

# COVID-19 crisis, MSMEs resilience, and the role of ICT: A preliminary investigation in rural Bantul, Indonesia

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**Abstract.** The COVID-19 pandemic triggered widespread economic instability on a global scale, affecting micro, small, and medium-sized enterprises (MSMEs) as well. This paper presents an initial investigation conducted in Sriharjo, a rural area in Bantul Regency, Indonesia, to explore the resilience of MSMEs and the role of information and communication technology (ICT) in supporting their operations. Eight key informants, including a village-owned enterprise (VOE) manager, an online marketplace website administrator, and six traditional food and beverage MSME owners, were interviewed at the end of 2022. The outbreak prevention policies disrupted economic activities in Sriharjo, prompting the VOE to initiate specific strategies, such as business digitalization, to mitigate the economic impact. MSME owners employed various coping strategies during the crisis, leading to diverse outcomes during the recovery phase, with some experiencing further decline while others rebounded successfully. However, ICT utilization remained limited among the investigated MSMEs, despite the village government's early digitalization initiatives. To enhance business agility and scalability, comprehensive strategies must be designed to strengthen their digital capabilities in response to unpredictable changes.

## 1 Introduction

The COVID-19 pandemic has triggered serious disruptions to the global economy in 2020, affecting various businesses with varying degrees of losses. Specifically, the pandemic has caused multiple impacts such as decreased demand, supply chain disruptions, export barriers, raw material shortages, and transportation disruptions. According to Shafi et al., the COVID-19 outbreak has disproportionately affected micro, small, and medium-sized enterprises (MSMEs) due to their constrained resources, particularly in terms of finance and management, and their lack of readiness to cope with prolonged crises compared to larger companies [1].

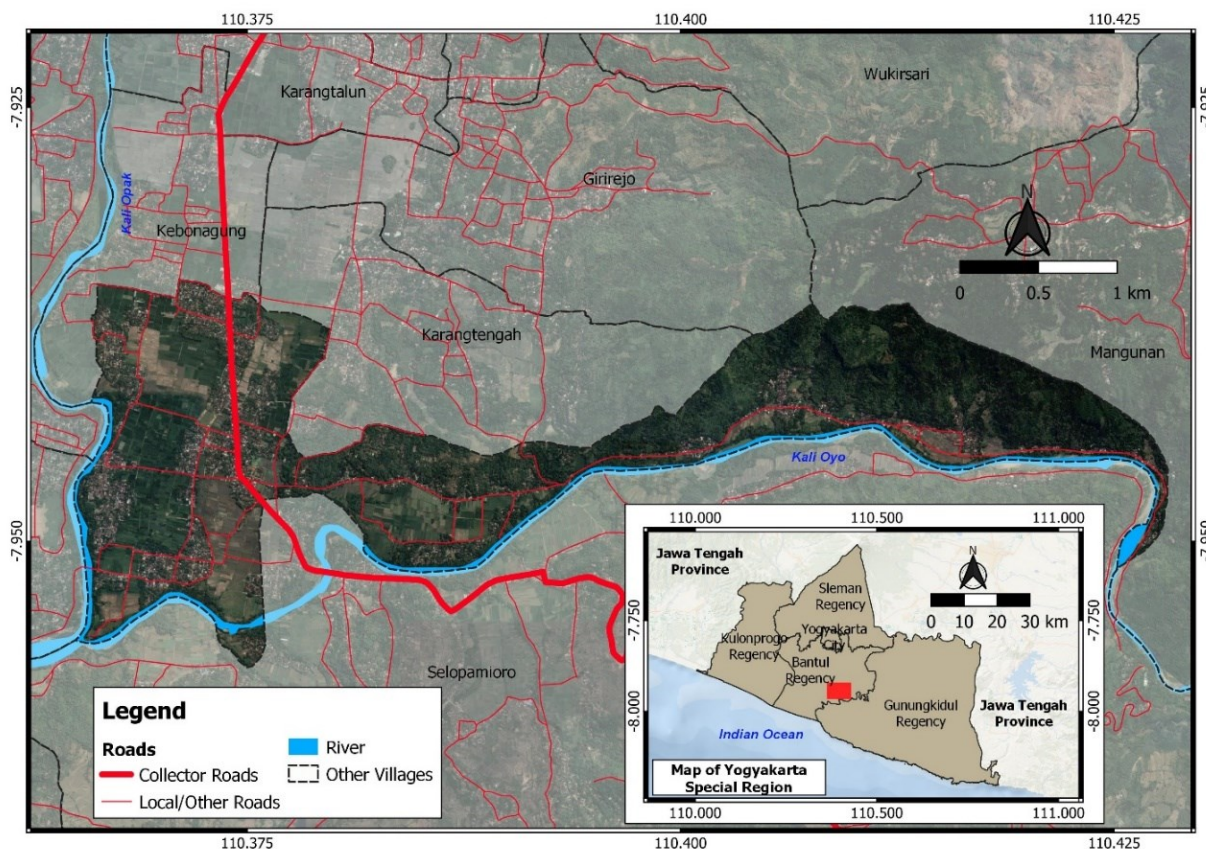
Similar to other less developed countries, the issues confronted by MSMEs in Indonesia during the pandemic necessitate particular focus and consideration. A study indicated that around 98.68% of the 64 million MSMEs in Indonesia are characterized as vulnerable micro businesses, susceptible to both internal and external economic shocks [2]. It was predicted that 9 out of 10 MSMEs face difficulties in product distribution, and more than 80% have lower profit margins during the pandemic. On average, Indonesian MSMEs experienced severe income declines during the first two months of the pandemic [3]. Operating as informal businesses is a major characteristic for most MSMEs, often resulting in their exclusion from social protection guarantees [4]. This underscores the vulnerability of MSMEs to the risk of poverty in times of crisis.

