



# Rethinking Informal Economy Resilience during Crisis: Experience from COVID-19 Pandemic

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Accepted: 21 August 2023 / Published online: 3 October 2023  
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## Abstract

The COVID-19 pandemic has disrupted the public health system and socio-economic sector, one of the worst being the impacts on the informal economy. Despite their past survival, the current pandemic-induced crisis has cast doubt on informal economy resilience. This study aims to capture the informal economy resilience facing the unprecedented economic crisis triggered by the COVID-19 pandemic. We reviewed 42 selected peer-reviewed journal articles to synthesise a general concept of informal economy resilience during pandemic-induced crisis. We found that strict lockdown during a pandemic becomes the main driver that exacerbates the vulnerability of informal economy. The impacts are spatiotemporally varied, different within the group, and have multilevel characteristics (from individual to society). This vulnerable condition has triggered the informal economy to conduct several coping mechanisms to face economic disadvantages. Both individual coping mechanisms and government intervention have altered the informal economy's resilience throughout time. The current combination of defense mechanisms results in four possibilities: bounce back better, bounce back, recover but worsen, and collapse. This review offers valuable insights into the appropriate actions that governments should undertake in response to economic downturns resulting from pandemics. It highlights the importance of considering vulnerable groups when formulating policy during a crisis.

**Keywords** Informal Economy · COVID-19 · Socio-economic Impacts · Resilience · Crisis

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## 1 Introduction

The coronavirus disease (COVID-19) pandemic is a multifaceted crisis that has affected various aspects of society, i.e. public health, social, economic, and political realms (Anazonwu et al. 2021). Besides its multisectoral impacts, researchers have posited that this pandemic has disproportionately impacted the most socially and economically vulnerable groups (Braam et al. 2021), particularly those engaged in the informal economy (ILO 2020). The informal economy encompasses any economic activities involving workers and economic units that are not covered or insufficiently covered by formal arrangements (ILO 2015). The International Labour Organization (ILO) report indicates that approximately 2 billion informal workers and business owners lost their jobs during the pandemic (ILO 2020). The COVID-19 pandemic significantly impacted more than 76% of informal economies in the world, the majority in developing countries. Scholars highlighted that the COVID-19 pandemic hit the informal economy by losing customers, causing revenue declines, and even business closures (Helgeson et al. 2022).

Numerous studies have recorded various impacts of previous financial crises (i.e. the Asian Financial Crisis of 1997–98 and the Great Recession of 2008–09) on the informal economy (Mehrotra 2009; Jaskova 2017; Kahlayar et al. 2020; Blanton & Peksen 2021). Academics subsequently debated whether the informal economy could be resilient and act as a safety net during the crisis or potentially exacerbate the repercussions (Pitoyo et al. 2020). Still, in the context of the COVID-19 pandemic-induced crisis, limited studies have attempted to elucidate the resilience of the informal economy.

It is important to note that resilience is relatively defined in relation to the stressor or shock that a system experiences (Carpenter et al. 2005; Pike et al. 2010; Davoudi et al. 2012). Resilience is not a single static system but a dynamic system that involves the ability to adsorb, adapt and restore after a disaster (Proag 2014). It may be altered by time and the environment in which the system or part of the system is experienced. Those who demonstrated resilience during previous crises may not necessarily exhibit the same level of resilience in subsequent crises with distinct causes and characteristics in causing disruptions (Pitoyo et al. 2020). Therefore, it is imperative to comprehend resilience in a context-specific manner.

Currently, scholars perceive the informal economy as a vulnerable group and become a burden on development. It is a byproduct of poverty (La Porta & Shleifer 2014). On the other hand, it is important to note that the concept of vulnerability and resilience remains subject to ongoing debate as they are both products of social construction (Bolin & Kurtz 2018; Endress 2015). A group's vulnerability and resilience characteristics could be expressed simultaneously (Usamah et al. 2014). Therefore, it is crucial to recognise and consider both the vulnerability and resilience aspects of an entity when examining its response to a disruption. This understanding is essential in comprehending how the entity sustains its existence following a disruption, even in situation where it may encounter total loss.

This paper aims to present key debates about the concept of resilience brought into the context of pandemic and informality, especially from a socioeconomic perspective. We approach resilience by understanding impacts and coping mechanisms synthesised from previous studies. This work, in hope, can contribute to academics' discussion on informal economy strategies in responding to crises and provoke scholars to challenge the concept of informal economy resilience with empirical studies. Furthermore, the characterisation of the informal economy, specifically its resilience, holds significance in developing better policies for managing the informal economy, an aspect often neglected in urban and economic development (Sassen 1994; Sultana et al. 2022).

This study is significant due to the predominant role of the informal economy in developing countries economic structure. If developing countries can demonstrate their ability to implement strategies that strengthen and sustain the informal economy during the pandemic, it will present a significant prospect for the organisation of their informal economic endeavours. This study may be limited to the selected cases, but it is hoped to provoke further understanding of resilience and its relevance to multisectoral disaster management.

## 2 Conceptualising the Resilience of the Informal Economy

Resilience has become a central terminology in various disciplines, particularly social sciences, medicine, engineering, environmental sciences, and psychology (Mayar et al. 2022). Consequently, there is no agreed definition of resilience. However, some classical resilience concepts have attracted the most attention and have become the foundation in theory development, i.e., ecological and engineering perspectives (Holling 1973). Engineering resilience views that equilibrium in a system will always be achieved again after being altered by disturbances. Ecological resilience has similar assumptions to engineering resilience regarding path dependence, but it emphasises the idea of multiple equilibria. In subsequent evolutions, contrary to the equilibrium assumption, the adaptive approach focuses on the ability of the system to change, adapt, and transform in response to strains and stresses, and the system itself is complex, dynamic, self-organising, unpredictable, and can change at any time (Carpenter et al. 2005; Pike et al. 2010; Davoudi et al. 2012).

Concerning resilience studies, understanding community resilience is a prerequisite for sustainable development. However, resilience is not simply reflecting the effects of quantified variables as other qualitative factors influence the difference in resilience building among groups (Béné et al. 2016). For example, social cohesion influences society's ability to transform livelihood, institutional structure influences the transformative capacities of society, and governance leadership determines the community's capacity to adapt to change (Coulthard 2011; Pelling & Manuel-Navarrete 2011; Schwarz et al. 2011). Furthermore, Béné et al. (2016) found that wealth is an essential factor in the recovery process of a household affected by a disaster.

The concept of resilience has also been explicitly discussed from macroeconomic and labour market perspectives (Bigos et al. 2013; Hijzen et al. 2017; Simões et al. 2022). In the context of economic activities, it has been known that there are

different characteristics between formal and informal economies, possibly reflecting their ability to adapt to changes. The latter economic activity is a major concern in assessing labour market resilience due to multiple vulnerability determinants (Brata 2010; Rothenberg et al. 2016; Garzón-Duque et al. 2017). It is imperative to mention that not all those involved in the informal economy are poor, but it is recognised that there is a positive association between informality and poverty (ILO 2018). Given this fact, the transition of workers and economic units from the informal economy to the formal economy has become one of the strategic approaches to building resilience (ILO 2017).

Despite the general view that people working in the informal economy are vulnerable, they can respond to ongoing socio-political and economic challenges. For example, informal sector workers in Ghana have successfully designed savings strategies and free-interest loans even though they face barriers to access to formal financial institutions (Danso-Wiredu 2021). Furthermore, Armansyah and Sukamdi (2021) reveal that informal entrepreneurs could improve their businesses despite the lack of government intervention. In addition, several studies have uncovered and identified coping strategies employed by informal workers using a sustainable livelihood framework (Mago 2018; Chamaratana et al. 2018; Foster et al. 2021; Malak et al. 2022). Indeed, the informal economy may contribute positively to local economic growth, improve living standards, and play a crucial role in socioeconomic development on a broader scale (Addai 2011; Agyei et al. 2016; Thulare et al. 2021).

The resilience of the informal economy is increasingly being tested when dealing with economic upheaval. Pitoyo et al. (2020) argue that there are optimistic and pessimistic views regarding the ability of the informal economy to survive amid a crisis. The optimistic view states that flexibility and employment absorptive capacity is key to the informal economy's resilience. In contrast, the pessimistic view assumes that the crisis increases vulnerability, especially without adequate social security. Still, little evidence suggests the resilience of the informal economy during the economic crisis induced by the pandemic (Pitoyo et al. 2020).

In this study, we will focus on the socioeconomic resilience of the informal economy. In our context, the concept of socioeconomic resilience pertains to the capacity of actors engaged in the informal economy to effectively deal with challenges associated with basic needs in emergencies (Alexander 2013). We attempt to enrich the current understanding of resilience in a vulnerable group by revisiting various studies that portrayed the informal economy during the pandemic. By juxtaposing the informal economy's vulnerability toward the pandemic's socio-economy impact and their ability to respond, we are trying to enrich the current academic discussion on resilience and vulnerability as a contiguous concept. Moreover, bringing the context of pandemic-induced economic shocks will give insight into the informal economy study, which is largely contextualised within a market-driven crisis.

### 3 Method

This paper reviewed existing studies on the impacts of the COVID-19 crisis on the informal economy and its coping mechanism, published until August 2022. Articles related to this research topic were searched in the Scopus database and/or reputable publishers, such as Elsevier, Wiley, Taylor & Francis, Springer, Emerald, Sage, Multidisciplinary Digital Publishing Institute, and PLOS. The keywords used are 'informal economy', 'informal worker', 'informal sector', 'informal labour', and 'shadow economy', each added with 'COVID' so that the selected publications focus on the COVID-19 pandemic period. We limited our search to peer-reviewed journal articles written in English, focusing on socioeconomic contexts. In addition, reports based on reviews, viewpoints, short communications, perspectives, and commentaries were not designed as the primary material in this review. Initial screening was carried out on each article to ensure the relevance of the discussion to the topic and remove articles containing exclusions.

