



CITY RESILIENCE STRATEGIES IN DEALING WITH THE AFTERMATH OF THE COVID-19 PANDEMIC: USING SOCIO-ECOLOGICAL SYSTEMS

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ABSTRACT

This study addresses the critical problem of urban vulnerability exposed by the Covid-19 pandemic, aiming to identify and evaluate effective resilience strategies within urban environments. Utilizing a qualitative descriptive methodology, this research draws on an extensive review of literature and environmental observations to analyze the strategies employed by cities in response to the pandemic. The study focuses on the socio-ecological systems approach, exploring how it can be applied to strengthen urban resilience. The findings reveal that resilience can be significantly enhanced through strategies that emphasize community engagement, adaptive governance, and the development of sustainable infrastructure. These insights provide valuable guidance for policymakers and urban planners in crafting resilient cities capable of withstanding future crises. The study concludes that a holistic, community-driven approach is essential for fostering urban resilience in the face of global challenges.

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1. INTRODUCTION

The countries order changes due to the coronavirus disease 2019 (Covid-19). This Global Pandemic has created enormous challenges for the world. Cities almost all over the world said they were affected by shock due to the emergence of this virus, including Indonesia. The massive spread throughout continents, Europe, Asia, America, and Africa forced the World Health Organization (WHO) to declare this disease a global pandemic that started in early March 2020. Since Covid-19 was declared a global pandemic, it has forced the world to implement lockdown and social distancing policies for some time, which can have significant implications for various sectors, especially the economic sector.

Despite the various challenges caused by Covid-19, this phenomenon can allow city leaders to learn lessons to build a resilient city from an economic, social and environmental perspective. One of the factors that trigger this is that in 2045, it is estimated that there will be an increase in population, and 65 per cent of the world's population will live in cities (Bappenas, 2019). According to research conducted by the OECD, with 1.4 million people arriving in cities every week, the world population living in cities and urban areas is expected to increase to around 70 per cent by 2050 (Gonçalves, 2018). In line with that, the World Bank also estimates that 220 million people in Indonesia will live in cities by 2045.

The mobility crisis in urban areas increases the complexity of the problems because having many people in cities will bring more challenges, such as economic shock management, waste management, transportation management, air pollution problems and can trigger an increase in crime rates. Research conducted by Rizki stated that mobility factors in the city of Jakarta had a positive influence on increasing the spread of Covid-19 (Ghiffar, 2020).

To face these problems, city leaders need to plan for emergencies in the short term and respond to shock resilience in the long term. The presence of Covid-19 itself provides an opportunity for cities to learn from experience in eradicating the virus so that they are better prepared to face emergencies in the future. The unprecedented impact of the pandemic on every aspect of urban life has provided compelling data and information on improving crisis response and recovery strategies. In the future, not only will health facilities and disaster response facilities be ready, but public facilities such as conference halls, shopping places, government offices, pedestrian areas, and transportation facilities also need to be considered (Rosalina, 2020). That way, if an emergency situation threatens the future, it can be immediately anticipated with comprehensive authorization and continuity by considering aspects of urban resilience to move towards a resilient city. A city's resilience can be seen from the condition of the city when it faces challenges and shocks, such as during the current pandemic, how the city can recover and grow and expand in size. In a tough city, there is a diverse community, including poor, vulnerable groups, and well-off groups. The dynamic relationships between these groups will strengthen the city's ability to face the pressures and crises it is experiencing (Semarang, 2016). Based on this understanding, multidimensional implications require cities to be resilient to all pressures and shocks caused by external and internal factors.

As the theory put forward by Jack F. Ahern in the "safe to fail" perspective states, resilience is not understood as returning to normality or conforming to its original state but as the ability of complex ecosystems or socio-ecological systems (Ahern, 2011), for example, cities and towns. Urban communities adapt to change, and these changes respond to the tension of internal and external pressures (Carpenter et al., 2005). To respond to this theory, the environmental activist Stockholm Environment Institute (SEI) proposed the socio-ecological system in 1988 as a strategy or solution for implementing sustainable development. This system covers three factors that influence the human life system: society, economy and environment.

