

Community Empowerment Model to Flooding Risk Reduction in Palembang City (A Case Study of Gotong Royong Program)

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Community Empowerment Model to Flooding Risk Reduction in Palembang City (A Case Study of *Gotong Royong* Program)

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Abstract. Palembang, as the capital city of South Sumatera, is one of the cities in Indonesia that flooded almost every year. The Palembang city government has run several programs to overcome this problem, such as formulating environmental policies, construct pumping plant, and normalization. Moreover, Palembang City Government since 2015 promoted mutual cooperation program called *Gotong Royong* aimed at tackling waste issue and river rehabilitation. However, the main cause of this problem has not been fully resolved because of poor communication and engagement. Therefore, the purpose of this research is to find out public perception about the *Gotong Royong Program* and design a model of community empowerment to flooding risk reduction in Palembang City. Data were collected by deep interviews, documentations, and observations. The results of the research suggest that if *Gotong Royong* are to proliferate, close attention must be paid to public participation, attitudes, and knowledge towards flood management, collaboration among local government, communities, and NGOs.

1. Introduction

Palembang is dominated by peat swamp plains with rainfall of 1,500-3,200 mm per year [1]. This condition has a big influence on the potential for flood disasters. The surface water discharge in the Palembang region is strongly influenced by the flow rate of the Musi River in the southern of Sumatera Island. The floods that occurred in Palembang initially only inundated the suburbs. However, due to the development of Palembang City which reclaims swamp land, the intensity and discharge of floods are getting bigger. Besides that, the increase in the incidence of flooding was also followed by an increase in inundation depth [2].

The Palembang City Government has made efforts to reduce the risk of flood disasters both structurally and non-structurally [3]. Since 2015, the government of Palembang City has had a flagship program, namely by utilizing social culture empowerment capital in the form of mutual cooperation. This program is called *Gotong Royong* Program. The moral movement initiated by the Mayor of Palembang for the period 2013 to present has focused on locations that have flood problems, including those caused by sedimentation from piles of garbage or mud in waterways or tributaries of the Musi river.

Community empowerment aims to develop the potential and independence of the community in facing social and environmental problems where they live [4]. The community empowerment process requires the participation of the community, community and government policies in order to act effectively to improve the quality of life and the environment [5]. Although researchers use a lot of



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community empowerment strategies in the field of social development [6], it seems that there is no universally accepted model or measurement tool because the conditions of the community differ according to their environmental conditions [7]. The sustainability of community empowerment-based activities depends on the community's own perception of the plan of a program. Community attitudes and their responsibilities are determinants of participation and commitment to social change [8].

Exploring the public's perception of the Palembang City Government Mutual Assistance Program in an effort to reduce the risk of flooding is felt to be very important. Based on the background of the problems described above, the main problems can be formulated in examining the mechanism for implementing the Mutual Cooperation Program, namely (1) how the community perceives the *Gotong-Royong* Program and (2) what is the relevant model for community empowerment through the *Gotong Royong* Program.

2. Literature review

The empowerment method focuses on achieving goals and changing systems by making use of the strengths, resilience, and available resources. By focusing on social competences, empowerment models support development to remove social barriers for society. Therefore, the community empowerment system has been applied in various studies related to environmental issues. For example, a study by Arifudin et al [9] discussed community empowerment programs to prevent forest fires on Indonesia's peatlands. This study proposes a community empowerment program concept by taking into account the balance between community resources and program objectives as sustainable development. Hadiyanti [10] also examines a group approach in empowering the community through waste recycling activities related to human resource development in Jakarta. The community empowerment model in this study illustrates how the conditions of the government, society, and the business world (CSR) can collaborate well in carrying out community empowerment program commitments. Osti [11] highlights community empowerment as one of his recommendations for flood disaster risk management. The sustainability of flood infrastructure projects, such as levees or dams, can be improved with the participation of the community. Tarchiani et al [12] proposed an Early Warning System (EWS) for community participation-based preparedness for flood risks. This study aims to show that community empowerment-based SPD can be formed by utilizing existing resources, local stakeholders, and knowledge about the impact of floods.

3. Methods

This research uses a quantitative descriptive analysis approach with explanatory research. Explanatory research aims to obtain information, information and data regarding things that are not yet known [13]. The data used in this study consisted of primary data and secondary data. Primary data obtained from questionnaires, interviews, and observations. Meanwhile, secondary data were obtained from literature studies related to environmental management issues and *Gotong Royong* Program policy in Palembang City.

The selections of respondents in this study using purposive sampling method. Purposive sampling is a non-random sampling technique by determining specific characteristics [14]. The target respondents were 109 Neighborhood Associations where the *Gotong Royong* Program was implemented, spread throughout the Palembang area. The number of samples was determined using Cochran method [15]. The formula of this sample size method can be seen in the following equation:

$$S = \frac{Z^2 \times p(1-p)}{d^2} \quad (1)$$

Where Z is the acceptable probability of error. Generally, the Z -Score is set at 1.96, p is the expected conversion ratio and d is the expected absolute precision level. The researcher observed that the level of community participation in mutual cooperation activities carried out by the Palembang City Government was 30%. This figure is obtained from the assumptions and observations of researchers who have participated in this mutual cooperation program since 2015 until now. The level

of precision (d) absolute expected is 0.1% and p is 0.3%, so the minimum sample size in this study are 81 samples.