We employed thematic analysis to understand the resilience mechanisms of informal economy actors during unfavourable situations due to the COVID-19 pandemic. This approach identified several significant factors before being arranged into principal themes (Booth et al. 2016). The analysis involved careful reading and re-reading of the articles. The initial analysis began by identifying the impacts on informal workers during the COVID-19 pandemic as a reflection of the impact of the shock on their pre-existing vulnerabilities. Furthermore, we observed how affected people develop coping strategies to mitigate shock, including the role and existence of social protection supports behind them. Finally, we discussed the conceptual framework of informal economy resilience concerning the COVID-19 pandemic as an outcome of synthesising research articles.

### 4 Pre-Existing Precarity Exacerbated by the COVID-19 Pandemic: A Reflection on Vulnerability

Comprehending the resilience of a group or community is inherently intertwined with comprehending their vulnerability characteristics. It will illustrate the initial capacity of the community when facing hardship and how far the hardships disrupt the initial condition. Proag (2014) mentioned that vulnerability implies a level of risk resulting from the ability to cope with the subsequent event. Usamah et al. (2014) found that vulnerability overlaps with resilience. The study explained that communities are vulnerable in numerous ways but have characteristics that allow them to be resilient.

This review has collated 42 articles, which will be utilised as the primary reference for extracting the impacts of the COVID-19 pandemic on the informal economy. These articles are listed in Table 1. All reviewed articles in this study revealed that the pandemic had unprecedented impacts on the informal economy. Nevertheless, many scholars have considered the informal economy a robust economic activity expected to survive during past crises (Akuoko et al. 2021; Zhanda et al. 2022;

**Table 1** List of reviewed literature

No	Study	Date (first published)	County	Purpose	Highlight
1	Adom et al. (2020)	30/06/2020	Ghana	Analyses the impacts of the COVID-19 lockdown on the livelihoods of informal workers in Kumasi	COVID-19 restrictions hit informal workers, plunging them into extreme poverty
2	Saleh (2021)	10/09/2020	Kuwait	Analyses the role of information and communication technologies and social media for the informal home-based business in Kuwait City during the pandemic	Business operators employ social media, email, and websites for customer communication
3	Komin et al. (2021)	16/10/2020	Thailand	Explains the impacts of COVID-19 on the informal sector in Thailand and survival strategies in response to these conditions	Informal workers experience dramatic decreases in their monthly income Informal workers use savings and incur debt to offset income reduction
4	Omobowale et al. (2020)	23/10/2020	Nigeria	Examines the impact of COVID-19 on informal workers in the context of poverty and livelihood experiences	COVID-19 containment measures are seen as favouring the wealthy, frustrating the poor
5	dos Santos et al. (2020)	30/10/2020	Brazil	Simulates the economic impacts of the withdrawal of informal workers from the labour market due to the lockdown in Bahia state	Withdrawal of informal workers decreases the productive capacity and causes significant adverse effects on the economy
6	Azeez et al. (2021)	02/11/2020	India	Explores the impact of COVID-19 on women migrant workers in Delhi and Gurugram	The pandemic's impact on women migrant workers ranges from loss of livelihood, the burden of responsibility to insufficient support
7	Bassier et al. (2021)	08/12/2020	South Africa	Examines how social assistance, which is not designed to support informal workers, can provide emergency relief for informal worker households	Combined grant approach proposed for addressing the impact of COVID-19 on informal workers
8	Kimuli et al. (2021)	30/03/2021	Uganda	Explores the intention of informal micro and small enterprises (MSE) in utilising digital technology in Kampala during the pandemic	COVID-19 amplifies impact on Ugandan MSEs, spurring digital adoption

Table 1 (continued)

No	Study	Date (first published)	County	Purpose	Highlight
9	Koloma (2021)	05/05/2021	Senegal	Identifies the determinants of access to credit, sales decline, and business growth prospects in the 12 months following the pandemic and assesses the impacts of credit on the informal enterprises' sales decline	Age and gender influence sales decline; registered enterprises have better loan prospects
10	Sohel et al. (2022)	07/05/2021	Bangladesh	Explores the impacts of lockdown on informal migrant workers and their coping strategies to survive in Dhaka	Lockdown leads to severe income loss, pushing people to starvation Coping strategies help, but livelihoods remain fragile amid pandemic challenges
11	Lenshie et al. (2021)	11/05/2021	Nigeria	Explains the impact of the pandemic on women informal workers in the peri-urban area	Lockdown worsens marginalised women's family support roles
12	Sumalatha et al. (2021)	25/06/2021	India	Assesses the situation of domestic workers in three cities during the pandemic	Widespread job loss is reported among domestic workers Domestic workers also experience discrimination at the workplace and other impacts at home
13	Toriro and Chirisa (2021)	25/06/2021	Zimbabwe	Assesses the effects of lockdown on informal food traders in Harare	In a restricted trading environment, the advantage lies with traders on wheels who can easily transport larger stocks and make swift exits
14	Dzawanda et al. (2021)	05/06/2021	Zimbabwe	Examines the impacts of lockdown measures on the informal workers in Gweru and assesses their survival strategies	Amid the lockdown, numerous individuals in the informal sector resorted to unlawful actions for survival
15	Cárdenas et al. (2021)	01/07/2021	Colombia	Describes the potential effects of COVID-19 on informal employment	Informal employment less adaptable to remote work than formal employment

Table 1 (continued)

No	Study	Date (first published)	County	Purpose	Highlight
16	Alam et al. (2021)	24/08/2021	Bangladesh	Analyses the dimensions of the vulnerability of informal floating workers in Dhaka City in the context of COVID-19	COVID-19 pandemic exacerbates the vulnerabilities of floating workers
17	Pitoyo et al. (2021)	24/08/2021	Indonesia	Assesses the impacts of the crisis on informal workers and their responses in Yogyakarta in the first wave of the pandemic	COVID-19 hurts the working hours and income of informal workers Most informal workers employ multiple livelihood strategies to survive
18	Coletto et al. (2021)	26/08/2021	Peru	Analyses the activities of street vendors in Lima during the first wave of COVID-19	Staying at home and discontinuing work during the pandemic is not a viable choice for street vendors
19	Nasution et al. (2021)	01/09/2021	Indonesia	Analyses the coping strategies of urban informal traders during the COVID-19 pandemic in Surabaya	Informal traders adapt to online trading, frozen storage, and finding strategic locations
20	Turner et al. (2021)	08/09/2021	3 countries	Examines the early impacts of the COVID-19 pandemic on street vendors and their coping mechanisms in Hanoi, Chiang Mai, and Luang Prabang	Pre-COVID policies challenge vendors, pandemic worsens woes Urban–rural links shift due to the pandemic, impacting vendors
21	Ogando et al. (2021)	08/09/2021	10 countries	Assesses the impact of the pandemic on care responsibilities and the effect on livelihoods and food security	Gendered analysis reveals the pandemic's distinct impact on informal workers Multidimensional crisis exposes unique 'pandemic recession' effects
22	Dudzai and Wamara (2021)	29/09/2021	Zimbabwe	Analyses the impacts of the COVID-19 pandemic on informal vendors and commuter omnibus drivers in Harare	Zimbabwe's lockdown hits informal sector operators, raising vulnerability
23	Singh and Kaur (2022)	27/10/2021	India	Analyses the vulnerabilities experiences of women informal workers in Punjab during the pandemic	Gender-specific impacts on women informal workers include poverty stress, food insecurity, mobility limits, health disruptions, and social ostracisation



Table 1 (continued)

No	Study	Date (first published)	Country	Purpose	Highlight
24	Busso et al. (2021)	04/11/2021	10 countries	Evaluates the potential impact of social protection programmes for people working in informal activities in Latin American countries	COVID-19 responses reveal structural issue: fragmented and insufficient social protection
25	Guo et al. (2022)	23/11/2021	China	Assesses the impact of the COVID pandemic on offline informal micro businesses	Informal businesses experience an abrupt and significant decline due to the crisis The COVID crisis affects informal businesses differently
26	Egana-delSol et al. (2022)	25/11/2021	Chile	Analyses the impacts of the pandemic the automation on employment in developing economy	Occupations at high automation risk face significant employment decline
27	Ndouna et al. (2021)	30/11/2021	Cameroon	Analyses the impacts of COVID-19 on informal workers empirically	Job losses pronounced in the informal sector, especially for men
28	Acevedo et al. (2021)	16/12/2021	16 countries	Analyses the dynamics of the informal labour market during the COVID-19 pandemic in Latin American countries	Preliminary data for 2020 show a substantial contraction in informal employment The informality rate in the post-pandemic period will increase in the medium term
29	Vu and Ho (2022)	27/12/2021	Vietnam	Identifies the determinants of access to credit for informal labour during the COVID-19 pandemic	Credit access plays an essential role in improving quality of life for informal labour Factors that positively influence credit access include education, material, collateral, credit size, credit source, and credit debt
30	Leyva and Urrutia (2022)	19/01/2022	5 countries	Documents the evolution of informal labour markets during the COVID-19 crisis in Latin American countries	Latin America's informal sector was hit hard by the pandemic, rebounding quickly
31	Wasima and Rahman (2022)	21/01/2022	Bangladesh	Investigates the vulnerability of domestic workers during the pandemic	Key vulnerabilities include job loss, income decline, food shortages, rent difficulties, and inadequate social security

Table 1 (continued)

