

Dynamic Model of Resilient Village (*Kampung Tangguh*) System in the New Normal

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Abstract—The purpose of this study is to construct a resilient village model in Indonesia during the Covid-19 pandemic as the new normal. This study uses systems thinking approach and systems dynamics as an analysis tool. The findings of this study indicate that first, villages cannot stand alone to be resilient. It can't provide health services directly, nor other basic services such as education and the economy. In fact, the impact has affected aspect of health, economy, socio-culture and education aspect. Second, the existence of a varied typology of villages requires different focus on handling, so that the policy strategy is different. Third, the dynamic model of resilient villages has two major sub systems, there are internal and external village. The internal consist of village government, village community and local wisdom element. While the external sub systems are third parties, the local and central government support. Causal interactions are influence the realization of village resilient. The limitation of study is require extra time to find a leverage to make recommendation for resilient village. The model and leverage expected to be used as a basis for formulating robust policies in the field of local government and disaster governance in Indonesia at the future.

Keywords—local government, village, governance, robust policy, systems thinking

I. INTRODUCTION

The concept of resilience refer to the building of the communities capacity who face a wide range of rapid shocks and slow on set stresses in the context of disaster [1]. This is relevant with uncertainties conditions associated with the impact of covid-19 pandemic. The latest update on covid-19 cases in Indonesia was 291 thousand cases. As many as 219 cases were cured while 10,856 died. This pandemic has a complex impact on community's lives not only in urban but also in rural areas too [2]. This complexity is also accompanied by the uncertainty of when it will end. Since March, until October 2020, this pandemic has not ended. Even though Indonesia has implemented a new normal.

One of the inevitable impacts of the Covid-19 outbreak is in the economic field. People in East Java have experienced the decline in economic activity as a result of the epidemic. As many as 57.1% of people thought that their family's economic

condition was worse than last year, 10.8% even said it was much worse. The majority (65.9%) blamed Covid-19 for the cause. Those with an income below 2 million / month felt the most of the decline in the family economy. The worst conditions were experienced in Probolinggo, Mojokerto City, Banyuwangi, Blitar and Surabaya City [3].

The complexity of the impact and the uncertainty will lead to worsening conditions on a national scale. The 2019 UB Covid Task Force study said that this condition would have the potential to cause chaos, loss of socio-political and cultural costs [4], to an economic recession. The latest potential has been conveyed by Sri Mulyani as Indonesia's finance minister [5]. In addition, Indonesia's have vast territory, large population, limited state funds and government officials. Therefore are not possible for the government to handle the impact of the pandemic in the new normal era alone. Furthermore, cooperation between the sub-systems or element is necessary.

Resilient village is very important to realize, considering the most of the Indonesian population lives in villages. Then the food supply chain exists in it too [6]. Disconnected food supplies and low food security are not only detrimental to rural but also urban communities. In addition, if health and education services as basic needs are also affected, it will be ensured that the welfare of rural communities will increase then before.

In order to minimize the impact of the Covid-19 pandemic in the new normal, it is very important to study resilient village. Therefore, a model construction is needed to increase performance of resilience village system in facing disasters in Indonesia. Based on this background, the problem that can be formulated is how to construct a resilient village model in Indonesia. It is expected, can be useful in formulating disaster governance policy at the future.

II. METHODS

A. Research Design

The design of this study uses system dynamic combined with qualitative methods. The systems dynamic method is a part of systems thinking approaches. Systems thinking language is circular rather than linear, focusing on closed interdependencies. Thus the research in the system thinking approach aims to explain the relationship between the sub-systems that exist in the resilient village system model.

B. Data Analyzes

The data were analyzed using the system dynamic method of Coyle [7], but stopped at the third stage. First stage is problem recognition; second, problem understanding & system description and the third is Qualitative analysis stages While the type of data source is secondary data, based on study of UB Covid-19 task force 2020. The location in Malang city and regency, while the respondents is village community especially community unit in hamlet (*Rukun Warga/RW*). The system is the whole interaction between the elements of an object within a certain environment that works to achieve the goal. Thus in this study what is meant by the object is a resilient village system, while the environmental boundary is the village. Meanwhile, the elements that interact are those involved in resilient villages as a system i.e.: village capacity, support of local government, support of central government and support of third parties such as higher institution or NGOs.

III. RESULTS AND DISCUSSION

A. Result

1) *Kampung Tangguh at Covid 19 pandemic condition:*

The definition of a resilient village based on previous studies [3] is the condition of an independent village community and ready to be prepared in the face of a disaster. Kampung is defined as a hamlet which is a collection of rukun warga or rukun kampung units. Thus the unit of analysis in that previous study is not just a village which is a combination of several hamlets, but is smaller, namely dusun. Meanwhile, the level of resilience of a village is influenced by seven indicators, i.e: human resources, strong logistics, robust information, resilient in health, socially, resilient in order and security and strong psychologically.

