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The economic well-being of smallholders and challenges during COVID-19 pandemic: A review

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Abstract: The challenges smallholders face in agricultural management between developed and developing countries differ and can also impact the smallholder's well-being. The purpose of this study is to identify factors that affect the well-being of smallholders. We conducted a systematic literature by applying the Preferred Reported Item for Systematic Review and Meta-Analysis (PRISMA) and extracted 30 articles from Scopus and Web of Science. These articles show three main factors that drive well-being: technology, optimal resource, and insurance, and two additional factors: market pricing and tax policy. Findings show that all the above factors will first impact economic well-being and, subsequently, social well-being. When COVID-19 struck, the smallholder's well-being was also affected in addition to the destabilised food chain. Travel restrictions have led to a labour shortage. The smallholders had to turn to e-commerce to sell their products. They also incurred losses and experienced difficulties in procuring agricultural intermediate inputs. The absence of agricultural insurance worsened the impact on the well-being of the smallholders. To safeguard the well-being of these smallholders, the study suggests that stakeholders should encourage local labour participation, increase investment in human capital, adopt e-commerce in marketing, offer agricultural insurance schemes against various disasters and continuously provide or increase subsidies to smallholders.

Keywords: developed countries; developing countries; impact; systematic literature review

The agricultural sector is a primary economic sector vital for a country and the world. Its importance and role are not limited to the developing countries alone, but the developed countries as well. In addition to being the guarantor of food security, this sector is also the supplier of raw materials to the industries involved. It even acts as the generator of employment that contributes to economic growth and the gross domestic product (GDP) of a country and, ultimately, the world (Al Salmi et al. 2020; Giller 2020; Zhong et al. 2020). According to the World Bank (2022), agriculture contributes about 4% to the world's GDP. Meanwhile, in particular developing countries, agriculture contributed more than 25% to their GDPs.

The challenges in the role of the agricultural sector differ between developed and developing countries. In developing countries, the challenge of the agricultural sector is focused on the welfare of the country's population (Ma et al. 2021). When food security is low, the country's people cannot access safe and nutritious

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food to meet their dietary needs and enjoy an active and healthy life (Staatz et al. 2009). Besides that, developing countries' agricultural sectors are also an essential source of income and provide employment opportunities for the locals (Fani et al. 2021). For example, Malaysia's agricultural sector, especially oil palm, is the primary source of income and employment for some locals. The job opportunities focus not only on the plantations alone but also include processing downstream goods that would eventually be exported abroad. As such, if a nation's agricultural sector is confronted with challenges, the population's well-being will be affected (Tambi et al. 2021).

In comparison to developing countries, the challenges in the developed countries agricultural sectors are more related to the demand and supply of agricultural products, the impact of technological progress on output and prices, the relationship between domestic agriculture and international trade, as well as farms' income (Say et al. 2018; Qiang et al. 2019). In developed countries, an oversupply of agricultural goods causes price pressure. Industrial consolidation also occurred and helped to create economies of scale that reduced the production cost of goods. Besides, there is also dependence on subsidies and an increase in the poverty gap between urban and rural residents in certain developed countries. Therefore, to overcome the imbalance between the demand and supply of agricultural products, the government must manage the demand and supply in a well-organised manner. However, a study must first consider the benefits and drawbacks. The next challenge arises when technological advances in the agricultural sector are not attained or utilised fully (Say et al. 2018). This is because some developed countries still develop high-tech machines and tools to manage their farms, albeit the plantations have been cultivated for quite some time (Nowak 2021).

Agricultural management became more challenging in developing and developed countries when the COVID-19 pandemic hit. It first appeared in Wuhan, China, in December 2019 and started to spread and impact the economic and agricultural structures almost worldwide (Okolie and Ogundeji 2022). The pandemic significantly affected and challenged the agricultural sector, destabilising the food chain. According to Grigorescu et al. (2022) and Mugabe et al. (2022), COVID-19 affected the food chain system of the agricultural sector in three areas.