MSMEs affected by the crisis have sought coping mechanisms to mitigate the negative impact of the economic downturn. Previous studies have reported various internal strategies and the role of external support in enhancing MSME resilience during the COVID-19 pandemic [1, 2, 5]. Additionally, the physical restrictions related to the public health crisis have forced businesses to undergo digital transformation by adopting information and communication technology (ICT) in their operations [6]. The presence of applications, e-commerce services, and social media allows business owners to boost efficiency, expand market reach, and gain other benefits not achievable through traditional approaches.

Sriharjo is one of the rural areas in the Special Region of Yogyakarta Province where the livelihoods of its people heavily rely on trade and entrepreneurship. The common type of MSME found in this area is the traditional food industry. The COVID-19 pandemic is expected to have a significant impact on the local businesses in Sriharjo, although the scale of impact may vary among different types of MSMEs. Furthermore, some MSMEs have experienced a surge in profits amid the pandemic.

As of the end of 2022, the COVID-19 pandemic remains a global health emergency. Nevertheless, the trend of economic disruptions is estimated to have eased compared to the early stages of the pandemic. Based on

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**Fig. 1.** Study area map.

this background, this paper aims to analyze the resilience of MSMEs in Sriharjo and assess the role of ICT in supporting business continuity. The tangible outcomes of this research will play a role in empowering communities during times of crisis and aiding economic recovery in the aftermath of the crisis.

## 2 Case study region

The region of Sriharjo is administratively part of Imogiri Subdistrict, Bantul Regency, Special Region of Yogyakarta Province (Figure 1). There are two main rivers that serve as natural boundaries for the village, namely Kali Opak and Kali Oyo. The village covers an area of approximately 6.32 km<sup>2</sup> and was inhabited by 9,456 people in 2021 [7]. The distance to the central government of Bantul Regency is about 10 km, while the distance to the capital city of the Special Region of Yogyakarta (i.e., Yogyakarta City) is approximately 17 km. Most settlements are located on the western side, where the environmental settings are predominantly lowland-flat area and close to major transportation infrastructure.