As explained in the background above, the problem formulation for this research can be formulated: What is the city's resilience strategy in facing the post-Covid-19 pandemic using a socio-ecological system? Based on the theory put forward by Jack F. Ahern, the researcher intends to study further by connecting the concept of urban resilience to the implications of the impact of the Covid-19 pandemic by providing strategies related to these problems (Suhada, 2015).

2. RESEARCH METHODS

This research uses a qualitative descriptive method to interpret the phenomenon of urban resilience during the Covid-19 pandemic, as this approach allows for a detailed and nuanced understanding of complex socio-ecological interactions. Data collection for this research involved a comprehensive literature review of articles, books, journals, and scientific writings, supplemented by environmental observations to provide context and validate findings. The data analysis technique involved content analysis, where raw data were processed, classified, and analyzed qualitatively to identify key themes and patterns related to urban resilience strategies (Firdaus et al., 2020).

The scope of this study is limited to examining urban resilience strategies within the context of the Covid-19 pandemic, focusing on socio-ecological systems. The study does not cover other types of disasters or resilience frameworks, which may be explored in future research. The description of the conceptual framework in this research is related to the concept of city resilience in facing the post-Covid-19 pandemic using a socio-ecological system to provide strategies for these problems. Thus, the strategy used leads to Folke's theory (Folke et al., 1996) where the socio-ecological system has three elements that determine sustainable development, namely economic resilience, consumer (society) behavior, and the environment.

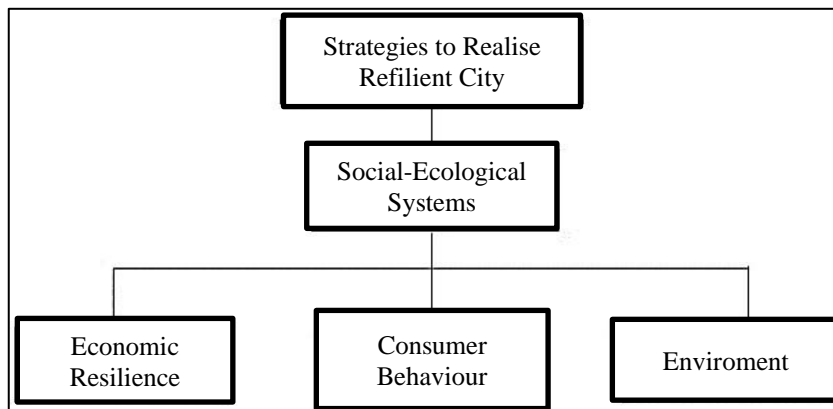


Figure 1. Socio-Ecology Strategy Chart
Source: Author (2021)

3. RESULTS AND DISCUSSION

The Concept of Urban Resilience in Other Countries

Reported on the Citylab page in its article entitled "Pandemics are Also an Urban Problem", states that the factor in the formation of cities is disease. This statement is based on the experience of London Metropolitan planning, wherein, in the 19th century, there was a spread of cholera outbreaks. To respond to this, they built a sanitation network based on city planning and management to solve the crisis that threatened various aspects of life (Klaus, 2020).

Around 1908, the city of Philadelphia faced repeated outbreaks of typhoid and cholera that killed many people. To improve the city, officials decided to take the first step by turning the park along the riverbank, Fairmount Park, into a fortress or river protector for waste disposal channels. The park will also be used as a green open space in the future, which will be used for recreation or just sports (Rinde, 2020). Furthermore, in the City of Helsinki, Finland, in overcoming the impact of the Covid-19 crisis, they used a functional city approach with three principles: smart city, inclusive city and sustainable city. At the same time, the focus lies on improving the quality of life, strengthening energy security, and increasing mobility. These three principles form the basis of the recovery plan for the city of Helsinki.

The city of Vienna, the capital of Austria, was also affected by the negative impact of the pandemic. To overcome the impact of Covid-19, the Vienna city government adopted a crisis management and resilience development model. Where initiatives are adopted to develop and reuse buildings such as hospitals and housing to create emergency infrastructure and free up resources. In addition, city and community leaders have taken a series of "post-crisis living" measures to strengthen communities against future shocks. For example, neighbourhood telephone networks organize daily assistance for vulnerable elderly or remote residents without family support (PWC, 2020). London, Philadelphia, Helsinki and Vienna are prominent examples and can be learned as lessons for other cities during recovery. City leaders can add value at each stage of the framework sequence by helping their cities navigate the current crisis.