Impact on agricultural production and income. When the COVID-19 pandemic broke out, many countries issued curfew orders with restrictions on travel, both within and outside the countries. Since the agricultural sector in most developing countries is labour oriented, this sector suffers from a labour shortage. This situation ultimately resulted in the agricultural output not being harvested. In addition, travel restrictions due to COVID-19 also put pressure on storage facilities. It is because agricultural goods are highly perishable. It consequently caused smallholders to suffer losses. Further, the pandemic also affected the intermediate inputs, whereby farmers found it difficult to procure agricultural inputs such as fertilisers and pesticides. These disturbances profoundly impact agricultural production and the farmers' income.

The shift in consumer demand. The food consumption rate outside the home, such as in restaurants, hotels, school canteens and others, declined when the COVID-19 pandemic hit. Food consumption demand shifted towards ready-to-eat meals for easy storage. It was driven by e-commerce. Some manufacturers produce smaller quantities for home use rather than in bulk for deliveries to supermarkets. This shift in demand has put pressure on the food chain. The smallholders are also impacted as they are more likely to send their agricultural produce to markets, supermarkets and restaurants. As a result of the shift in demand, these disruptions have directly challenged the farmers in selling their agricultural products.

Disruption to the food supply chain. The preventive measures in curbing the spread of COVID-19 also disrupted the food supply chain. It was due to delays in transport and logistics services due to border closures and tightened inspection procedures. In addition, there were restrictions on import and export inspection that ultimately affected the availability of agricultural goods. There were also disruptions to airline services because more commercial flights to deliver perishable food products such as fruits and vegetables were needed. Disturbances also occur at the ports. Ports were closed, causing product transport delays from an exporting port to an importing transportation country's port. Subsequently, the restrictions on movement caused container prices to rise. The disruption to the food supply chain affected not only the delivery of food products but also impacted the agricultural inputs for production.

The impact of the pandemic on the agricultural sector can also be seen in farmers, especially those small-scale growers. More than 80% of the world's farms are cultivated by smallholders (Fan and Rue 2020). One of the effects that can be seen is their well-being. Well-being is a combination of good feelings, positive

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experiences such as happiness and satisfaction, having a purpose in doing something and positive relationships (Ruggeri et al. 2020). Nonetheless, according to Coffey et al. (2016), well-being can simply be defined as a positive feeling. Csikszentmihalyi and Seligman (2000) suggested five well-being indicators, namely positive emotions, engagement, relationships, meaning and achievement (PERMA). It is because these indicators could be acquired by humans naturally. Additionally, PERMA is significant and positively related to physical health, job satisfaction, life satisfaction and organisational commitment (Kern et al. 2014).

There are two aspects to measuring well-being, namely subjective (SWB) and objective (OWB) (Alatartseva and Barysheva 2015). Measurements of well-being through SWB and OWB are obtained through questionnaires or interviews. SWB measures human feelings, identifying human genes, universal needs, and economic, social, and natural environments. Meanwhile, OWB is evaluated through measurable data. Usually, OWB measurement is performed to identify the levels of health, employment opportunities, socioeconomics, politics, environment, and security.

According to Bakar et al. (2015), the sustainability of well-being can be achieved through economic and social well-being. It is because these two types of well-being are interdependent. Figure 1 shows the well-being sustainability flow chart introduced by Bakar et al. (2015). The sustainability of well-being applies to humans, that is, people and communities, and the environment encompassing awareness, participation, and lifestyle.

Previous studies have revealed various factors that affect well-being. Therefore, this study tries to identify factors that affect the well-being of smallholders. A systematic literature review (SLR) was used in this study. Unlike previous studies, this study also discusses the impact of the COVID-19 pandemic on smallholders' well-being based on the identified factors.

This study provides insight or a preliminary understanding to other researchers for future studies. In addition, this study also helps formulate policies by the government and non-governmental organisations for smallholders' or other communities' well-being.