Sriharjo is renowned as one of the major centers for MSMEs in Bantul Regency, particularly in the food sector (Table 1). The coordination of UMKM activities is generally entrusted to the village-owned enterprise (VOE) to facilitate management. Village-owned enterprise in Sriharjo was established in November 2019 through the initiative of the village head (*lurah*), but its effective operation began in May 2020.

**Table 1.** Number of MSMEs in Sriharjo.

No.	Type	Quantity
1	Food	83
2	Craft and furniture	10
3	Service	19
4	Agriculture	4
5	Grocery	3
<b>Total</b>		<b>119</b>

Source: Sriharjo village government (2022).

## 3 Research method

In-depth interviews were conducted simultaneously on December 8, 2022, with eight key informants comprising a VOE manager, an online marketplace website administrator, and six traditional food and beverage MSME owners in Sriharjo. The participants representing MSME owners in this study produced various traditional food and beverage products (Table 2). The question design was in an unstructured format. The interview sessions lasted for one to two hours.

The interview results were analyzed using qualitative descriptive techniques. The findings were reported in several sections. Firstly, this study described the interview results with the VOE manager and online marketplace administrator to understand the general impact of the pandemic on MSMEs and investigate the use of online media developed by the village

**Table 2.** Brief description of investigated MSME businesses.

Identity	Product Type	Year of Establishment	Product Description
M1	<i>Rempeyek kacang</i>	2004	Crispy snack made from rice flour with a filling of nuts
M2	<i>Keripik tempe</i>	2000	Processed snack made from <i>tempe</i> (traditional food made from fermented soybeans), thinly sliced and mixed with other additional ingredients
M3	<i>Wedang uwuh</i>	2016	Traditional herbal beverage made primarily from ginger, cinnamon, cloves, and other natural spices
M4	<i>Keripik tempe sagu</i>	2010	Snack variant of <i>keripik tempe</i> that uses sago as an ingredient in the production process
M5	<i>Kerupuk</i>	1995	Snack made from tapioca flour mixed with flavorings
M6	<i>Kue bawang</i>	2019	Snack made from wheat flour, shallots, and garlic

government for marketing local products. Secondly, the study delved deeper into the impact of the pandemic on selected MSMEs while simultaneously identifying their coping mechanisms and the role of ICT during the economic downturn.

## 4 Result and discussion

### 4.1 Results of interviews with VOE manager and e-marketplace administrator

The COVID-19 pandemic, which has spread worldwide since 2020, has caused significant economic effects on communities. Micro, small, and medium-sized enterprises have also been greatly impacted by the outbreak, facing various challenges in conducting their business activities. Similarly, the newly established VOE in Sriharjo faced unexpected challenges due to the pandemic.

In response to the pandemic, the Sriharjo village government initially learned from other VOE in Panggunharjo, Bantul Regency, which led to the development of the *Pasar desa.id* platform in April 2020. This platform aimed to facilitate online marketing for local MSMEs [8]. Over time, the implementation of *Pasar desa.id* expanded to include four other villages in Bantul Regency, namely Sriharjo, Guwosari, Ngestiharjo, and Wirokerten. In Sriharjo, the VOE played a key role in implementing *Pasar desa.id* as a means to disburse direct cash aid from the government, with the condition that beneficiaries spend the money on *Pasar desa.id* Sriharjo. However, the program faced challenges as certain products had low demand due to the lack of market research.

Another role played by the VOE in enhancing MSMEs' capacity in Sriharjo was initiating sales through social media during the pandemic. New regulations on physical distancing prompted a shift from face-to-face trading to digital platforms. While many existing MSMEs experienced setbacks and losses, some new ones emerged, adapting to online trading with cash-on-delivery systems.

Social media, particularly WhatsApp groups, were extensively used for marketing MSME products in Sriharjo during the pandemic. This initiative was deemed a viable solution to keep economic activities alive during the crisis. Utilizing social media as a digital marketing tool brought cost, time, and energy efficiencies to their business processes [9]. The application allowed sellers to promote their products, and interested buyers could proceed with private messages for transactions. Moreover, sellers and MSME entrepreneurs offered home delivery services to customers, even amid social restrictions.