Strategy for Realizing a Resilient City Using a Socio-Ecological System

Based on the explanation above regarding the steps taken by other countries in facing the crisis to continue to realize urban resilience, it would be good if Indonesia could imitate or at least take an example by adapting it to the conditions and structure of each city in Indonesia. The following socio-ecological strategies can be considered in urban resilience are Economic Resilience (Resilience City), Consumer Behavior (Society), and Environment.

The first of socio-ecological strategies is Economic Resilience (Resilience City). Strategies for realizing economic resilience can adapt from an evolutionary approach related to the adaptive cycle model of panarchy theory (Simmie & Martin, 2010; Hill et al. 2010). In the evolutionary approach, cities are assumed to be examples of complex adaptive systems. This means city resilience is dynamic and interconnected, developing in many ways and varying by adapting to internal and external influences. Thus, a resilient urban economy will be one solution that can absorb and accommodate extreme shocks or successfully create new socio-economic structures (Simmie & Martin, 2010). There are eleven variables of economic resilience, according to Moore.

First, cities have leaders who can optimize the service needs of the general public, especially people with low incomes in the city, while increasing the naturalness of the urban environment. Second, there is an adequate green zone area, and efforts are being made to expand green open space (RTH) continually. Apart from that, it is equipped with a development pattern for residential use zones, business centres and office areas in one mixed area, making the city more dynamic. Third, we have a model for developing low-emission industrial areas because the positive externalities obtained during the Covid-19 pandemic will only last long if we provide regulations regarding the impact of carbon emissions from factories. Fourth, the city government must have a program for recycling items that can be recycled. Fifth, a program should reduce sustainable car use, such as making bus transportation fast, cheap, and comfortable while considering health protocols. Building cycling lanes and policies or regulations is also essential to create a conducive city. Also, pedestrian walkways are in the city centre and around shopping centres (Moore, 1994). To realize this strategy, cities need to partner and collaborate with the central government, citizens, NGOs, academia and the private sector in a multi-stakeholder approach to ensure a consistent set of policies and coordinated actions. Cities must also become more self-sufficient and innovative, involving all stakeholders in crisis response and recovery planning.

Based on research conducted by the OECD, a coordinated response by all levels of government, both in federal and unitary systems, can minimize crisis management failures because the government cannot meet the demands of crisis management alone. So when the Covid-19 crisis occurred, it was a reminder of its scope and magnitude that levels of government strengthened their partnerships with each other, the private sector and citizens.

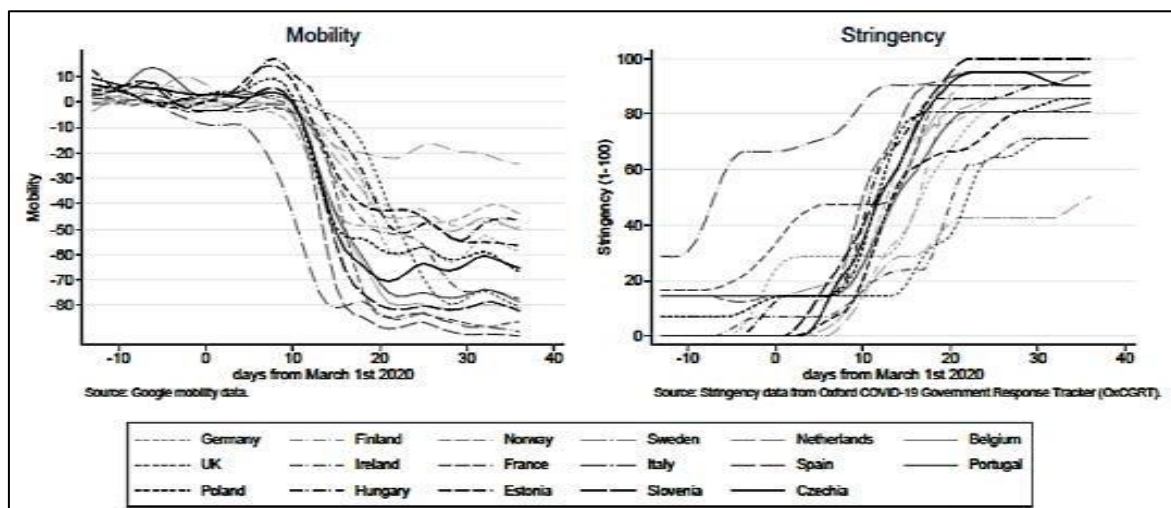


Figure 2. Policy Tools at The Core of a Successful Exit Strategy
Source: OECD (2021)