MATERIAL AND METHODS

This study used SLR as a method to analyse the objectives of the study. This method identifies, evaluates and summarises research (Mariano et al. 2017). An SLR study uses the PRISMA method in selecting the literature available in research-related databases. According to Petticrew and Roberts (2008), adopting PRISMA as a guide in a study has several benefits, namely *i*) research questions can be clearly defined through a systematic search, *ii*) necessary criteria, appropriate inclusions and exclusions can be identified, and *iii*) multiple literature databases can be promptly and comprehensively examined. All three benefits are supported by Shaffril et al. (2020) and Müller et al. (2020).

Therefore, the study conducted a literature search based on the research question; i.e. what factors affect smallholders' well-being? The research question can

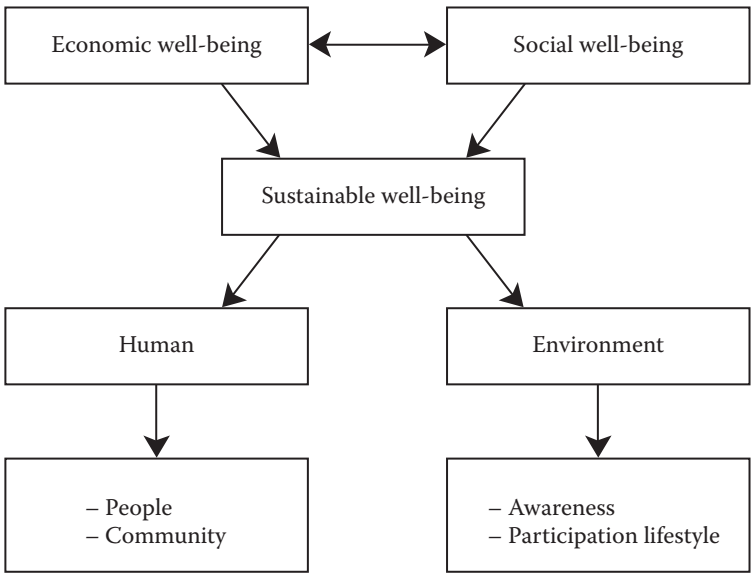

Figure 1. Well-being and sustainability flow chart

Source: Bakar et al. (2015)

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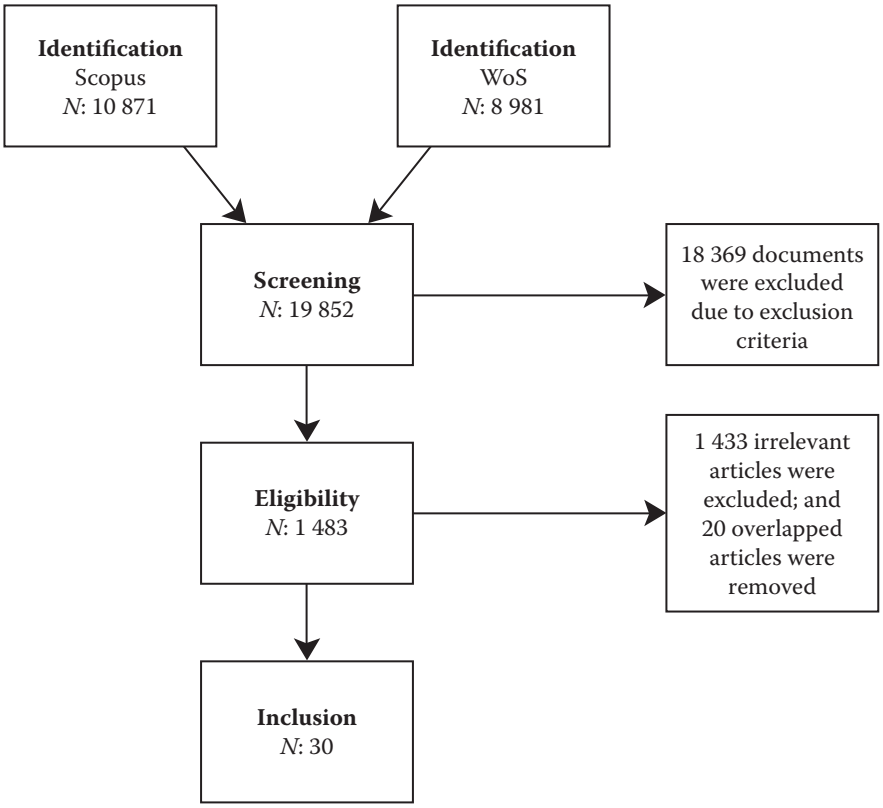