4. Results

4.1. Community perceptions of gotong royong program

Environmental perception is a person's interpretation of the environment which is based on the person's cultural background, reasoning and experiences [16]. This results in everyone having a perception about the quality of the environment that is different from one another. In the context of the mutual cooperation program launched by the Palembang City Government, it contains the meaning of community empowerment which is expected to inspire a spirit of mutual assistance in terms of environmental management. Based on survey results, Palembang communities generally know that there is an obligation to participate in the mutual cooperation activities to clean their environment. There are 80% of respondents who answered that there is an obligation for the community to participate in mutual cooperation activities, 6% respondents answered that they did not know, and 14% of respondents answered that they did not. Meanwhile, regarding the availability of the community to be involved in the *Gotong Royong* Program, the survey results showed that 67% of respondents were willing to be involved in mutual cooperation activities, 32% of respondents said they were sometimes willing, and 1% of respondents said they were not willing.

People's perceptions of the environment cannot be separated from the knowledge system and social changes that occur in their lives [17]. Social changes that occur in society can change their perceptions and perspectives on the environment [18]. It is hoped that the environmental conditions before and after the *Gotong Royong* activity will change the habits and independence of the community in protecting the environment. Based on the results of the questionnaire data about whether the *Gotong Royong* Program is useful for reducing the risk of flooding, it was found that 95% of respondents stated that the *Gotong Royong* Program was useful for reducing the risk of flooding, 2% of respondents stated that this program was not useful, and 3% of respondents said they did not know whether this program is useful or not.

4.2 Community empowerment model of gotong royong program

This research model was designed based on the problems of the *Gotong Royong Program*. This model consists of three parts, namely input, process, and output. Government, community, and community organizations are three important elements in the implementation of the program so that it is used as input, which is expected to collaborate well in carrying out a community empowerment program commitment in efforts to reduce flood risk. Process and output in this model is a follow-up of available input as a form of implementation by parties related to community empowerment programs. Policy makers or the government could empower the community by providing inform the procedures related to the *Gotong Royong Program*, providing equipment to support mutual cooperation activities, and encouraging local community organizations to help increase community participation and enthusiasm. With community participation, the government will obtain information about various problems that occur in their environment, so that the community can assist the government in creating development policies and managing flood disasters effectively. Therefore, it is expected that the public can actively provide criticism and suggestions because it is very necessary in the formulation of policies. In order for the community to participate effectively, the government must empower local residents by providing education, training and professional advisers on issues of healthy living, good environmental management, causes and consequences of flooding. It is important for the public to understand well about this, so that they have self-awareness to encourage them to change bad habits into good habits that can help flood prevention programs. In addition, the role of community organizations is needed to evaluate government policies, analyze the conditions and potential of the social environment, and increase public enthusiasm. The success of community empowerment programs is largely determined by the extent to which inputs (government, community, and community organizations) participate fully.

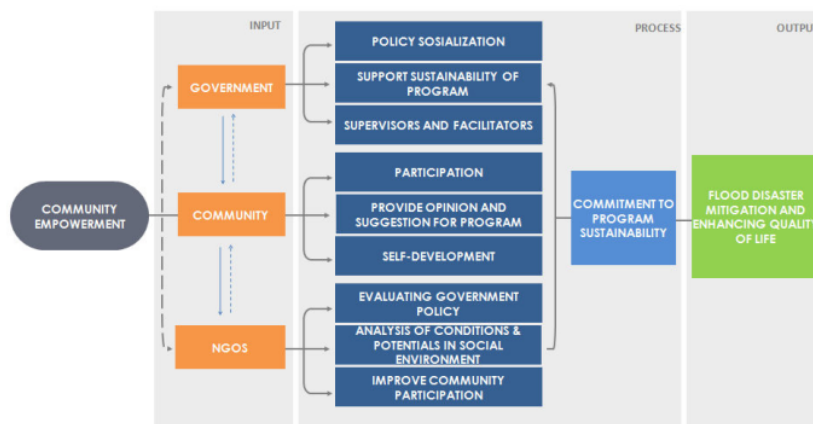


Figure 1. Community empowerment model for gotong royong program

5. Discussion

This study explores people's perceptions of the Palembang City Government Mutual Cooperation Program. The results showed that the majority of respondents knew their rights and obligations to participate in mutual cooperation activities, and around 67% of respondents stated that they were willing to participate in mutual cooperation activities in an effort to reduce the risk of flooding in Palembang City. Public awareness and perception of environmental issues is very important because it affects the acceptance of environmental policies and changes in positive behavior in society [19]. Bustan [20] in research on community perceptions and participation of the environment shows that community perceptions and participation in environmental conservation are categorized into two groups. The first group stated that they contributed both personally and financially, while the second group only followed instructions from government and local leaders. Based on the survey results in this study, the people of Palembang City carry out mutual cooperation activities following directions or instructions from the government and village heads. The process of measuring empowerment must begin with a clear theoretical understanding of the concept of empowerment, different levels of analysis (government, organizations, and communities), and the domains or factors that affect its effectiveness. Hadiyanti [10] formulated a community empowerment model begins by describing how the conditions of government, society, and Corporate Social Responsibility (CSR) can collaborate well in carrying out community empowerment programs. The results of the formulated model are expected to achieve community independence and develop human resources in the aspects of knowledge, attitudes and skills.

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