In 2021, as the financial crisis began to ease, the VOE in Sriharjo established an MSME store (*gerai UMKM*) to showcase a variety of MSME products in a single location. This store allowed the VOE to benefit from distribution mechanisms and earn a margin from the sales. However, the policy of selling products at higher prices than the retail market, to prevent competition with the supported MSMEs, presented a dilemma. While this strategy helped avoid competition, it also had its drawbacks. Despite the limited profit margin, they were obliged to adhere to this policy as directed by the village government.

Furthermore, the village government is currently developing a website called *srirejeki.store* as a platform for buying and selling, which is part of the VOE's trading unit. The commencement of website development took place in early 2022, driven by the success of online sales during the initial stages of the pandemic. The website's aim is to rebrand MSME products, making them more competitive and expanding their market share to increase revenue.

During the interview, the website *srirejeki.store* was still in development, led by local youths. The planned mechanism includes advertising on the website, where visitors can place orders. The website administrators will then forward the orders to the VOE, which will coordinate with the MSMEs to fulfill the orders. MSME owners interested in advertising their products can register with the operator, and the products' eligibility for free advertisement will be assessed.

Based on the interviews, no revenue has been generated from sales yet since the website is still under development. However, there is optimism that the website will eventually become a valuable marketplace, showcasing products from Sriharjo and benefiting all MSME operators and the community at large. Several challenges encountered during website development include constraints in human resources, lack of training related to website development, and unclear salary structures.

## **4.2 MSMEs situation amidst the COVID-19 crisis**

### *4.2.1 The impact of the COVID-19 pandemic and business sustainability strategies*

Prior to the COVID-19 pandemic, several disasters associated with natural hazards in Sriharjo had caused negative consequences on local firms, such as the destructive earthquake tragedy in 2006, as well as flood events in 2017 and 2019. Out of the six MSMEs that participated in this study, four of them had previous experiences in facing these disaster crises (namely M1, M2, M4, and M5). Despite the challenges posed by these past disasters, these MSMEs demonstrated resilience by successfully recovering and restoring their businesses. However, the emergence of the public health crisis in early 2020 presented unprecedented challenges for the majority of MSMEs in Sriharjo. The prolonged state of emergency further exacerbated the situation, posing a risk of collapse for business owners who lacked sufficient responsive capabilities.

The COVID-19 crisis resulted in uneven impacts on MSMEs in Sriharjo (Table 3). Generally, this study found that almost all MSMEs experienced negative effects during the first wave of the pandemic, particularly M1, M2, M4, and M5. However, some did not experience significant impacts (M6) or even gained substantial benefits due to the pandemic (M3). At the time of the interviews (recovery phase), the situation of the four affected MSMEs was not homogeneous: deteriorated compared to the early stages of the pandemic (M1), the pandemic's impact was chronic and persistent (M4), returned to normal levels (M2), and experienced a bounce back better situation (M5). Additionally, each MSME owner employed unique coping strategies to sustain and improve their businesses.

For informant M1, the COVID-19 pandemic caused a serious disruption to their business, which employed 20 people. The informant reported that their traditional snacks were no longer regularly taken by sales from outside the region since the pandemic began. The most vulnerable point for this MSME occurred during the implementation of physical distancing policies, when their products were not sold at all. The survival strategy adopted by the MSME owner was limited to modifying the products in terms of quantity and package size. Despite the rising inflation trend, the MSME owner hesitated to increase the product prices due to market demand reasons. Instead of experiencing a recovery, the

marketing of the products tended to gradually decline. As a consequence, the MSME's revenue also experienced a drastic decline. Before the COVID-19 pandemic, the monthly revenue of this MSME ranged from 75 to 100 million rupiahs, whereas currently, it is less than 50 million rupiahs per month.

Similarly, the MSME initiated by M2 also faced the impact of the public health crisis and the accompanying mobility restrictions. Under normal circumstances, the small business was capable of daily snack production, but during the COVID-19 pandemic, their production capacity was limited to only twice a week. The MSME's income, which previously ranged from Rp 1,500,000 to Rp 2,000,000 per month, drastically decreased to Rp 400,000 to Rp 600,000 per month. The coping strategy adopted was similar to that of M1's MSME. However, contrary to the mentioned outcome of the informant, the revenue of M2's business bounced back after the crisis.