Based on the questionnaire from 49 *kampung tangguh* in Malang City and Regency, there were 4 villages not resilient at all, 2 were not resilient yet, 7 resilient enough, 28 were resilient and 8 were very resilient. The villages resilient not only in rural but also in urban too. Their located in the *kelurahan Sukoharjo, Klojen, Bareng, Kota Lama, Purwodadi, Tasikmadu, Pandanwangi, Karang Besuki, Sukun, Samaan, Blimbing, Merjosari, Sawojajar, Bunulrejo, Tunjungsekar, Mulyorejo, Oro-oro dowo, Madyopura, Kiduldalem, Bandulan, Mergosono, Gadingasri, Lowokwaru, Penanggungan,*

Tlogomas, Bumiayu, Dinoyo, Desa Sitirejo, Desa Kedok, Desa Tempursari, and Desa Karangrejo.

According to research result showing that urban village (*kelurahan*) more resilient than rural village (*desa*) [8]. In order to build the resilient capacity of a village, it was given to install toughness, because the village government doesn't have capacity and authority to do it. The installer came from external element. This can be in the form of assistance, coaching as well as training to increase community capacity in dealing with disasters. Training on human resources, encourage local community leaders to make quick and responsive decisions regarding disasters. Next, giving training on health to handling covid-19 bodies, sick people and quarantine. All cadres are connected to the hospital. Then install a food barn by providing rice assistance. Then, installing information, security, psychology and *gotong royong* culture as mutual cooperation. This can be seen in the manual and SOP for the *kampung tangguh* which have been prepared [9,10].

Furthermore, the parties who support the existence of this movement divided into four element, i.e.: higher education institutions; community organizations; local and central government. The higher education institutions consist of Brawijaya University, Malang State University, *Maulana Malik Ibrahim* as State Islamic University; and Malang Islamic University. Meanwhile, elements of local organizations are *Arema* and *Malang Bersatu Lawan Corona*. Furthermore, local government elements consist of the East Java Provincial Government, Malang Regency Government, Batu and Malang City Government. Coupled with support from elements of the central government, in this case the East Java Regional Police (*Polda*), *Polres* dan *Polresta* Malang, *Kodam V Brawijaya*, *Kodim* 0833 and 0818, and also *Korem* Baladhika Jaya.

2) *Dynamic model on Kampung Tangguh system in the new normal:* According to the systems thinking approach, the object of the system is kampung tangguh (resilient village). The unit analysis is village community different with previous study. Village is environment boundary not hamlet (dusun) anymore. The resilient village system is defined as the overall relationship between the elements that influence it. The parties involved and paying attention to the resilient village system were simplified into four element, there are village capacity; support of local government; support of central government; and support of third parties. In the village capacity sub system consist of village community and village government including norm and local wisdom [3]. Thus, their involvement is part of the resilient village system. If it is constructed as follows (Figure 1):

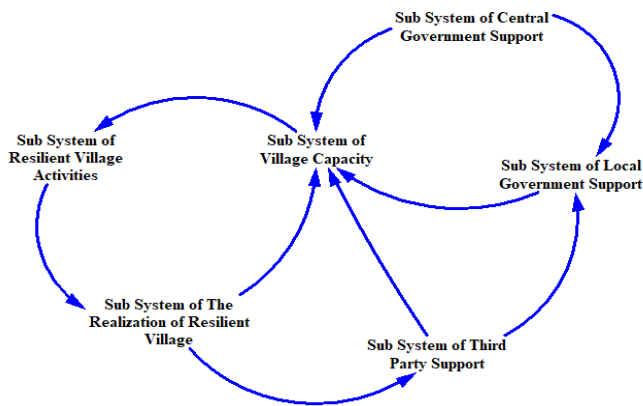


Fig. 1. Causal loop diagram of resilient village system.

Refer to that close loop diagram (CLD) is dynamic complexity so that the smaller elements are not raised but are included in the CLD. To create a resilient village, the activities of a resilient village are influenced by building village capacity. This village capacity building includes community development and village government, as well as local wisdom in it. The high and low activity of resilient villages affects the creation of resilient villages.