Figure 2. Preferred Reported Item for Systematic Review and Meta-Analysis (PRISMA)

Source: Shaffril et al. (2020) and Müller et al. (2020)

be answered using the PRISMA method. This was done by summarising the previous studies, as shown in Figure 2. Figure 2 shows four steps in PRISMA: identification, screening, eligibility, and inclusion. However, before the literature search using the PRISMA method is carried out, the writer must first identify the keywords. The purpose is to simplify further and streamline database searches. The keywords for the search were a factor, well-being, and smallholder. The keywords were used in the identification phase and series of search strings, as presented in Table 1.

This study only used advanced search techniques compared to other SLR studies used two main search techniques, manual and advanced (Jaber et al. 2022; Falwadiya and Dhingra 2022). It is easier to use advanced search techniques than the manual method because manual search techniques require the identification of relevant past studies through a page-by-page search without a search index in the database. Usually, this search technique utilises the Google Scholars database. Advanced techniques use the phrase search function and the Boolean operators 'OR' and 'AND' to combine the abovementioned keywords. Advanced search techniques can also identify more relevant articles than manual search techniques (Kitchenham et al. 2010). The databases chosen for this study are Scopus and Web of Science (WoS) because they are the most reliable bibliographic data. In fact, they published most of the research analyses and evaluations for the literature (Pranckutė 2021).

Table 1. Symbols and Coding in Scopus and Web of Science (WoS)

Database	Keywords
Scopus	[('Factor*' OR 'Cause*' OR 'Influence*') AND ('Wellbeing' OR 'Well-Being' OR 'Welfare*') AND ('Smallholder*' OR 'Farmer*')]
Web of Science	[('Factor*' OR 'Cause*' OR 'Influence*') AND ('Wellbeing' OR 'Well-Being' OR 'Welfare*') AND ('Smallholder*' OR 'Farmer*')]

Source: Own elaboration

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The first stage of PRISMA is known as the identification stage. At this stage, the researchers were presented with 10 871 and 8 981 documents from the Scopus and WoS databases, respectively. The next stage is screening. At this stage, 19 852 documents had to be screened, and four criteria for this SLR study excluded 18 369 documents. The first criterion was the subject, Economics, Business and Accounting, as the subject's selection determines the research direction of the study. The following criterion was the type of document. Only empirical journal articles were selected; documents such as conference papers, reviews, book chapters, conference reviews and others were excluded. The third criterion was the type of source. The research only included journals as the study's source since they are highly reliable. Besides, they also offer proof of claims in their research results. The last criterion was the Language. The study only selected English articles because, according to Linares-Espinos et al. (2018), language standardisation is crucial to avoid confusion and prevent lengthy and costly investigations.

The third stage was the eligibility stage. This stage involved the removal of overlapping articles from both databases and articles that did not fit the study's objectives. This process was done manually by perusing the titles and abstracts. As a result, 1 433 articles were removed because they were irrelevant and did not focus on smallholders and well-being. At this stage, the study only selected empirical quantitative articles. Then, a total of 20 articles were removed due to overlap. The final stage was inclusion. This stage involved the analysis of past literature that had been selected after the three steps of the PRISMA method. At this stage, 30 studies were selected for analysis.

Research findings. The study first details the factors that affect the well-being of smallholders, as discussed by previous researchers. Three main factors contribute to well-being, namely technology, optimal capital, and insurance. In addition, the other factors are pricing and tax policy. The discussion of each of these factors will be followed by an explanation related to the impact of the COVID-19 pandemic on the well-being of smallholders.