No	Study	Date (first published)	Country	Purpose	Highlight
32	Elgin et al. (2022)	25/01/2022	168 countries	Investigates the relationship between the prevalence of the informal economy and fiscal policy response to the COVID-19 pandemic	Countries with a relatively larger shadow economy before the pandemic adopt a smaller fiscal policy package
33	Rwafa-Ponela et al. (2022)	17/02/2022	South Africa	Captures the impacts of COVID-19 on urban informal food traders during the initial lockdown period in three provinces	Lockdown leads to business closures, higher food costs, and lower demand
34	Thulare and Moyo (2022)	17/02/2022	South Africa	Analyses responses and adaptation strategies of informal street traders to the pandemic in uMhlathuze Municipality	Informal street traders respond to COVID-19 by defying regulations, relying on grants and savings to survive
35	Hartmann et al. (2022)	28/02/2022	8 countries	Assesses the socioeconomic impacts of the COVID-19 pandemic and associated lockdowns on waste pickers	The pandemic exacerbates the already precarious economic condition of waste pickers
36	Mondal and Chakraborty (2022)	14/03/2022	India	Investigates the effects of the COVID-19 pandemic on urban women informal workers in West Bengal, efforts made to survive, and the role of external support for their survival	Women engaged in informal sectors are surrounded by the aggression of multidimensional vulnerabilities Various temporary aid was received, but permanent support crucial for economic contributors
37	Swarna et al. (2022)	31/03/2022	Bangladesh	Analyses the impacts of the COVID-19 pandemic on the informal sector based on socioeconomic characteristics and their coping mechanism	Nearly all informal workers experience reduced income and food spending during the lockdown Urban, educated males in services and sales saw a higher impact
38	Khambule (2022)	20/05/2022	South Africa	Explores the socioeconomic impacts of COVID-19 on the informal economy in Kwadukuza Municipality	The pandemic exacerbates poverty and the vulnerability of informal workers The lack of targeted interventions deepens challenges for the informal economy

Table 1 (continued)

No	Study	Date (first published)	Country	Purpose	Highlight
39	Mohan et al. (2022)	11/06/2022	India	Analyses the impacts of the COVID-19 pandemic on the lives and livelihoods of female domestic workers in five Indian cities	The pandemic worsens plight, affecting income, consumption, and health access
40	Ravikumar et al. (2022)	27/06/2022	India	Measures the financial stress, literacy, and insecurity of street vendors during COVID-19 in Bangalore	The COVID-19 pandemic inflicts financial stress on street vendors, irrespective of their status Financial stress and financial literacy do not affect financial insecurity perceptions
41	Thanh and Duong (2022)	28/07/2022	Vietnam	Examines the economic burden experienced by women street vendors during the COVID-19 pandemic and investigates their coping strategies in Ho Chi Minh City	Women street vendors experience a sharp decline in business and consumption Vendors struggle with insufficient coping strategies to sustain businesses
42	Wijayaningtyas et al. (2022)	17/08/2022	Indonesia	Investigates the vulnerability of informal construction workers in major Indonesian cities during the social restriction phase associated with COVID-19	Informal construction workers face worsened conditions amid COVID-19

Leyva & Urrutia 2022). However, on another side, critical literature explicitly suggests that the COVID-19 pandemic presents different challenges than previous economic volatilities, which may result in different conditions compared to previous crises (Acevedo et al. 2021; Dzawanda et al. 2021; Thanh and Duong 2022).

The implementation of the lockdown policy led to placing the socioeconomically disadvantaged individuals into more fragile conditions, reflecting the possibility of secondary risks arising in conjunction with their exposure to health risks (Das & Das 2020; Jiang 2022). Drawing from prior research, it can be synthesised that there are three primary reasons why a lockdown policy could have precarious effects on the socioeconomic condition: (1) lockdown interrupts the supply–demand chains by transportation ban (Guan et al. 2020); (2) the restriction on population mobility leads to a cessation of economic activities and declining purchasing power (Bassier et al. 2021); and (3) lockdown and the continued decrease in income lead to job losses and or business closure (Rwafa-Ponela et al. 2022). In the following discussion, we highlight the impact of the COVID-19 pandemic and associated lockdown on the informal economy in three issues: general impacts, disproportionate impacts, and impact chains.

#### 4.1 General Impacts

The pandemic has highlighted the informal economy's vulnerability. Rather than the virus infection, most of the informal economy activities collapsed due to the derivative policy to handle the pandemic. Staying at home is not feasible for people who depend on daily wages for sustenance (Adom et al. 2020). Informal workers are also less compatible with telework and work-from-home orders (Cárdenas et al. 2021). Then, Egana-delSol et al. (2022) predicted that restrictions generated by COVID-19 act as a catalyst for the automation process in companies to adjust their employment composition and may put workers at risk of being replaced by technology.

Decreased income became the mainstream impact of the pandemic lockdown. For example, in Thailand, 95% of respondents from a study by Komin et al. (2021) indicated that they faced economic insecurity due to income loss during the pandemic. This condition is also found in a study by Guo et al. (2022) in offline micro businesses in China; they found that 50% of owner-managed businesses (OMBs) experienced income loss during the pandemic. Moreover, the loss of income has put informal workers in Nigeria into poverty because daily earnings characterise informal workers; when they do not run economic activities, they will find it difficult to meet their daily needs (Omobowale et al. 2020).

In South Africa, informal food traders were forced to close during the lockdown as they were not considered essential service providers by the government (Rwafa-Ponela et al. 2022). Domestic workers in India's major cities were forced to leave their jobs, mainly because of the employer's unilateral termination, followed by transportation barriers (Sumalatha et al. 2021). Moreover, from the side of informal enterprises, the closure of business activity was mainly caused by the disability to adapt their business activity. Research in Uganda found that most small-medium

enterprises closed because they did not have resources and knowledge in digital business, which was very needed during the lockdown (Kimuli et al. 2021).

Specific findings from several studies showed that instead of facing the possibility of job loss, some people experienced an increase in workload, even though it did not cause their income to increase (Pitoyo et al. 2021; Wasima & Rahman 2022). Moreover, the stigma of informal workers as ‘carriers of coronavirus’ is significant because much live and work in poor sanitary environments, exacerbating discriminatory treatment compared to the formal economy (Coletto et al. 2021). Harassment by law enforcement officers was often reported against informal workers operating in illegal places and times (Sohel et al. 2022; Thulare & Moyo 2021; Toriro & Chirisa 2021).

The intensity of precariousness was most felt by informal workers during the early stages of the spread of the COVID-19 virus, especially when the lockdown strategy was implemented. These adverse effects might be reduced during the relaxation phase, but sometimes recovery efforts were insufficient, and there were challenges to recovering quickly. Dzawanda et al. (2021) found that a large proportion of the informal sector in Gweru (Zimbabwe) was still prohibited from functioning optimally in February 2021. At a similar time, informal workers in Taraba State (Nigeria) were still struggling to revive their businesses due to inadequate social security schemes (Lenshie et al. 2021). Meanwhile, work opportunities could decline again, along with temporary restrictions on mobility, when the epidemic curve reaches its second peak phase (Mohan et al. 2022).

## 4.2 Disproportionate Impacts

The impacts of the pandemic were not uniform among informal worker groups, one of which is related to the urban–rural realm. Almost all the papers reviewed in this study conducted their research in the urban area, indicating that the urban informal economy has become a concern in many regions. A study in China concluded that microbusiness owners in urban areas tend to be more severely affected than rural ones (Guo et al. 2022). Moreover, in Bangladesh, informal workers in rural areas, especially those in the agricultural sector, had less income loss than urban workers (Swarna et al. 2022). This finding reinforces the argument that the crisis is more likely to hit urban areas than rural areas (Narula 2020).

Research indicates that the COVID-19 pandemic and lockdowns hurt occupational groups disproportionately. For example, domestic workers were slightly less affected by declining incomes than other sectors (Komin et al. 2021). Workers who interact with customers or find their markets forced to close are believed to be the hardest hit. Amongst the various categories of informal construction labourers in prominent cities of Indonesia, those engaged in odd jobs – which constitute the lowest-earning occupation within the construction sector – witnessed the most substantial reduction in their monthly earnings throughout the period of regional lockdowns (Wijayaningtyas et al. 2022). Furthermore, a study in Kuwait showed that the pandemic affected informal businesses utilising information and communication technologies and social media differently by sector, with food sector profits declining

(Saleh 2021). On the other hand, positive results were recorded in the gaming and entertainment sectors (Saleh 2021).

A gender perspective is no less important since women workers are often considered more vulnerable than men. The gender-based employment gap in pre-crisis situations is becoming more acute amid a pandemic. Some literature reviewed is known to capture the impacts of the COVID-19 pandemic by paying attention to the informal-gender nexus. In India, as women are highly dependent on the availability of public transport, the mobility restrictions triggered by the lockdown have caused women informal workers to suffer occupational impacts. Furthermore, the burden of meeting women's essential needs, enduring domestic violence, and being overwhelmed with household chores exacerbated their challenges (Mondal & Chakraborty 2022; Singh & Kaur 2022; Sumalatha et al. 2021). The lockdown policy in Nigeria's suburbs had similar negative impacts by altering women's job productivity and weakening their role in household livelihoods (Lenshie et al. 2021). Singh and Kaur (2022) emphasised that the pandemic's effects on women informal workers depend on status and role within the household, occupational types, level of education and skills, and the employers' prerogatives. The multidimensional impacts mentioned above are rooted in social marginalisation as a manifestation of class, caste, and religious identity discrimination.