The level of resilience of a village affects the support of third parties (higher institutions or local organizations). Third party support influences LG support. Furthermore, local government support affects village capacity and again influences resilient village activities. then rotating circularly does not run linearly. Local government support is influenced by the support of the central government and central vertical organizations, and re-entry affects village capacity and continues. in systems thinking causes can become effects, and vice versa effects can be causes. Which element should be chosen first to accelerate the realization of a resilient village depends on the characteristics and conditions of the village. This can be obtained by performing a simulation, namely continuing the analysis of Coyle [7] in the fourth and fifth stages. However, this research stopped at the third stage. The hope is that further research can be carried out. Thus the limitation of this study is limited time.

One of these elements is the resilient village activity. These activities are influenced by the village capacity building sub system. Thus the operational definition of the resilient village sub-system is the relationship between the village capacity building and the disaster-impact sub-system. The higher of village capacity building, the resilient village activity will increase. Furthermore the resilient activity of a village increases, the impact of the disaster is lower. Conversely, if the village capacity building is low, the resilience of a village will decrease and the resulting impact will increase. the lower the impact of the disaster, the more resilient it is, in facing disasters in the new normal era. Here's the figure 2.

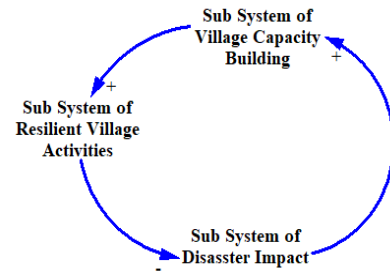


Fig. 2. Causal loop diagram sub system of resilient village activity.

B. Discussion

The dynamic model of the resilient village system in the new normal is a construction of the implementation of the *kampung tangguh* movement in Malang Raya which was initiated by the UB Covid 19 Task Force [4]. This construction was generated using a conceptual basis and research methods that were different from the previous version. *Kampung tangguh* during pandemic dominantly using sociology perspective, while model of *kampung tangguh* system refer to public administration science.

This resilient village dynamic model relies on the concept of systems thinking which is rooted in the management approach. The management approach is used in public administration in order to achieve organizational goals. The goal of the resilient village is to produce self-reliance and preparedness for rural communities to face disasters, especially in the new normal. Therefore, it is appropriate to construct it, as a strategy in decision making. This dynamic model is also supported by the concept of local government, especially village government. The core of management approach in public administration is organization.

Substantially, *kampung tangguh* during the pandemic was a form of movement and not a program, so it focused on mutual cooperation (*gotong royong*). *Kampung Tangguh* uses the theory of "social movement" as the basis for the movement. Social movement theory is an interdisciplinary study within the social sciences that generally seeks to explain why social mobilization occurs, the forms under which it manifests, as well as potential social, cultural, and political consequences. Usually social movements do not have stable goals. It depend on event. It is usually incidental and unsustainable. Hanif [11] stated that the main problem of village government is one of the aspects of public management, namely relying on the mobilization of village communities and government structures above them, such as the sub-district head (Camat), TNI and Polri in the form of *babinsa* and *babinkamtibmas*. Thus what is produced is not participation. Mobilization is short-term, while participation tends to be long-term because it based on self-awareness. In addition, this dynamic model of resilient villages in the new normal strengthens the previous dynamic model of the village government system [12] that the village is sub system of the local government which cannot achieve its organizational goals by itself. On the other hand, robust policy

is long-term. To produce a robust policy, a system dynamic is appropriate to solve the problem.

Dynamic model of resilient village trying achieved the goal within system. Resilience is achieved within a system who has supportive aspect such as economic, infrastructure, ecological, and social. That includes multiple activities, interactions and relationships. It working within complex systems are communities and putting local people, who are able to act within their sphere of influence [1]. Resilient village made up by communities, while resilience communities made up by resilient individual who are well organized, who have access to infrastructure and services, economic opportunities, and can manage their natural asset. The resilience of community will be greatly increased by strong connections with external actors who provide wider supportive environment supply goods and services when needed. So, that's why dynamic model of *kampung tangguh* system have supporting from external actors such as, higher institution, NGO, local and central government.

Local and central governments support is regulations, assistance, human resources, and funding so that the community is resilient. While from third parties it can be in the form of assistance such as that carried out by the Covid 19 UB task force. Please do not leave the village organization as "bowl" for a community. Therefore building community resilience cannot be separated without building the capacity of village organizations. Resilient village system depend on interaction of their systems. The sociological approach complements the public administration science. This is because public administration is an applied science. It requires other disciplines to solve public problems.

IV. CONCLUSION

Dynamic model of resilient village are made up by sub systems. There are sub system of resilient villages activity, village capacity, realization of resilient village, support of local government and central government, and sub system of third party role. The management approach required to make an effective decision making on disaster, while the sociological approach is complementary to solving public problems. Local government support is a long-term strategy for realizing resilient village as a system.

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