

Identification of Waste Bank Management System based on Community Participation: Case Study - Waste Bank Simfoni Village Watutumou Kabupaten Minahasa Utara

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Abstract: Community participation is one of the elements that allow a community to develop and achieve progress. At present participation needs to be developed by utilizing technology. This study aims to describe the process of empowerment and community participation in the waste management system through the principle of the 3R waste bank in the Bank Simfoni Garbage Watutumou Village, North Minahasa Regency, North Sulawesi Province. This type of research is descriptive. Observation, interviews and documentation were collected. Data testing and analysis is done by triangulating data and classifying data systematically and then deciphering existing data in fields that describe the form of community empowerment in the waste management process. To empower the community is not easy and fast but requires a systematic process that starts from the stage of socialization, planning, implementation, and evaluation tools needed to analyze the success of community empowerment through a waste bank system. The results show that community empowerment is used as a method of managing waste through a system Waste banks have increased in terms of clean environmental quality and emerged so that public participation is increasing. It was concluded that community participation was at the implementation and participatory stage. Factors supporting waste management are determined by the involvement of members, advice and infrastructure as well as cooperation with the government and the private sector, as well as technological developments that can be used as a profitable business for waste management.

1 INTRODUCTION

Environmental problems that are currently in line with population growth in Indonesia are increasing waste generation, which is difficult to handle (BPS-Statistic Indonesia 2018). Of the 250 million inhabitants of Indonesia can produce 151,192 tons per day with the habit of Indonesians throwing their trash carelessly as much as 70.31% (United Nation #OceanAction14387 2017). This condition makes Indonesia the third highest in the world as the dirtiest country after India and China (World Bank 2019).

The 4.0 industrial revolution can be hope and challenge for Indonesia, especially in the environmental sustainability sector. Jalal explained, an observer of corporate governance and political ecology from Thamrin School of Climate Change and Sustainability, the notion of industry 4.0 in the environmental sector is where all elements improve

and favour the carrying capacity of the environment including waste management (Weick 2016).

The Minister of National Development Planning, Bambang Brodjonegoro said that the essence of the 4.0 industrial revolution was an environmentally friendly industry and in accordance with the Sustainable Development Goals (SDGs) (Gigliotti, Schmidt-Traub, and Bastianoni 2018). One of them is ensuring that the availability of energy is no longer dependent on fossil fuels. This situation allows reusing waste into one of the potential resources (Park and Chertow 2014).

North Sulawesi Province is in the centre of the world's coral triangle which in addition has abundant biodiversity potential. On the other hand, this area is also a meeting place for trash of three continents due to the ocean currents that meet in this region. The North Minahasa area, which is one of the districts located in the centre of North Sulawesi, is proliferating with various problems regarding the

increase in waste production (Allen and Werner 2002).

North Minahasa Regency is urged to fix their respective regions in order to improve the quality of the environment, of course, with the 3R principle of Reuse, Reduce and Recycle (Preston, Hileman, and Cubas 2011). In the program, the priority of activities is waste management through a waste bank. One of the ones that developed and became a pioneer was the symphonic waste bank in Watutumou village. Through the garbage bank, it is now expected to be able to help the government in handling waste problems and collaborating with the private sector and sponsors to jointly succeed the waste management program through the community-based waste bank system.

This waste bank was established in 2011 and now has shown progress in its waste management system with the main effort, namely community empowerment. The unsuccessful success is one of the reasons for researchers to examine in the form of a picture of community participation in managing waste and knowing the benefits of bank waste felt by the community.

2 METHOD

2.1 Types of Research

This type of research is descriptive quantitative, where community participation is measured in the management of waste banks. Of the eight variables measured to find the level of community participation which is then sorted according to rank. The location of the study was carried out at the Simfoni garbage bank of Watutumou village.

2.2 Subjek and Objek Research

The subjects of this study were the speakers who were interviewed by researchers while measuring the level of participation was carried out by carrying out questionnaires. The object of this research is about the procedures for managing waste banks and community participation in managing waste at the Simfoni waste bank.

2.3 Data Collection

Primary data collection is done by observation, interview and documentation methods accompanied by running questionnaires to measure community participation while secondary data is taken from

applicable regulations, internet sites and other sources.

3 ANALYSIS AND INTERPRETATION

3.1 Community Participation Process

Initially, the community had the habit of disposing of their trash everywhere so that the area was previously known as a slum and dirty area. Now, it is famous for its clean environment. Even though efforts to manage the environment have shown significant changes, the management born from the Watutumou community, which was pioneered by Mr Marlon Kamagi, felt the need to assist in cooperating with the community to participate as customers at the waste bank fully. Observation results revealed that the waste management activities in Watutumou village after the symphony waste bank was generally carried out by stages:

- First, at the household level by separating organic and inorganic waste, then bringing it to the place of the waste bank.
- Second, the planning process of the government's initial, private offer, in this case, the BUMN Pawnshop through the "The Gade" program converts waste into gold together with PLN and sponsors. The parties facilitated this region as a pilot project in waste management activities with the waste bank system. The local government and the community can accept this condition.
- Third, the agreement was then included in the form of a management decree approved by the village to obtain assistance in the form of administrative and waste management equipment.
- This process is then formulated in the form of a village regulation about waste management through a waste bank.

