendly items, seek confirmation more attentively, and proactively approach quality and safety criteria. People are worried more about what things people buy and how healthy they are as a result of the growing mindful consumption culture. Fresh, natural, and always safe products in a secure package are required. Food producers who recognize these market demands and adapt their output to meet them might win major competitive advantages. After all, eating well is becoming increasingly vital.

One of the positive developments related to the coronavirus pandemic in Indonesia is the return of individuals, both skilled and unskilled, who can engage in seasonal agricultural work and help alleviate the usual labor shortages on farms. This has been prompted by widespread layoffs in urban areas, which have led many workers to return to their villages and take up farming.

## **4 Conclusion**

The catastrophe created by the COVID-19 pandemic is one of the most pressing issues confronting Indonesia's agricultural sector recently. However, agricultural challenges are more caused by systemic macroeconomic problems, particularly the lack of a real agricultural development strategy in the country.

To preserve agriculture's long-term viability, we believe the following actions are required:

1. The Ministry of Agrarian Affairs and Spatial Planning/National Land Agency should make more sustainable agricultural lands in order to fulfil the national food sovereignty based on the Ministerial Regulation 19 of 2016 Determination of Agricultural Land [28]. Sustainable food agricultural land or what is often abbreviated as LP2B is a field of agricultural land that is determined to be protected and developed consistently in order to produce staple food for national food self-reliance, security and sovereignty [29]. Because, about 1 billion people in the world will experience hunger if food production is not increased by 3 times in the period 2000- 2050 [30] And the priority task of the ministry should be to maintain agricultural lands from conversion to non-agricultural lands.
2. Small and medium-scale farmers should have access to low-cost medium- and long-term financing. Without investment, the agricultural sector will not be able to develop. Today, farmers already have access to loans such as people's business credit (KUR) and micro credit from the state's bank. But still, there are only few socializations and counselling from the government to the farmer [31]. So that, there are still many cases

- that farmers have to lend from moneylender with big interest [32]. It is vital to provide advantageous economic circumstances for farmers in terms of improving production processes, developing a new farm, and digitalizing the agricultural industry.
3. Indonesia's agricultural sector should be integrated and strengthened with global agriculture. To compete effectively in international markets, Indonesia's agriculture sector must first achieve the Association of Southeast Asian Nations (ASEAN) and international quality requirements, as well as receive the relevant ASEAN quality certificates for its own products. Because according to the Ministry of Investment of the Republic of Indonesia has stated, Indonesia shall become a world food barn in 2045 [33]. Moreover, the West Java province and surroundings (one of the provinces in Indonesia that contribute much for agricultural sector) is one of the most fertile lands in the world [34]. By raising product pricing, will dramatically expand markets and enhance cash exports. It is vital to transition from raw material exports to finished product exports.
  4. Improve agribusiness fiscal policies. Agriculture enterprises with political protectionism and financial overcapacity, as well as medium and small farms, should not be subjected to the same tax burden. The state should give priority to small enterprises. In the agriculture industry, it is vital to optimize the taxation and government assistance models.
  5. Upgrade the agricultural sector's management system. The initial step involves streamlining the administrative structure and initiating the digital transition. This would encompass making information easily accessible, unlocking databases like the land bank, and facilitating remote accessibility, among other initiatives. With timely and readily available information, farmers will be better equipped to manage their operations and quickly adapt to shifts.

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