Technology. Improvements in technology lead to a significant increase in the production and quality of output. When there is an increase in output, the smallholders will enjoy higher sales and income. It will ultimately contribute to the well-being of smallholders. The contribution of technology to the well-being of smallholders and their families can be seen in several case studies by past researchers, such as in Nigeria, Uganda, and India. Studies conducted by Audu and Aye (2014) and Awotide et al. (2016) found that the well-being of smallholders cultivating maise and rice in Nigeria increased after their farms adopted the technology. The researcher found that the smallholders' households had prospered due to increased income and formal education. The use of technology is not limited to crop production but could also be employed in commercialised agricultural products. For example, using technology through smartphones could overcome the gender inequality issue in Uganda as agricultural commercialisation activities are often associated with men who are dominant in making decisions about agricultural production and income (Sekabira and Qaim 2017; Adams and Jumpah 2021). Next, the improved agricultural income through technology helps to reduce debt-driven suicide cases in India (Bhukuth et al. 2019).

Studies by Adams and Jumpah (2021), Hadush (2021) and Ruzzante et al. (2021) found that the increased income through technological adoption by the agricultural sector has consequently led to several positive effects. The improvements include social participation, health, business networks, credit access, and land ownership, as well as the increase in the number of family members.

However, the well-being of these smallholders was disturbed by the spread of COVID-19, especially in developing countries. The level of technology in farm management in developing countries is lower than in developed countries (Azadi et al. 2011). In addition, their agriculture is labour-intensive. When COVID-19 hit the world, agricultural activities in developing countries were severely affected.

Curfews were imposed in many countries, restricting domestic and international travel. This was felt in countries that employ foreign labour for agricultural purposes. Labour shortages have led to difficulties harvesting agricultural produce (Olukunle 2013). Although agriculture in developed countries is more capital-intensive, they also experience disruptions in preparing labour inputs for farm activities during COVID-19. For example, there is a labour shortage of 80 000 workers in the United Kingdom (UK) (Ramakumar 2020), and 60 000 of these are seasonal workers who come to the UK each year. This shortage is due to travel restrictions and the local workforce potentially being infected with COVID-19.

Next, the shift in consumer demand put pressure on the smallholders to market their agricultural products. The pressure is not limited to developing countries but also affects developed countries. Previously, the mediums used to sell the products might have been

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limited to markets, supermarkets, and restaurants. Still, during COVID-19, these mediums changed due to the closing of the markets, supermarkets and restaurants to prevent the spread of the pandemic. This significantly disrupted the existing market system and forced the smallholders to seek alternatives. Consequently, they have been forced to transform their selling method through e-commerce to meet consumer demand (Måren et al. 2022). According to Arathoon et al. (2021), digital usage among smallholders has increased during COVID-19. For example, a 60_decibels survey on digital use among 1 954 smallholders in Kenya was held from September to December 2020 (60_decibels 2020). The survey found that during that period, 12% of smallholders from total respondents agreed that digital usage increased significantly in September, then decreased to 8% in October and November but returned to an increase in December of 10% (see Figure 3). Besides using digital platforms in marketing, they also use them for personal agronomic advice. However, this situation is challenging to smallholders in developing and developed countries because about 4 billion people worldwide, mostly in rural areas, do not have access to basic internet connectivity (Graydon and Parks 2020).

In addition, developing and developed countries built advanced technology to face the difficulty of cultivation activities on the farm because of the curfew. There are initiatives for this problem; in China, a software application was built to help smallholders in their agricultural activities. The technology team uses knowledge-graph technology to collect data on the progress and recognition of plant images. This application helps the farmer control water, fertiliser and temperature use through greenhouse automation without coming to the farm. Similarly, in developed countries like Germany, an application that can monitor crops by simply clicking a photo was developed. The application only requires smallholders to understand land deficiency and detect any pest attacks, in addition to showing crop efficiency patterns using machine learning (ML) and the Internet of Things (IoT) principles just by looking at crop photos (Alexander 2020). These kinds of apps can improve the well-being of smallholders. However, the application can only be used efficiently and comprehensively if the area is equipped with high-speed internet.