Comparisons of the socioeconomic impacts triggered by the coronavirus outbreak between men and women have been carried out by several studies. In Cameroon, the sex group suffering the most significant loss of jobs and income was men informal workers (Ndouna et al. 2021). Meanwhile, the percentage change in income reduction in Bangladesh is more significant for women informal workers. However, the absolute value of the decrease in income is lower than for men workers (Swarna et al. 2022). According to a longitudinal study in 12 cities in 10 countries, women informal workers experienced higher household responsibilities than men. This situation is then linked to extreme income and working hours reductions during the lockdown and slower recovery during the post-lockdown period (Ogando et al. 2021).

Another segment that some literature pays special attention to is migrant workers. A study in Dhaka (Bangladesh) demonstrated that COVID-19 triggered significant income and occupational impacts on migrant informal workers (Sohel et al. 2022). In urban Vietnam, it was found that migrant vendors typically face social capital constraints and political marginalisation, making it more difficult for them to maintain business than local vendors in a lockdown situation (Thanh & Duong 2022). Migrants who come to urban areas in India have also experienced adverse effects of the pandemic, so their efforts to obtain a 'brighter future' have failed (Azeez al. 2021). In addition, the specific impacts experienced by informal migrant workers can also be in the form of difficulties in paying house rent, discrimination in the workplace, and the consequent implications for families who are left behind in the area of origin due to the loss of remittance flows (Sumalatha et al. 2021).

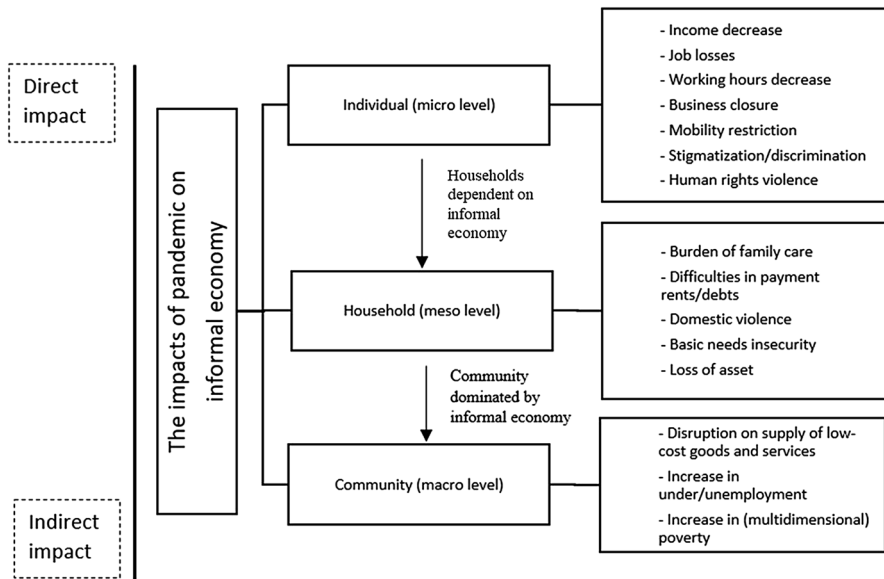


Fig. 1 Scheme of the impact of the COVID-19 pandemic on the informal economy

### 4.3 Impacts Chain

The pandemic impacted the informal economy in the multi-scale community. It impacted the informal economy on micro, meso, and macro levels (Fig. 1). Those impacts are hierarchically connected, as described in an impacts chain by Dzawanda et al. (2021). At the micro level, it impacts the individual of informal workers, such as income, working hours, and the job itself. Those impacts commonly happen directly after implementing the lockdown policy. At the meso level, the pandemic has made it difficult for informal economy households to access basic needs since they have lost almost their source of income. Often, this situation also affects household dynamics and livelihood assets. The impact on the household level can directly or indirectly occur after the lockdown, depending on the ability of informal workers to cope with the distress.

The adverse impacts on the lower levels subsequently impact the larger system. The indirect impacts discussed herein may arise due to cumulative effects experienced at the individual and household levels. The closure of informal food businesses, such as street vendors or traditional markets, results in a scarcity of affordable food supply (Ndouna et al. 2021; Rwafa-Ponela et al. 2022). In fact, Informal traders play a crucial role in safeguarding food security within developing countries by offering affordable food options to the general populace (Skinner et al. 2020).

At the macro level, significant consequences include substantial rises in under-employment rates, unemployment, and poverty rates, particularly in countries where the informal economy holds sway. The informal economy experienced higher job losses during the lockdown period, resulting in a subsequent impact on income

reduction. In the long term, this situation can potentially lead to poverty or exacerbate existing poverty, including in the dimensions of health, education, and living standards (Alkire et al. 2021).

## 5 The Coping Mechanisms of Informal Economy Actors

Although informal economies are often labelled vulnerable groups, they have unique mechanisms to address livelihood challenges. The assessment of individual's preparedness that overfocuses on fragility and ignores their capacity tends to lead to misunderstandings in the meaning of resilience. The limitations of actors working in the informal economy do not make this group give up and surrender to the situation. On the contrary, this power has been formed even when the crisis has not occurred to achieve prosperity. In other words, informal workers are not submissive in dealing with possible hazards, giving the impression that the vulnerability perspective should be closely related to human agency (McLaughlin & Dietz 2008).

### 5.1 Key Strategies for Addressing Socioeconomic Challenges

It is widely acknowledged that the informal economy is vulnerable to the change in population activities caused by the lockdown policy during the COVID-19 pandemic. The disruption in supply chains also has put them in precarious conditions. Despite this, the informal workers still have response mechanisms to deal with those conditions. For example, in Harare (Nigeria), street vendors collaborated with ex-formal workers who own cars, transforming them into merchandise carts in the face of space closures (Toriro & Chirisa 2021). In South Africa and Vietnam, informal traders changed product prices, explored new products, and employed new delivery methods of supplies (Thanh & Duong 2022; Rwafa-Ponela et al 2022). Several studies revealed that informal workers adjusted to market situations, reduced production costs, increased work duration (if possible), shifted jobs or did the additional job, and utilised digital information technology (Mondal & Chakraborty 2022; Kimuli et al. 2021; Nasution et al. 2021; Pitoyo et al. 2021; Sohel et al. 2022). In household units, members who previously did not work become involved in obtaining additional income (Mondal & Chakraborty 2022). In contrast to legal activities, informal workers were often also reported to be against government instructions during lockdown due to the impossibility of staying at home and being pressured by the necessities of life (Dzawanda et al. 2021; Thulare & Moyo 2021).

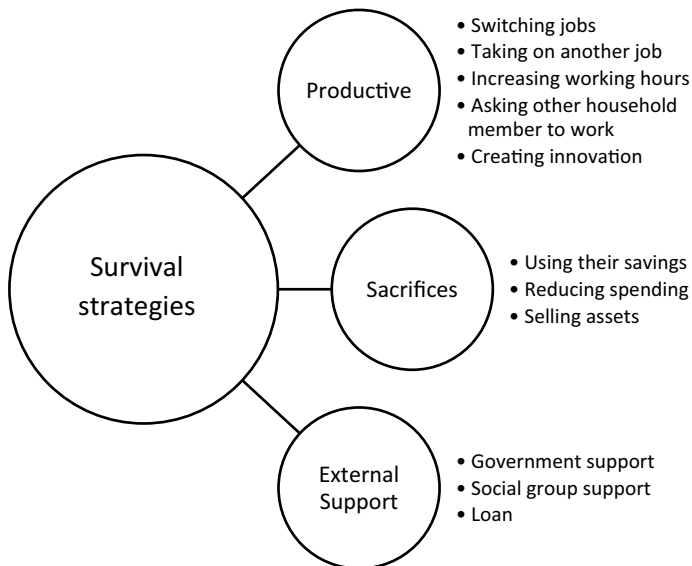
Managing household spending is considered a common response action by affected workers. Primary needs were prioritised, although lack of revenue sometimes constrained expenditures on necessary items. For example, women working in informal sectors might sacrifice their nutritional consumption to meet their children's needs, putting themselves at health risk (Singh & Kaur 2022). In addition, using savings and selling assets was often an option for informal households to survive a crisis, coupled with asking for loans or debts (especially from social networks



and moneylenders). However, these asset-depleting strategies were likely to erode household assets more deeply and make livelihood restoration efforts difficult (Hartmann et al. 2022; Mohan et al. 2022; Ogando et al. 2021). Social assistance also plays a vital role in facilitating informal workers to survive during a crisis. This support did not only come from the government but also family, neighbours, and non-governmental organisations, showing that social capital is an important factor in promoting resilience.

In summary, there are three types of survival strategies that informal workers conduct: productive, sacrifice, and external support (Pitoyo et al. 2021). A productive strategy means maximising the potential of productive assets to generate income. The sacrifice strategy emphasises efforts to deplete assets and reduce household expenditures to survive. External support relates to the involvement of external parties and is not related to the use of existing household assets. The categorisation of the common strategies of informal workers in dealing with the COVID-19 pandemic can be observed in Fig. 2.

Occasionally, several coping strategies were carried out when the previous economic crisis was not feasible for informal workers. Due to the government's restrictive measures, productive strategies (e.g. increasing working hours and finding alternative jobs) are often difficult to implement, so many people are trapped in unemployment conditions (Thulare & Moyo 2021; Pitoyo et al. 2021). The COVID-19 pandemic also introduces a new type of barrier to urban–rural spheres, where migration should be a social safety net for sustaining urban livelihoods is hindered by restrictive policies (Turner et al. 2021; Wijayaningtyas et al. 2022).