The research showed that 90 percent of respondents said local governments reported that coordination in the design and implementation of actions among all levels of government was very important. 79 percent mentioned additional financial resources for sub-national entities as also very important. Communication with the public and the possibility of adapting measures to local situations were also considered key to the success of a strategy or plan.

In addition, trust is also a fundamental factor analyzed in economics, such as its effect on tax collection. As reviewed by Giuliano & Rasul, reported on the Voxeu website by Bargain & Aminjonov (2020), citizens' level of trust in government results in greater compliance with government response measures. Mobility restriction measures, for example, are more effective when public trust is high.

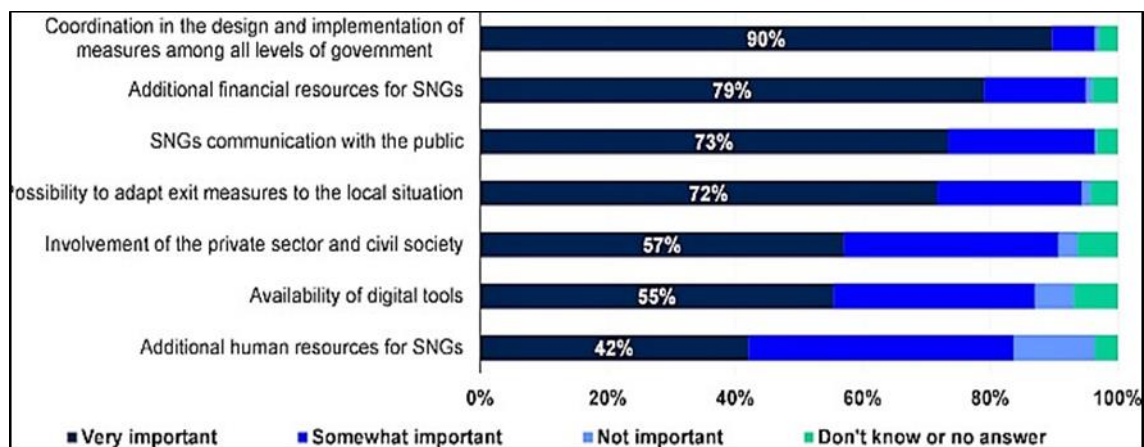


Figure 3. Daily mobility and Lockdown Stringency in Europe around March 2020
Source: OECD (2021)

For example, in the United States, an increase in certain strictness or social restrictions is associated with a more significant decrease in mobility, where trust is relatively strong. Therefore, there is a greater likelihood of a decrease in the spread of pandemic numbers. In Europe, compliance with public health policies is also higher because the level of trust is also high (Bargain & Aminjonov, 2020).

This further highlights the importance of successful multilevel governance. Each level of government relies on the others for different aspects of policy and service design and delivery to manage the impact of Covid-19. At the same time, ensuring policy success will depend mainly on city leaders and their ability to provide solutions. Citizen trust can play a role in ensuring compliance with government response measures to reduce the impact of this pandemic (OECD, 2021). However, what needs to be noted is that while this crisis can increase the level of citizens' trust in the government, the challenge for public officials is to continue building and maintaining it. Trust can easily be lost quickly, but it takes years to build that trust (Edelmen, 2020).

The second of socio-ecological strategies is consumer behavior (society). The current shift in consumer behaviour cannot be avoided because people tend to consider cleanliness and comfort factors. In this way, consumers change shopping patterns by utilizing social media, namely e-commerce. In line with this, economic experts have also predicted this behaviour change, namely that when the Covid-19 outbreak ends, people's consumption patterns will continue to use e-commerce or online media to buy goods and daily necessities. If this change continues or is prolonged, it could affect traditional shops, which will start to lose interest.