Unlike most MSMEs that encountered financial challenges and reduced consumer demand during the pandemic, the business owned by M3, operating in the traditional herbal beverage industry, had a remarkable story. It experienced a substantial income boost, particularly in 2021, with earnings increasing from Rp 2,500,000 to Rp 3,500,000 per month to Rp 5,000,000 to Rp 6,000,000 per month. This paradoxical situation occurred because people believed that herbal beverages could strengthen immunity and reduce the risk of exposure to the coronavirus, especially as recommended by the government at that time. To meet the high demand, the business owner had to hire additional workers from the local community. However, this stroke of luck lasted for only about a year, and eventually, the business reverted to its pre-crisis state. In essence, the global health challenge did not significantly harm the business since it already had a loyal customer base during normal times. Furthermore, the informant noted that other instantaneously emerging herbal beverage MSMEs in Sriharjo could not sustain their business due to the lack of regular customers.

For informant M4, the nonpharmaceutical interventions implemented during the pandemic caused a downturn in the business. In 2020, this MSME, which produced snacks, had to temporarily cease operations for two months and lay off 15 employees. As an alternative livelihood, the business owner worked in one of the local MSMEs producing traditional herbal beverages, which were in high demand. After working temporarily at the other place for two months, the informant revived their own business on a smaller scale and currently employs six workers. The MSME owner estimated that before the crisis, their net income was around Rp 250,000 per day, but now it is less than Rp 100,000 per day. The business operations of M4 were heavily influenced by inflation. In response to the rising costs of raw materials, the MSME owner took the initiative to marginally increase product prices and introduced packaging innovations. Unfortunately, these actions did not result in a substantial income recovery.

The COVID-19 pandemic initially caused a temporary collapse of the MSME owned by M5. Fortunately, the business is now able to leap forward. In the early stages of the pandemic, the business

**Table 3.** Business conditions and coping strategies of each MSME.

Identity	Business Conditions	Coping Strategies
M1	Sales of products drastically decreased since the pandemic. Currently, the business performance is continuously declining, with revenue decreasing by half	Modified the quantity per package and adjusted the product size
M2	During the peak of the pandemic, the production process faced significant obstacles, resulting in a 30% decline in net profit. However, production and profits have now returned to pre-crisis levels	Modified the quantity per package and adjusted the product size
M3	There was a 200% increase in revenue due to high market demand during the pandemic, although it was temporary in nature. Currently, the business is operating as usual during the new normal phase	Recruited additional workforce to meet market demand
M4	The business had to lay off employees and experienced a 60% decline in revenue during the pandemic. Currently, the business is still running, although the impact of the pandemic persists for a long period	Increased selling price and expanded the target local market by creating variations in product packaging sizes
M5	Employees were initially exposed to the virus, leading to a 50% decrease in production and revenue. However, the business managed to leap forward during the pandemic until the new normal period by adapting to market demands	Expanded marketing to customers with more stable and continuous demand
M6	There was no significant impact (stable sales since the crisis) as the business already had regular resellers in various outlets	Modified packaging and changed product branding design

experienced a significant drop in revenue by 50%. However, this decline was primarily due to a high number of employees getting infected with COVID-19, leading to the inability to produce snacks. The business came to a halt for six months. To maintain sales, the MSME owner had to sell pre-cooked snacks sourced from local community members involved in producing traditional raw snacks. Over time, the owner initiated the expansion of marketing to more stable customers, particularly to boarding schools. This approach effectively increased monthly turnover from 25-30 million rupiahs (pre-crisis period) to around 40 million rupiahs. Throughout the new normal phase, M5's MSME situation remained stable and experienced continuous growth as traditional market transactions recovered.