**Fig. 2** Categorisation of survival strategies carried out by informal workers (modified from Pitoyo et al. 2021)

## 5.2 The Importance of Adequate Social Safety Nets

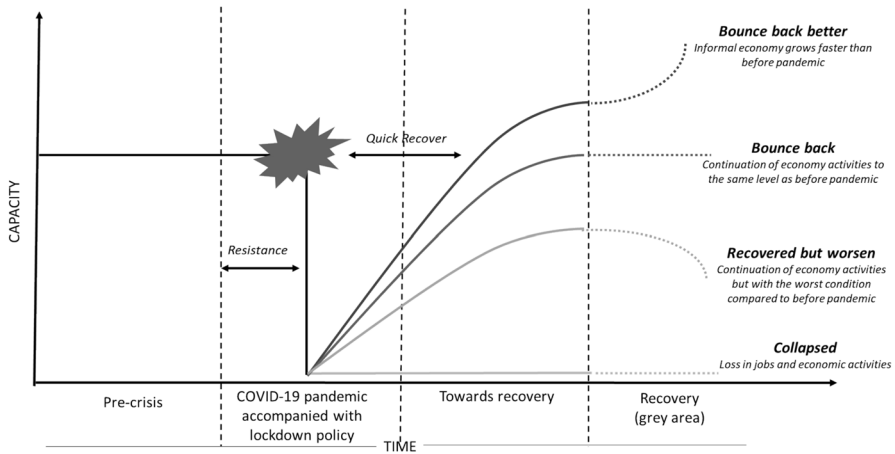
Internal-based ex-post strategies by informal workers are often insufficient to reduce the effects of a public health crisis. Not all efforts lead to favourable outcomes (also called negative coping strategies). In doing so, adequate emergency relief is needed to mitigate poverty and inequality. For example, in Bahia (Brazil), the negative impacts of the lockdown on informal workers were estimated to be halved through the government's income compensation mechanism (dos Santos et al. 2020). In China, social relief has also been proven to accelerate the recovery of informal businesses during the initial phase of the spread of the coronavirus outbreak (Guo et al. 2022).

Governments in various countries we have reviewed have introduced various social safety net programmes to reduce the livelihood risks of marginalised groups. Unfortunately, these schemes are not explicitly designed to cover informal economy workers. Most informal workers are not registered in social insurance or recognised in labour regulations. Studies in Latin American countries revealed that pre-existing programmes faced some limitations in reaching all households due to limited coverage, and the programmes are not designed to mitigate temporary income shocks (Busso et al. 2021). In some Southeast Asian countries, complicated procedures and requirements often prevent people from obtaining financial aid (Turner et al. 2021; Thanh & Duong 2022). Several studies also found that many informal workers do not receive any social assistance, even though the governments have introduced new social grant policies that are claimed to have a better targeting rate (Alam et al. 2021; Bassier et al. 2021; Komin et al. 2021; Pitoyo et al. 2021; Rwafa-Ponela et al. 2022; Soheli et al. 2022). In addition, some are excluded from social assistance due to gender factors and socio-cultural status, so this discrimination substantially increases the deprivation of vulnerable populations (Adom et al. 2020; Khambule 2020; Lenshie et al. 2021; Singh & Kaur 2022).

Arguably, a large proportion of informal workers is challenging to handle COVID-19 and its after-effects in certain regions. Implemented (unplanned) non-pharmaceutical interventions, which can cut off the income sources of informal workers, are becoming less effective at controlling virus transmission as they are forced to face health risks to remain employed (Nguimkeu & Okou 2021; Banholzer et al. 2022). In many cases, several countries with a high share of informal employment cannot provide adequate stimulus packages. This situation can be related to the government's limited revenue, which affects its ability to design appropriate fiscal policies during a crisis and causes difficulties in dealing with the informal economy actors themselves (Elgin et al. 2022).

## 6 Discussion and Concluding Remarks

This review highlights that the COVID-19 pandemic and its confinement measures have disrupted the livelihoods of the informal economy. As a result, the vulnerability of the informal economy has increased significantly during this difficult time. Moreover, lower-middle income groups have the potential to fall into poverty or



**Fig. 3** Scheme of informal economy resilience during the pandemic resistance

even extreme poverty for poorer households. However, it should be noted that their vulnerability (and the level of resilience) to public health crises are disproportionate, depending on their internal characteristics, response strategies, and government interventions.

Rethinking the resilience of the informal economy due to the crisis induced by the COVID-19 pandemic can be started by looking at the pre-condition until the recovery period (Fig. 3). The COVID-19 shock, along with the lockdown strategy, exacerbates the vulnerable characteristics of the informal economy. Although the pandemic did not immediately disturb the informal economy since they had resistant mechanisms in the early time of the crisis, the ability to resist only lasts temporarily because they lack assets, savings, and work insurance that can sustain them in difficult times. The inbuilt resilience gained from the previous crisis experience is unlikely adequate to adapt to the current crisis, especially when the lockdown policy was starting to be implemented. Consequently, many tried to promote new survival strategies in response to the current crisis (e.g. collaborating with other informal workers and digitalisation).

Informal economy actors already have the capacity and adaptability to cope with crises, bringing several survival strategies and innovations during the pandemic. Still, those measures often did not enough to stabilise their condition as before the pandemic because they lost the market due to the lockdown policy and lack of resources. Moreover, they did not have access to social protection other people benefit from, such as business insurance, employment contract certainty, and compensation.

Another key factor contributing to the ability to recover after the pandemic is the informal economy governance (Khambule 2022). Lack of recognition and support would bring the informal economy to a worsening condition and even collapse. Moreover, it makes them unprepared for possible crises in the future. Otherwise, if the informal economy could respond, adapt, and be supported with good

governance, it would allow them to recover quickly, bounce back better, and possibly become resilient to disruptive crises in the future. Importantly, this situation does not mean directing people to return to pre-disaster levels (recreate similar vulnerability) but rather carrying out reform efforts to enhance livelihoods (Chen 2020).

The COVID-19 pandemic challenges the informal economy governance, particularly in enhancing their resilience in the face of economic downturn resulting from restrictions on activities. The challenges of improving livelihood security are rising to the surface to deal with the complexity of these issues. These efforts need to pay attention to the pillars of resilience, which consist of: (1) anticipating livelihood challenges, (2) reducing the effects of past and present shocks or stressors, (3) recovering from the effects of past and present shocks or stressors, and (4) thriving even in the context of a difficult livelihood environment (Nyamwanza 2012).

The COVID-19 pandemic also creates a window of opportunity for improving welfare and social justice and stabilising the livelihoods of the informal economy. Most traditional safety nets were not enough to help them cope with distress since the main problem was mismatching in delivering this programme. Data collection on informal workers is needed as a first step to prevent them from collapsing. Discourse for transition to a formal economy tends to escalate to mitigate future shocks. The government should encourage informal economy actors to register in the official database system as part of the formalisation strategy. To make this way, non-governmental organisations concerned with informality issues can assist in this process (Komin et al. 2021; Alam et al. 2021). However, the idea of formalisation of the informal economy is still debatable. On one side, it will create a decent work environment following what is echoed in the Sustainable Development Goals (SDGs). Still, it must be followed by the commitment of the government to provide financial insurance, fulfil workers' rights, and provide infrastructure support. Burdening financial responsibilities, lack of public trust and weak governance can hinder formalisation initiatives.

Due to the ongoing pressure of this sector, informal workers have developed many forms of adaptive capacity, which equip them for larger crises. However, they are still vulnerable to crises such as COVID-19 due to a lack of access to risk protection. These ongoing stressors may also erode their response capacity, leaving them with limited resources. Therefore, an alternative strategy to improve the resilience of the informal economy is to increase the existing capabilities of the same business sector. In this situation, initiatives to boost productivity might include vocational training, the introduction of a digital ecosystem to grow the market, and financial help (Kimuli et al. 2021; Koloma 2021; Vu & Ho 2022). Amid the era of disruption, informal workers are increasingly required to have agile characteristics to survive. In addition, high adaptability is needed in responding to unpredictable changes, so informal workers must also be equipped with business management skills and financial literacy (Ravikumar et al. 2022).

Uneven impacts and responses among informal economy groups perhaps lead to a disproportionate recovery process. Severe consequences are often reported in certain groups whose unique needs are ignored and under-incorporated in policy design. Hence, vulnerability reduction should also promote an inclusive and non-discrimination approach. For instance, the formulation of gender-sensitive policies plays a crucial role in ensuring the sustainability of the livelihoods of women informal workers in

times of crisis. Fairness of treatment and prevention of exploitation in the workplace should also be applied to other segments, such as migrant workers or people who are systematically marginalised in socio-cultural identities. Therefore, proactive participation and engagement of vulnerable groups in social dialogue is the key to realising a comprehensive and equitable protection system (Dudzai & Wamara 2021).

The resilience of the informal economy is believed to be dynamic over time and space. Within the same group, informal economy resilience might differ between physical spaces (e.g., rural–urban) and social groups (e.g., men and women, migrant and non-migrant, and other socio-cultural groups). In the context of time, it is also volatile according to the dynamics of social distancing policies, where restriction easing increases the ability of the informal workers to rise, while policy tightening exacerbates their vulnerability. Resilience may evolve through development and an individual's interaction with the environment (Kim-Cohen & Turkewitz 2012). These circumstances may support the individual's resilience (Southwick et al. 2014).

The most important lesson from various studies of the impacts of COVID-19 on informal workers is that the policy response to the pandemic must consider their existence. Inappropriate policies managing multiple institutional demands create a new wave of 'disaster', as evidenced by their multilevel and multifaceted impacts, particularly on poor communities who depend on the informal economy for their livelihoods. The lockdown relaxation is also associated with the gradual recovery of economic activity. Still, handling structural problems is fundamental to transforming the informal economy towards positive changes.