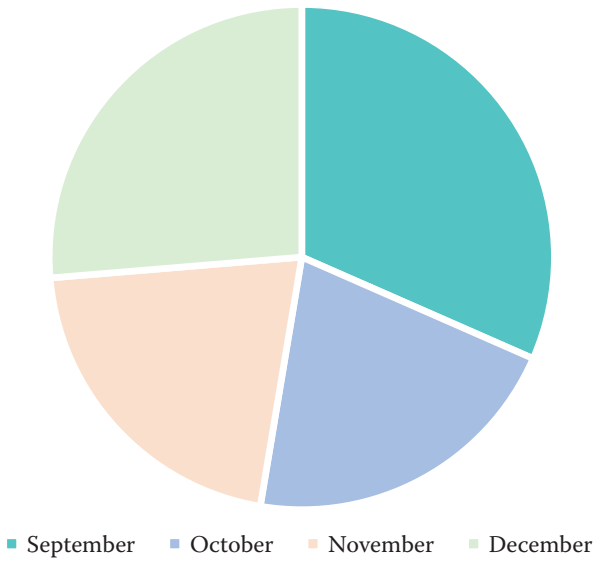

Figure 3. Changes in use of digital technologies by Kenyan smallholders during COVID-19, September to December 2020

Source: 60_decibels (2020)

Optimal resources. It is essential to optimise corporate resources to maximise profits and minimise costs.

Similarly, agricultural production will also increase when there are optimal resources. Previous researchers have used several indicators to identify optimal resources as a well-being factor. Among them are efficient farm management, increased investment in human capital, agricultural inputs, and others.

Studies by Ellen and Miet (2014) and Mariyono (2019) found that efficient management of farm operations will increase income, open up more job opportunities and reduce the poverty rate. This finding is supported by Dhehibi et al. (2018), who states that when land and water management is done efficiently without harming the environment, smallholders' lives are more prosperous. The soil and water for agricultural activities must be well-managed to avoid soil erosion and nutrient degradation. However, deteriorating soil nutrition can be treated through fertilisation. Fertilisation could improve well-being, such as housewives' income, food security, and education (Surahman et al. 2019; Hörner and Wollni 2021). On the other hand, if the farms are not well-managed, smallholders' income will decrease, and there will be a disruption to national food security (Dhehibi 2018).

The next indicator is increasing the investment in human capital. According to Wolz et al. (2010) and Moeis et al. (2020), optimising human capital investment can increase the income and education of smallholder households. Less-skilled smallholders need more exposure to the agricultural products they cultivate. Involvement through training and courses is one of the possible human capital investments. When smallholders are highly skilful in handling the crops they culti-

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vate, the production and quality of their products will also increase, ultimately guaranteeing their well-being. Moreover, according to Zakaria et al. (2019), increasing human capital will increase agricultural productivity.

Optimal resources for the inputs used in agricultural production also play a role in the smallholders' well-being. According to Afolami et al. (2015) and Nsabimana (2021), production can be increased by using improved inputs, such as seed diversity, non-organic fertilisers, and pesticides. Smallholders' efficient use of agricultural input will lead to increased household income and reduced consumption costs.

The COVID-19 pandemic has had a profound impact on agricultural output and smallholders' income because, despite the optimal resources, there were still difficulties in obtaining intermediate inputs such as fertilisers and pesticides due to travel restrictions. The effect can be seen in the purchase of agricultural inputs abroad. In addition, the enforcement of travel restrictions led to border closures and tightened inspection procedures. Therefore, there were delays in transport and logistics services, especially at ports, causing smallholders to suffer losses due to the lack of inputs to carry out agricultural activities (Okolie and Ogundeji 2022).

COVID-19 also had an impact on investment in human capital. Before COVID-19, investment in human capital in the agricultural sector mainly focused on training and courses related to cultivation techniques. Most of the training and courses take place in physical mode, that is, face-to-face. However, when COVID-19 came out, training and courses went online. Smallholders' and workers' participation in online training and courses require skills in operating the platform used. Furthermore, as mentioned above, application knowledge must also be provided to smallholders and their workers. Therefore, before COVID-19, the level of technical knowledge of smallholder farmers was limited; with investment in human capital for training and courses, they could improve their knowledge of technology and; with investment in human capital for training and courses, they could improve their knowledge and understanding of technology and also increase their productivity. (Quayson et al. 2020).