The last informant interviewed in this study (M6) stated that the COVID-19 pandemic did not have a significant impact, despite their business being relatively new (established since December 2019). The MSME owner already has permanent resellers at various locations, especially schools and government offices. The average annual revenue from product sales amounts to around 50 million rupiahs. Until now, the business conditions continue to operate as usual, and efforts are ongoing to develop through product packaging and branding innovations. Despite the stable progress in the MSME's performance, the owner encounters personal obstacles, as they must balance production with the responsibility of caring for family members with special

needs. Additionally, the situation is made more complex by the fact that the husband and wife, who constitute the core team managing the business, have not yet recruited any employees.

In short, the findings of this research align with other studies that highlight how the COVID-19 crisis has exposed deeper vulnerabilities of MSMEs [1-3]. Mobility restrictions, declining consumer demand, and inflation are among the major issues that trigger economic instability [10]. Small-scale businesses are at risk of failure when their sales revenue declines due to thin profit margins, lack of financial reserves (if any), and limited access to debt financing [11]. It should be noted that the pandemic's impact is not uniform across all MSMEs and depends on various factors, such as industry sector, business size, business model, consumer behavior dynamics, and government interventions [12, 13]. For example, this study found that traditional herbal beverage businesses did not experience negative effects and, in fact, benefited from the COVID-19 crisis. This means that despite the challenging economic climate, certain MSMEs were able to capitalize on unusual demand opportunities, leading to substantial revenue growth.

Coping mechanisms play a crucial role in strengthening MSMEs' resilience. The strategies differed depending on the sector and location of operation, as well as unique challenges faced within the entrepreneurial ecosystem [14]. However, internal strategies did not guarantee that all MSMEs could adapt

to market changes and recover from downturns. MSMEs in less developed countries, where informal businesses are prevalent, often struggle to overcome unwanted situations due to resource constraints and dependence on the local market. Additionally, limited government support could hinder the accelerated recovery of affected businesses [15, 16].

#### 4.2.2 Challenges on digitalization

The pandemic disaster has transformed the business landscape for MSMEs across various fields. As a result, adaptation is necessary for businesses to survive. Digitalization has become one of the options that MSMEs can pursue. By changing sales and marketing strategies through social media or e-commerce, it is expected that the sales products can reach a broader market [17]. However, as newcomers to the ICT world, MSME owners face challenges in transforming their businesses. This results in not all MSMEs utilizing ICT as their business strategy.

The utilization of ICT as a business sustainability strategy during the COVID-19 crisis has elicited diverse responses among MSMEs in Sriharjo (Table 4). This study found that the majority of MSMEs have not fully utilized ICT. M1, M2, and M4 do not utilize any ICT platforms in their businesses. Their marketing mechanisms still rely on conventional methods, such as direct sales in local traditional markets. M3 and M6 have utilized WhatsApp and online marketplaces in marketing their products, but the online marketplace platform was not sustained due to suboptimal performance. On the other hand, M5 has utilized ICT as a marketing platform, but the contribution of e-commerce sales to their overall revenue remains relatively small. Therefore, M3, M6, and M5 can be considered to have implemented a hybrid system (conventional and digital), but conventional sales still significantly contribute to their business income.

The lack of ICT utilization among MSMEs in Sriharjo is attributed to several factors. Firstly, it is due to the limited knowledge of MSME owners in operating ICT. This condition is experienced by M1, M2, and M4, as they have not received any digital marketing training. Secondly, the scarcity of skills possessed by MSME owners. M3 and M6 acknowledge this issue, even though both have received digital marketing training from the local government authorities. However, they encountered difficulties in operating the platforms, leading them to halt e-commerce or online marketplace sales. Thirdly, the low revenue obtained from ICT platforms. M5 recognizes this challenge. Despite using ICT platforms like a business website and conducting marketing on e-commerce, the sales contribution from these platforms only accounts for 2% of their total sales revenue.