This article reviews studies that primarily focus on implications during the early or peak phases of the pandemic, where the degree of volatility and ambiguity strongly characterises unusual decision-making mechanisms. However, the studies reviewed here are also commonly conducted in less developed countries, so comparing the informal sector in developed countries could enrich the understanding of how the dynamics of this activity during a crisis induced by the pandemic since it is believed that there are clear distinctions between the two types of countries (Gërxhani 2004). For the following study, it is essential to capture the ability of the informal economy to leap forward during the economic recovery or after the pandemic so that it will fill the puzzle of understanding their resilience to global health disasters.

**Acknowledgements** The author would like to thank Associate Professor Ilan Wiesel, who has provided input on the substance of this research, and also Lambang Septiawan, who has proofread this article. We would also like to thank The Indonesia Endowment Funds for Education (LPDP) for providing financial support for writers.

**Funding** Open Access funding enabled and organized by CAUL and its Member Institutions. Open access funding enabled and organised by The University of Melbourne. No funding was received to assist with the preparation of this manuscript.

**Data Availability** The data used is with the authors and can be available upon demand.

## Declarations

**Conflict of interest** The authors confirm that this research is original and that there is no conflict of interest for this research.

**Ethical Approval** There are no human subjects in this research, and informed consent is not applicable.

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## References

- Acevedo, I., F. Castellani, G.L. Id, and M. Sze. 2021. Informality in the time of COVID-19 in Latin America: Implications and policy options. *PLoS ONE* 16(12): e0261277. <https://doi.org/10.1371/journal.pone.0261277>.
- Addai, I. 2011. Estimating remittances in the informal sector labour market in a developing economy: A micro-level evidence on Kayayoo migrants in Kumasi. *Ghana. Social Sciences* 6(4): 313–317. <https://doi.org/10.3923/sscience.2011.313.317>.
- Adom, D., J. Adu-mensah, and P. Appiah. 2020. Hand-to-mouth work culture and the COVID-19 lockdown restrictions: experiences of selected informal sector workers in Kumasi. *Ghana* 1(2): 45–63.
- Agyei, Y.A., E. Kumi, and T. Yeboah. 2016. Is better to be a *kayayei* than to be unemployed: Reflecting on the role of head portering in ghana's informal economy. *GeoJournal* 81: 293–318. <https://doi.org/10.1007/s10708-015-9620-z>.
- Akuoko, P.B., V. Aggrey, and A. Amoako-Arhen. 2021. Ghana's informal sector in the face of a pandemic. *Social Science & Humanities Open* 3: 100094.
- Alam, S., and M.A. Baten. 2021. Assessing vulnerability of informal floating workers in Bangladesh before and during COVID-19 pandemic: a multi-method analysis. *Benchmarking: an International Journal* 29(5): 1677–1702. <https://doi.org/10.1108/BIJ-06-2021-0329>.
- Alexander, D.E. 2013. Resilience and disaster risk reduction: An etymological journey. *Natural Hazards and Earth System Sciences* 13: 2707–2716. <https://doi.org/10.5194/nhess-13-2707-2013>.
- Alkire, S., R. Nogales, N.N. Quinn, and N. Suppa. 2021. Global multidimensional poverty and COVID-19: A decade of progress at risk? *Social Science & Medicine* 291: 114457. <https://doi.org/10.1016/j.socscimed.2021.114457>.
- Anazonwu, N.P., K.E. Nnamani, N. Osadebe, C.C. Ezeibe, P.O. Mbah, T.C. Nzeadibe, N.P. Anazonwu, and K.E. Nnamani. 2021. State actors, human rights violations and informal livelihoods during the COVID-19 Pandemic in Nigeria. *Territory, Politics, Governance*. <https://doi.org/10.1080/21622671.2021.1976262>.
- Armansyah and Sukamdi. 2021. Formalisation of the informal sector: Process, influential factors, and effects on informal workers in Palembang City. *Jurnal Kependudukan Indonesia* 16(1): 67–80.
- Azeez, A., D.P. Negi, A. Rani, and S. Kumar. 2021. The impact of COVID-19 on migrant women workers in India. *Eurasian Geography and Economics* 62(1): 93–112. <https://doi.org/10.1080/15387216.2020.1843513>.
- Banholzer, N., S. Feuerriegel, and W. Vach. 2022. Estimating and explaining cross-country variation in the effectiveness of nonpharmaceutical interventions during COVID-19. *Scientific Reports* 12: 7526. <https://doi.org/10.1038/s41598-022-11362-x>.
- Bassier, I., J. Budlender, R. Zizzamia, M. Leibbrandt, and V. Ranchhod. 2021. Locked down and locked out: Repurposing social assistance as emergency relief to informal workers. *World Development* 139: 105271. <https://doi.org/10.1016/j.worlddev.2020.105271>.
- Béné, C., R.M. Al-Hassan, O. Amarasinghe, P. Fong, J. Ocran, E. Onumah, R. Ratuniata, T. van Tuyen, J.A. McGregor, and D.J. Mills. 2016. Is resilience socially constructed? Empirical evidence from Fiji, Ghana, Sri Lanka, and Vietnam. *Global Environmental Change* 38: 153–170. <https://doi.org/10.1016/J.GLOENVCHA.2016.03.005>.

- Bigos, M., Qaran, W., Fenger, M., Koster, F., Mascini, P., & van der Veen, R. 2013. Review essay on labour market resilience. *INSPIRES Working Paper Series No. 1*.
- Blanton, R.G., and D. Peksen. 2021. A global analysis of financial crises and the growth of informal economic activity. *Social Science Quarterly* 102(4): 1947–1965. <https://doi.org/10.1111/ssqu.12952>.
- Bolin, B., and L.C. Kurtz. 2018. Race, class, ethnicity, and disaster vulnerability. *Handbooks of Sociology and Social Research*. [https://doi.org/10.1007/978-3-319-63254-4\\_10](https://doi.org/10.1007/978-3-319-63254-4_10).
- Booth, A., A. Sutton, and D. Papaioannou. 2016. *Systematic approaches to a successful literature Review*. London: SAGE Publication Ltd.
- Braam, D.H., S. Srinivasan, L. Church, Z. Sheikh, F.L. Jephcott, and S. Bukachi. 2021. Lockdowns, lives and livelihoods: The impact of COVID-19 and public health responses to conflict affected populations – a remote qualitative study in Baidoa and Mogadishu. *Somalia. Conflict and Health* 15(1): 1–11. <https://doi.org/10.1186/S13031-021-00382-5>.
- Brata, A.G. 2010. Vulnerability of urban informal sector: Street vendors in Yogyakarta Indonesia. *MPRA Paper No.12541* 14: 47–58.
- Busso, M., J. Camacho, J. Messina, and G. Montenegro. 2021. Social protection and informality in Latin America during the COVID-19 pandemic. *PLoS ONE* 16(11): e0259050. <https://doi.org/10.1371/journal.pone.0259050>.
- Carpenter, S.R., F. Westley, and G. Turner. 2005. Surrogates for resilience of social–ecological systems. *Ecosystems* 8(8): 941–944. <https://doi.org/10.1007/s10021-005-0170-y>.
- Chamaratana, T., H. Daovisa, and B. Promphakping. 2018. Transforming informal workers’ assets into their livelihoods: A case study of garment workers in the Lao PDR. *Pertanika: Journal of Social Sciences and Humanities* 26(3): 1419–1431.
- Chen, M. 2020. COVID-19, Cities and urban informal workers: India in comparative perspective. *The Indian Journal of Labour Economics* 63(1): 41–46. <https://doi.org/10.1007/s41027-020-00254-1>.
- Coletto, D., L. Jaber, and L. Vanhellemont. 2021. Street vendors in Lima in the time of COVID-19: Guilty or oppressed? *The Canadian Geographer* 65(4): 435–447. <https://doi.org/10.1111/cag.12712>.
- Coulthard, S. 2011. More than just access to fish: The pros and cons of fisher participation in a customary marine tenure (Padu) system under pressure. *Marine Policy* 35(3): 405–412. <https://doi.org/10.1016/J.MARPOL.2010.11.006>.
- Crdenas, J., J. Montana, and D. Bosworth. 2021. Which workers are most exposed to COVID-19 and social distancing effects in a dual labour market? *Revista De Economía Del Rosario* 24(2): 1–44. <https://doi.org/10.12804/revistas.urosario.edu.co/economia/a.10549>.
- Danso-Wiredu, E.Y. 2021. Saving for one another: The informal economy of subsistence among the urban poor in Ghana. *GeoJournal* 86: 1287–1299. <https://doi.org/10.1007/s10708-019-10123-0>.
- Das, T., and D. Das. 2020. COVID-19 and economic loss of first phase of 21-day lockdown in India. *Space and Culture India* 8(1): 21–26. <https://doi.org/10.20896/saci.v8i1.844>.
- Davoudi, S., K. Shaw, L.J. Haider, A.E. Quinlan, G.D. Peterson, C. Wilkinson, H. Fünfgeld, D. McEvoy, L. Porter, and S. Davoudi. 2012. Resilience: A bridging concept or a dead end? “Reframing” resilience: Challenges for planning theory and practice interacting traps: Resilience assessment of a pasture management system in Northern Afghanistan urban resilience: What does it mean in planning practice? Resilience as a useful concept for climate change adaptation? The politics of resilience for planning: A cautionary note. *Planning Theory & Practice* 13(2): 299–333. <https://doi.org/10.1080/14649357.2012.677124>.
- Dos Santos, F.G., L.C. de Santana Ribeiro, and R.B. de Cerqueira. 2020. The informal sector and Covid-19 economic impacts: The case of Bahia. *Brazil. Regional Science Policy & Practice* 12(6): 1273–1285. <https://doi.org/10.1111/RSP3.12366>.
- Dudzai, C., and C.K. Wamara. 2021. COVID-19 pandemic and the informal sector in Zimbabwe. *African Journal of Social Work* 11(4): 201–208.
- Dzawanda, B., M. Matsa, and M. Nicolau. 2021. Poverty on the rise: The impact of the COVID-19 lockdown on the informal sector of Gweru. *Zimbabwe. International Social Science Journal* 71(Suppl 1): 81–96. <https://doi.org/10.1111/ISSJ.12285>.
- Egana-delSol, P., G. Cruz, and A. Micco. 2022. COVID-19 and automation in a developing economy: Evidence from Chile. *Technological Forecasting and Social Change* 176: 121371. <https://doi.org/10.1016/j.techfore.2021.121373>.
- Elgin, C., C.C. Williams, G. Oz-Yalaman, and A. Yalaman. 2022. Fiscal stimulus packages to COVID-19: The role of informality. *Journal International Development* 34(4): 861–879. <https://doi.org/10.1002/jid.3628>.