Therefore, it is necessary to develop a strategy that leads to Think New Normal (post-Covid-19). The strategies are include: Firstly, you must be careful in responding to the shift in consumer behaviour patterns towards the use of online media to buy necessities and other needs to increase the number of online markets. In this way, business actors need to implement a DTC (direct-to-customer) channel model, not just rely on already available marketplaces. Secondly, pay attention to the pattern of most consumers; in Muslim-majority countries, for example, products or goods with a halal label will be of particular concern to consumers considering the cleanliness and comfort factors. Thirdly, rebranding is needed to build an image and add proportional value or increase spiritual value. Thus, brands can create a spiritual connection with consumers because they are a solution that provides a feeling of comfort or security to consumers. Fourth, with the rise of food delivery services due to shifts in consumer behaviour patterns, various businesses need to change the perspective that previously sometimes became a habit and previously just pleasure into an opportunity. So that existing markets will grow further, and those that have yet to start can be changed, for example, by using online catering services. Fifth, there is a need to improve the features of official stores in various types of marketplaces so that businesses will be increasingly in demand by consumers (Hatta, 2020).

The third of socio-ecological strategies is environment. Strategies for environmental resilience in cities can use a circular economy model, which aims to design waste. The circular economy is based on the idea that there is no such thing as waste. To achieve this, the product is designed to be durable (quality and suitable materials are used) and optimized for reuse, facilitating handling and transformation or renewal. That way, post-Covid-19, cities can take the initiative to develop and reuse several buildings, such as hospitals and housing units, to create emergency infrastructure. If buildings (buildings) still need to be completed or are still in the planning stage, residential functions and building floor coefficients can be added. This is done so that development planning can continue to be carried out due to the influence of the property sector on business actors. Reuse and upgrade of buildings should be prioritized over demolition, and construction waste should be recycled wherever possible. This strategy can be implemented if there is cooperation between the government, stakeholders and the community. The definition of the model used is the same as that applied in the city of Vienna, where development is reused.

In developed countries, many cities are moving towards clean electrification and intelligent energy grids to reduce their carbon footprint and work towards net zero emissions. However, this requires long-term investments that may not be financially feasible for developing countries. Therefore, it is first necessary to address essential infrastructure gaps and invest in renewable energy infrastructure, which can also promote job creation and economic growth (Hui, 2021).

When discussing a city in developing and developed countries, it is close to the concept of city resilience itself. As explained in the description above, city resilience is a sensibility issue because the factors are related to the human life system. In particular, if it is related to the global Covid-19 pandemic, this discussion will remain uncertain because it depends on the most significant factor in the pandemic, namely humans or society or ourselves as perpetrators. Even though it cannot be predicted when the pandemic will end, the government, especially city leaders, must take policies or develop strategies comprehensively and continuously; if similar conditions recur, these policies or strategies can mitigate the impacts.

Therefore, to respond to this problem, this researcher uses a strategy from the socio-ecological system, namely the relationship between ecology and social systems or other systems with elements in the form of economic resilience, consumer (community) behaviour and the environment. With all the perspectives out there, these three elements are considered one of the strategies that can create a city of religiosity.

4. CONCLUSION

Urban resilience is an issue of sensibility because it involves human life and all aspects of it. To deal with the shifts and changes that occurred after the Covid-19 global pandemic, it is necessary to formulate strategies or policies related to this. This research uses a socio-ecological system to respond to problems related to a city's resilience post-Covid-19 era. The strategy leads to three system elements: economic resilience, consumer behaviour and environment.

Urban resilience strategies are implemented in other countries by creating sanitation networks, riverbank recovery, intelligent cities, inclusive and sustainable cities, crisis management, and development resilience. Meanwhile, urban resilience strategies that can be considered to be applied in our country include economic resilience strategies such as the expansion of Green Open Space and the construction of bicycle lanes and their rules, Think New Normal (post-Covid-19) strategies by paying attention to the comfort, safety and hygiene aspects of a product, and environmental strategies such as reuse and renewal of buildings. Although Indonesia still needs to be optimal in making strategies or policies related to urban resilience, it is currently entering a period of economic recovery by providing various stimuli and policies to communities affected by the Covid-19 pandemic.

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