Insurance. Agricultural insurance is gaining the attention of smallholders looking to improve their lives because today's forecasting technology can predict extreme weather patterns with high predictive accuracy. Therefore, agricultural insurance is used as an effective tool to protect smallholders from financial losses, as well as to balance the uncertainty of agricultural allocations and stimulate the growth of this sector. Similarly, Capitanio et al. (2011) found that insurance is one of the tools for managing the risk of asset impairment and improving the well-being of smallholders. De Nicola (2015) also found that insurance can permanently increase household income and consumption. However, insurance will subsequently lead to smallholders having fewer savings because, as a consequence of their insurance, they are less careful about the losses due to plant damage. Moreover, Marr et al. (2016) found that insurance can encourage investment among smallholders. Finally, the investment could also lead to the prosperity of the smallholders.

The COVID-19 pandemic had a negative impact on the income of smallholders. They have to bear losses due to restrictions enforced by the government to prevent the spread of COVID-19. Before the outbreak of COVID-19, most agricultural insurance programs served as protection against losses caused by extreme weather (Schwarze and Sushchenko 2022). However, there is no agricultural insurance that protects from pandemics. Therefore, the smallholders had to bear significant losses during the pandemic; and ultimately deteriorated their well-being.

Supplementary factors. In addition to the three main factors discussed, other factors can affect smallholders' well-being, market pricing, and tax policy. The price depends upon the interaction between the market's demand and supply. Smallholders are suppliers of agricultural products. Theoretically, they will increase the output when there is a price increase. However, the price will increase if there is a shortage of supply, and consumers are willing to pay more for the product if there is a shortage of supply. This situation can occur in both local and global markets. The income received due to the price increase, especially on the global market, is perceived as an increase in smallholder well-being (Minot and Daniels 2005). During the height of the COVID-19 pandemic, the difficulty of obtaining input materials and defective agricultural products led to increased prices due to inflation. It can also improve the well-being of smallholders, but the situation is the opposite for consumers.

The other factor is tax policy. Compared to other well-being factors, this factor negatively impacts the well-being of smallholders. It is because the taxes imposed on smallholders contribute to the increase in production costs, ultimately affecting their income (Parry 1999).

Meanwhile, eliminating export taxes can maximise the income of smallholder households (Choeun

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et al. 2006). Compared to the tax policy, subsidies can maintain smallholders' well-being, especially during the COVID-19 pandemic and endemic phases (Iqbal 2020; Mastronardi et al. 2020; Rozaki 2020). For example, according to China's National Development and Reform Commission (NDRC) (as cited in Pan et al. 2020), the cumulative amount of subsidies the Chinese government gave reached USD 937.5 million during the COVID-19 period. The subsidies were given to vegetable, chicken, and pig farms as well as raw milk producers, insurance premiums, frozen agricultural product storage and others to reduce the pressure on survival and business risk (Pan et al. 2020).

CONCLUSION

The objective of this study is to identify factors that affect smallholders' well-being by utilising the SLR method. To achieve the study's objective, 30 articles were identified from Scopus and WoS databases. Based on the discussion, there are three main factors that drive the well-being of smallholders, namely technology, optimal resource and insurance. Additionally, there are two supplementary factors: market pricing and tax policy. The study found that these factors will first stimulate the smallholders' economic well-being and, only then, their social well-being. If these two forms of well-being can be achieved, then sustainable well-being could be achieved, as Bakar et al. (2015) discussed.

The emergence of the COVID-19 pandemic poses a significant challenge to smallholders in the production and commercialisation of their agricultural products. The occurrence of this pandemic also affects their well-being. Several policy implications for stakeholders are proposed based on the above primary and supplementary factors.

These include encouraging local labour participation, increasing investment in human capital, utilising e-commerce applications in marketing agricultural products, and offering a multi-threat/disaster agricultural insurance scheme. In addition, providing continuous subsidies or increasing subsidies reduces the smallholder's burden from the impact of the increase in commodity prices due to COVID-19.

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