- Endress, M. 2015. The social constructedness of resilience. *Social Sciences* 4: 1–13. <https://doi.org/10.3390/socsci4030533>.
- Foster, J., M. Chasomeris, and D. Blaauw. 2021. Revisiting car guarding as a livelihood in the informal sector. *Development Southern Africa* 38(5): 769–784. <https://doi.org/10.1080/0376835X.2021.1891862>.
- Garzón-Duque, M.O., M.D. Cardona-Arango, F.L. Rodríguez-Ospina, and A.M. Segura-Cardona. 2017. Informality and employment vulnerability: Application in sellers with subsistence work. *Revista De Saúde Pública* 51(89): 1–17. <https://doi.org/10.11606/S1518-8787.2017051006864>.
- Gërçhani, K. 2004. The informal sector in developed and less developed countries: A literature survey. *Public Choice* 120: 267–300. <https://doi.org/10.1023/B:PUCB.0000044287.88147.5e>.
- Guan, D., D. Wang, S. Hallegatte, S.J. Davis, J. Huo, S. Li, Y. Bai, T. Lei, Q. Xue, D.M. Coffman, D. Cheng, P. Chen, X. Liang, B. Xu, X. Lu, S. Wang, K. Hubacek, and P. Gong. 2020. Global supply-chain effects of COVID-19 control measures. *Nature Human Behaviour* 4(6): 577–587. <https://doi.org/10.1038/s41562-020-0896-8>.
- Guo, F., Y. Huang, J. Wang, and X. Wang. 2022. The informal economy at times of COVID-19 pandemic. *China Economic Review* 71: 101722. <https://doi.org/10.1016/j.chieco.2021.101722>.
- Hartmann, C., C. Hegel, and O. Boampong. 2022. The forgotten essential workers in the circular economy? Waste picker precarity and resilience amidst the COVID-19 pandemic. *Local Environment* 27(10–11): 1272–1286. <https://doi.org/10.1080/13549839.2022.2040464.s5>.
- Helgeson, J.F., P. Aminpour, J.F. Fung, A.R. Henriquez, A. Zycherman, D. Butry, C. Nierenberg, and Y. Zhang. 2022. Natural hazards compound COVID-19 impacts on small businesses disproportionately for historically underrepresented group operators. *International Journal of Disaster Risk Reduction* 72: 102845. <https://doi.org/10.1016/j.ijdrr.2022.102845>.
- Hijzen, A., A. Kappeler, M. Park, and C. Schwellnus. 2017. *Labour market resilience: The role of structural and macroeconomic policies*. (Economics Department Working Papers No. 1406). Organisation for Economic Co-operation and Development. [https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=ECO/WKP\(2017\)38&docLanguage=En](https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=ECO/WKP(2017)38&docLanguage=En).
- Holling, C.S. 1973. Resilience and stability of ecological systems. *Annual Review of Ecology and Systematic* 4: 1–23. <https://doi.org/10.1146/annurev.es.04.110173.000245>.
- ILO. 2018. *Women and men in the informal economy: A statistical picture*, 3rd ed. Geneva: ILO.
- ILO. 2020. *Impact of lockdown measures on the informal economy*. Geneva: International Labour Organization.
- ILO. 2015. *R204—Transition from the informal to the formal economy recommendation, 2015* (No. 204). Available at: [https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100\\_ILO\\_CODE:R204](https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:R204).
- ILO. 2017. *R205—Employment and Decent Work for Peace and Resilience Recommendation, 2017* (No. 205). Available at: [www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100\\_ILO\\_CODE:R205](http://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:R205).
- Jaskova, A. 2017. Is informal employment a safety net in times of crisis? Evidence from Serbia. *Journal of Human Resource Management* 20(1): 11–20.
- Jiang, Y., J.R. Laranjo, and M. Thomas. 2022. COVID-19 lockdown policy and heterogeneous responses of urban mobility: Evidence from the Philippines. *PLoS ONE* 17(6): e0270555. <https://doi.org/10.1371/JOURNAL.PONE.0270555>.
- Kahlayar, N., B. Ouattara, and S. Fethi. 2020. The impact of financial crisis on the informal economy the Turkish case. *Athens Journal of Business Economics*. <https://doi.org/10.30958/ajbe.6-2-4>.
- Khambule, I. 2020. The effects of COVID-19 on the South African informal economy: Limits and pitfalls of government's response. *Loyola Journal of Social Sciences* 34(1): 91–109.
- Khambule, I. 2022. COVID-19 and the informal economy in a small-town in South Africa: Governance implications in the post-COVID era. *Cogent Social Sciences*. <https://doi.org/10.1080/23311886.2022.2078528>.
- Kim-Cohen, J., and R. Turkewitz. 2012. Resilience and measured gene-environment interactions. *Development and Psychopathology* 24(4): 1297–1306. <https://doi.org/10.1017/S0954579412000715>.
- Kimuli, S.N.L., K. Sendawula, and S. Nagujja. 2021. Digital technologies in micro and small enterprise: Evidence from Uganda's informal sector during the COVID-19 pandemic. *World Journal of Science, Technology and Sustainable Development* 18(2): 93–108. <https://doi.org/10.1108/WJSTSD-02-2021-0017>.



- Koloma, Y. 2021. COVID-19, financing and sales decline of informal sector MSMEs in Senegal. *African Development Review* 33(S1): S207–S220. <https://doi.org/10.1111/1467-8268.12532>.
- Komin, W., R. Thepparp, B. Subsing, and D. Engstrom. 2021. Covid-19 and its impact on informal sector workers: A case study of Thailand. *Asia Pacific Journal of Social Work and Development* 31(1): 80–88. <https://doi.org/10.1080/02185385.2020.1832564>.
- La Porta, R., and A. Shleifer. 2014. Informality and development. *Journal of Economic Perspectives* 28(3): 109–126. <https://doi.org/10.1257/jep.28.3.109>.
- Lenshie, N.E., M.M. Joshua, and C. Ezeibe. 2021. COVID-19 pandemic and informal women workers in peri-urban communities in Nigeria. *Local Environment* 26(6): 754–769. <https://doi.org/10.1080/13549839.2021.1923001>.
- Leyva, G., and C. Urrutia. 2022. Informal labor markets in times of pandemic. *Review of Economic Dynamics*. <https://doi.org/10.1016/j.red.2022.01.002>.
- Mago, W. 2018. Understanding sustainable livelihood strategies of informal traders: A case of Mount Frere, Eastern Cape. *Dissertation*. Bloemfontein: University of the Free State.
- Malak, M.A., S.F. Prema, A.M. Sajib, and N.J. Hossain. 2022. Livelihood of independent waste pickers (Tokai) at Dhaka City in Bangladesh: Does it incidental choice of them? *Indonesian Journal of Geography* 54(1): 92–104. <https://doi.org/10.22146/ijg.65461>.
- Mayar, K., D.G. Carmichael, and X. Shen. 2022. Resilience and systems—A review. *Sustainability* 14(14): 1–22. <https://doi.org/10.3390/su14148327>.
- McLaughlin, P., and T. Dietz. 2008. Structure, agency and environment: Toward an integrated perspective on vulnerability. *Global Environmental Change* 18(1): 99–111. <https://doi.org/10.1016/j.gloenvcha.2007.05.003>.
- Mehrotra, S. 2009. The impact of the economic crisis on the informal sector and poverty in East Asia. *Global Social Policy* 9(1): 101–118. <https://doi.org/10.1177/1468018109106887>.
- Mohan, D., R. Sekhani, J. Mistry, S. Mishra, A. Singh, V. Mittal, R. Pachauri, S. Chindaliyan, and T. Mohan. 2022. Gauging the impact of a pandemic on the lives and livelihoods of female domestic worker across Indian cities. *International Journal of Health Sciences* 6: 11653–11672. <https://doi.org/10.53730/ijhs.v6nS3.8784>.
- Mondal, M., and C. Chakraborty. 2022. The analysis of unparalleled struggle for existence of urban women informal workers in West Bengal, India for survival and resilience to COVID-19 pandemic risk. *Geo-Journal* 87(Suppl 4): 607–630. <https://doi.org/10.1007/s10708-022-10620-9>.
- Narula, R. 2020. Policy opportunities and challenges from the COVID-19 pandemic for economies with large informal sectors. *Journal of International Business Policy* 3(3): 302–310. <https://doi.org/10.1057/s42214-020-00059-5>.
- Nasution, N., S. Sarmini, W. Warsono, W. Wasino, and F.A. Shintaswiwi. 2021. Using coping strategies of informal sector traders amid COVID-19 in Indonesia for social studies teaching materials on realising SDGs. *Journal of Social Studies Education Research* 12(3): 144–174.
- Ndouna, F.K., R.T. Nanfosso, J.A.B. Essimi, and L.F. Ambassa. 2021. The informal sector facing COVID-19: The case of Cameroon. *Sustainability* 13(23): 1–17. <https://doi.org/10.3390/su132313269>.
- Nguimkeu, P., and C. Okou. 2021. Does informality increase the spread of COVID-19 in Africa? *A Cross-Country Examination*. *Applied Economics Letters* 29(12): 1111–1115. <https://doi.org/10.1080/13504851.2021.1910128>.
- Nyamwanza, A.M. 2012. Livelihood resilience and adaptive capacity: A critical conceptual review. *Jambá Journal of Disaster Risk Studies* 4(1): 1–6. <https://doi.org/10.1111/ijlr.12332>.
- Ogando, A.C., M. Rogan, and R. Moussie. 2021. Impacts of the COVID-19 Pandemic and unpaid care work on informal workers' livelihoods. *International Labour Review*. 22(1): 171–194. <https://doi.org/10.1111/ilr.12332>.
- Omobowale, A.O., O.K. Oyelade, M.O. Omobowale, and O.S. Falase. 2020. Contextual reflections on COVID-19 and informal workers in Nigeria. *International Journal of Sociology and Social Policy* 40(9): 1041–1057. <https://doi.org/10.1108/IJSSP-05-2020-0150>.
- Pelling, M., and D. Manuel-Navarrete. 2011. From resilience to transformation: The adaptive cycle in two Mexican urban centers. *Ecology and Society* 16(2): 11.
- Pike, A., S. Dawley, and J. Tomaney. 2010. Resilience, adaptation and adaptability. *Cambridge Journal of Regions, Economy and Society* 3(1): 59–70. <https://doi.org/10.1093/cjres/rsq001>.
- Pitoyo, A.J., B. Aditya, I. Amri, and A.A. Rokhim. 2021. Impacts and Strategies Behind COVID-19-Induced Economic Crisis: Evidence from Informal Economy. *Indian Journal of Labour Economics* 64(3): 641–661. <https://doi.org/10.1007/s41027-021-00333-x>.