These findings align with other research that highlights the factors contributing to the limited digitalization level of MSMEs in Indonesia. Many MSME owners are hesitant to adopt digital means due to feeling inadequate in utilizing the internet effectively [17]. This sentiment may be influenced by the average age of MSME owners in Indonesia, who belong to the

Generation X (born between 1965-1980), facing technical difficulties in operating gadgets and adapting quickly [18]. Additionally, another significant factor is the limited internet infrastructure in certain areas. Uneven distribution of infrastructure leads to more digitalization being observed in urban areas [18].

**Table 4.** The role of ICT in MSME business operations.

Identity	Reports on ICT Utilization
M1	Marketing strategy is still conventional, has not utilized any ICT platform
M2	Marketing strategy is still conventional, has not utilized any ICT platform
M3	Has utilized social media and online marketplace to sell products, but the latter platform did not continue due to skill limitations and the results were not optimal
M4	Marketing strategy is still conventional, has not utilized any ICT platform
M5	Currently attempting to market products through e-commerce, although its contribution to the total revenue is still relatively small
M6	Has utilized social media and online marketplace to sell products, but the latter platform did not continue due to skill limitations and the results were not optimal

In summary, the ICT utilization among MSMEs, especially in rural areas, is not yet effective. Not all MSMEs are prepared to conduct business digitally. This is influenced by the perception of MSME owners regarding their optimism and competence in using the internet. This challenge requires the attention of the government, considering that MSMEs are the main drivers of Indonesia's economy. Measures such as providing digital infrastructure, financing schemes, training, and mentoring for MSME owners to go digital should be implemented [19, 20]. When MSMEs successfully transform in the digital era, they are expected to become a key pillar in the post-COVID-19 national economy.

## 5 Conclusion and recommendation

The COVID-19 pandemic has clearly resulted in significant impacts not only on the macroeconomic level but also on small-scale businesses owned by the community. Village-owned business organizations are trying to overcome the challenges through various initiatives, including utilizing the Pasardesa.id application and promoting the use of social media for digital marketing since the early stages of the pandemic. During the new normal phase, the utilization of ICT in business continues to be encouraged, as evidenced by

the development of local online marketplaces (i.e., *srirejeki.store*) that are expected to drive digital transformation in the MSME business system in Sriharjo.

On a micro level investigation, this study gives the impression that the COVID-19 crisis affected MSMEs differently in Sriharjo. Generally, business owners experienced a significant decline in income due to a lack of buyers and disruptions in producing products. However, surprisingly, there were also MSMEs that managed to reap multiple-fold profits amid the public health emergency, such as traditional herbal beverage producers. Various businesses adopted different coping strategies to survive in challenging situations. Unfortunately, this did not guarantee that all MSMEs could restore their business conditions to pre-COVID-19 pandemic levels.

Although there have been initiatives for MSME digitalization by the village government, in reality, most of the interviewed MSMEs are still not ready to conduct business digitally. Traditional methods remain the primary marketing strategies, and despite incorporating ICT platforms, they have not shown substantial effectiveness. Lack of knowledge and skills remains the main obstacle faced by MSMEs in adopting digital business models.

To ensure the progress of VOE and the resilience of MSMEs in facing crises, strong collaboration among various stakeholders is required. This collaboration aims to accelerate the recovery of MSMEs and enable them to enhance their capacity to adapt to economic volatility. An initial step involves data collection (by name by address), serving as the foundation for monitoring local economic potential and facilitating targeted and transparent assistance. Furthermore, the government should offer incentives to encourage MSMEs to innovate their business models, particularly by embracing digital technology. Village-owned enterprise can collaborate with relevant stakeholders to optimize existing digital platforms and provide effective online product marketing strategy training.

This study has some limitations to consider. The number of participants involved is limited, so the findings obtained may not fully reflect the experiences of MSMEs in general during the crisis. Additionally, these findings should be compared with MSMEs operating in other sectors, such as handicrafts, fashion, agriculture, and others. It should be acknowledged that the challenges and strategies employed by MSMEs in various sectors can differ significantly. Lastly, future studies should also evaluate the government's role in supporting MSME resilience.

The authors would like to express gratitude to the Sriharjo village government for their invaluable support and facilitation in gathering research data.

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