- Pitoyo, A.J., B. Aditya, and I. Amri. 2020. The impacts of COVID-19 pandemic to informal economic sector in Indonesia Theoretical and empirical comparison. *E3S Web of Conferences*. <https://doi.org/10.1051/e3sconf/202020003014>.
- Proag, V. 2014. The Concept of Vulnerability and Resilience. *Procedia Economics and Finance*. 18: 369–376. [https://doi.org/10.1016/S2212-5671\(14\)00952-6](https://doi.org/10.1016/S2212-5671(14)00952-6).
- Ravikumar, T., M. Sriram, M. Girish, R. Anuradha, and M. Gnanendra. 2022. Financial stress, financial literacy, and financial insecurity in India's informal sector during COVID-19. *Investment Management and Financial Innovations* 19(2): 285–294. [https://doi.org/10.21511/imfi.19\(2\).2022.25](https://doi.org/10.21511/imfi.19(2).2022.25).
- Rothenberg, A.D., A. Gaduh, N.E. Burger, C. Chazali, I. Tjandraningsih, R. Radikun, C. Sutera, and S. Weilant. 2016. Rethinking Indonesia's informal sector. *World Development* 80: 96–113. <https://doi.org/10.1016/j.worlddev.2015.11.005>.
- Rwafa-Ponela, T., S. Goldstein, P. Kruger, A. Erzse, S.A. Karim, and K. Hofman. 2022. Urban informal food traders: A rapid qualitative study of COVID-19 lockdown measures in South Africa. *Sustainability* 14(4): 1–18. <https://doi.org/10.3390/su14042294>.
- Saleh, Y. 2021. ICT, social media and COVID-19: Evidence from informal home-based business community in Kuwait City. *Journal of Enterprising Communities: People and Places in the Global Economy* 15(3): 395–413. <https://doi.org/10.1108/JEC-07-2020-0131>.
- Sassen, S. 1994. The informal economy: Between new developments and old regulations. *The Yale Law Journal*. <https://doi.org/10.2307/797048>.
- Schwarz, A.M., C. Béné, G. Bennett, D. Boso, Z. Hilly, C. Paul, R. Posala, S. Sibiti, and N. Andrew. 2011. Vulnerability and resilience of remote rural communities to shocks and global changes: Empirical analysis from Solomon Islands. *Global Environmental Change* 21(3): 1128–1140. <https://doi.org/10.1016/J.GLOENVCHA.2011.04.011>.
- Simões, M., J.S. Andrade, and A. Duarte. 2022. Human capital and labour market resilience: A regional analysis for Portugal. *Applied Spatial Analysis and Policy*. <https://doi.org/10.1007/s12061-022-09465-z>.
- Singh, N., and A. Kaur. 2022. The COVID-19 pandemic: Narratives of informal women workers in Indian Punjab. *Gender, Work and Organization* 29(2): 388–407. <https://doi.org/10.1111/gwao.12766>.
- Skinner, C., V. Watson, and W. South. 2020. Planning and informal food traders under COVID-19: The South African case. *Town Planning Review* 92(3): 301–3018. <https://doi.org/10.3828/tpr.2020.38>.
- Sohel, S., B. Hossani, K.M. Alam, R. Shabbir, M.K. Sifullah, and M.M.B. Mamy. 2022. COVID-19 induced impact on informal migrants in Bangladesh: A qualitative study. *International Journal of Sociology and Social Policy* 42(5): 473–497. <https://doi.org/10.1108/IJSSP-02-2021-0046>.
- Southwick, S.M., G.A. Bonanno, A.S. Masten, C. Panter-Brick, and R. Yehuda. 2014. Resilience definitions, theory, and challenges: Interdisciplinary perspectives. *European Journal of Psychotraumatology* 5: 25338. <https://doi.org/10.3402/ejpt.v5.25338>.
- Sultana, N., M.M. Rahman, and R. Khanam. 2022. The effect of the informal sector on sustainable development: Evidence from developing countries. *Business Strategy & Development*. <https://doi.org/10.1002/bsd2.217>.
- Sumalatha, B.S., L.D. Bhat, and K.P. Chitra. 2021. Impact of Covid-19 on informal sector: A study of women domestic workers in India. *The Indian Economic Journal* 69(3): 441–461. <https://doi.org/10.1177/00194662211023845>.
- Swarna, N.R., I. Anjum, N.N. Hamid, G.A. Rabbi, T. Islam, E.T. Evana, N. Islam, M.I. Rayhan, K.A.M. Morshed, and A.S.M. Juel Miah. 2022. Understanding the impact of COVID-19 on the informal sector workers in Bangladesh. *PLoS ONE* 17: 1–20. <https://doi.org/10.1371/journal.pone.0266014>.
- Thanh, P.T., and P.B. Duong. 2022. The COVID-19 pandemic and the livelihood of a vulnerable population: Evidence from women street vendors in urban Vietnam. *Cities* 130: 103879. <https://doi.org/10.1016/j.cities.2022.103879>.
- Thulare, M.H., and I. Moyo. 2021. COVID-19 and street traders in the City of uMhlatuze, KwaZulu-Natal, South Africa: On responses and adaptation mechanisms. *Cogent Social Sciences*. <https://doi.org/10.1080/23311886.2021.2006392>.
- Thulare, M.H., I. Moyo, and S. Xulu. 2021. Systematic review of informal urban economies. *Sustainability* 13(20): 11414. <https://doi.org/10.3390/su132011414>.
- Toriro, P., and I. Chirisa. 2021. Vendors on wheels! The changing terrain and manifestation of informality in Harare under Covid-19 pandemic restrictions. *Cogent Social Sciences*. <https://doi.org/10.1080/23311886.2021.1939230>.
- Turner, S., C.J. Langill, and N.B. Nguyen. 2021. The utterly unforeseen livelihood shock: COVID-19 and street vendor coping mechanisms in Hanoi, Chiang Mai and Luang Prabang. *Singapore Journal of Tropical Geography*. s42(3): 484–504. <https://doi.org/10.1111/sjtg.12396>.

- Usamah, M., J. Handmer, D. Mitchell, and I. Ahmed. 2014. Can the vulnerable be resilient? Co-existence of vulnerability and disaster resilience: Informal settlements in the Philippines. *International Journal of Disaster Risk Reduction* 10: 178–189. <https://doi.org/10.1016/J.IJDRR.2014.08.007>.
- Vu, H.V., and H. Ho. 2022. Analysis of Factors influencing credit access of Vietnamese Informal labors in the time of COVID-19 pandemic. *Economies* 10(1): 1–12. <https://doi.org/10.3390/economies10010008>.
- Wasima, S., and M.N. Rahman. 2022. Economic Vulnerability of the underprivileged during the COVID pandemic: The case of Bangladeshi domestic workers. *Journal of Social Service Research* 48(2): 163–175. <https://doi.org/10.1080/01488376.2022.2029799>.
- Wijayaningtyas, M., K. Lukiyanto, E. Nursanti, and D.I. Laksmna. 2022. The effect of economical phenomenon on informal construction workers earnings within Covid-19 pandemic: A mixed method analysis. *Heliyon* 8(8): e10321. <https://doi.org/10.1016/j.heliyon.2022.e10321>.
- Zhanda, K., N. Garutsa, M.A. Dzvimbo, and A. Mawonde. 2022. Women in the informal sector amid COVID-19: Implications for household peace and economic stability in urban Zimbabwe. *Cities & Health* 6(1): 37–50. <https://doi.org/10.1080/23748834.2021.2019967.s>.

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