Dissemination of activities is carried out by inviting facilitators who have participated in the training (TOT) as well as cadres who provide counselling to invite the public to be more concerned about the environment and want to become customers in the waste bank. The socialization was divided into two activities, namely: First, the socialization of the planning stage which contained the submission of ideas/ideas regarding the strengthening of the waste bank program by providing knowledge and understanding to the community to participate in and

become part of the waste bank (management and customers). Secondly, the socialization of the management phase is aimed at the community, especially those who are selected as managers or managers of waste banks later. By providing an understanding to the community in management activities, there is no retribution fee which means that the activity is voluntary.

The process of managing a waste bank has also used internet technology with an application system called MySmash, where customers can register using smartphone technology.

Management and development carried out must refer to Law No. 18 of 2008 concerning Waste Management, Government Regulation Number 81 of 2012 concerning Management of Household Waste and Similar Waste of Household Waste, Regulation of the Minister of Environment of the Republic of Indonesia Number 13 of 2012 concerning Guidelines for Implementation of Reduce, Reuse, and Recycle (Undang-Undang Republik Indonesia 2008).

3.2 Rank of Community Participation

Concerning the level of participation of researchers gives a level as a variable size. Analysis of the level of participation in the development of a waste bank was carried out. The number of respondents in use amounted to 30 people, where the number of respondents was the community involved in managing the symphony garbage bank.

Based on the level of participation, most of the respondents actively attended discussions in the program. Seven respondents (22.58%) were in the program for the sake of their community. Six respondents (20.97%) participated and influenced to the program. Four respondents (14.52%) participated in the program for their government. Only four people did not participate in the program (12.90%). Three respondents participated in the program and shared responsibilities with their government (9.68%), and the rest was (3.23%). Participation in the program would help the authorities to make dominant decisions, plan, implement, and supervise the program. To conclude, the calculation of the level of participation is shown in the table below.

Table 1: Participation Level with Participation Ranking

Scale	N	%	Rank
Not participating	4	12,9	-
Participate but for the government only	4	12,9	-
Participate for the benefit of the community only	6	20,9	2
Take an active discussion	7	22,5	1
Participate in the implementation of the plan and give some influence	4	14,5	3
Participate in the implementation of the program and share responsibility	3	9,6	-
Participate in execution and have the authority to make dominant decisions.	1	13,2	-
Participate in program implementation and have the power to plan, implement and oversee	1	3,2	-
Total	30	100	

4 RESULT AND DISCUSSION

The results of the above analysis can be elaborated in the results of the identification of waste management programs through the waste bank program as findings that can be stated in this study, namely the supporting factors for the development of waste bank programs, namely:

4.1 Member Involvement

The garbage bank program that has been running again confirms that the new paradigm has changed the view that people who were previously objects in carrying out development. At present, the community has been used as the subject who will carry out a development. This situation is that the community is told to activate in the waste management activities in an area. With the presence of several surrounding communities who participate fully and are willing to become members to run an activity program in terms of becoming waste bank customers who have been very helpful, the process of the continuous development program is evident.

4.2 The Existence of Facilities and Infrastructure

The program for the construction of facilities and infrastructure is essential in the process of running a program. The availability of adequate facilities and

infrastructure that have been facilitated by the government and the private sector in the process of implementing the Waste Bank as a place for managing household waste is expected to be able to run smoothly and optimally on an ongoing basis. Facilities and infrastructure are needed. They are as follows: weighing instruments to weigh the garbage; vehicles to run to the communities; the storefront as a place for some items to be sold, and some containers to be used as compost. In addition, the condition of the house or a comfortable environment which is currently the place where all the managers of the Waste Bank are working will increase the activities of the management to achieve their goals to the fullest.

4.3 Public and Private Cooperation

The Cooperation Program has been carried out with the government as a companion. Support from the private sector is one form of synergy between the government and the community. The existence of this cooperation makes it easier for waste banks to carry out the programs that have been given for them. This statement has been stated in the management plan and village regulations.

4.4 Support for Technology Development

Technology contributes to the development of waste management. If the conventional method is done by collecting and carrying it to the waste management site, this can now be done through the application. Where customers only upload election results to be transacted to a garbage bank. Even the results of sales can be directly exchanged for needs such as telephone, electricity and gas pulses.

5 CONCLUSION

The definitive conclusion from this study is that:

- Simfoni Waste Bank, located in Watutumou village, can increase its regional development efforts by empowering its people to manage waste through the 3R principle. In terms of technical and institutional implementation, the garbage bank has met the feasibility standard of operation because it has referred to the applicable laws and regulations.
- Benefits obtained from community-based waste management were ecological, economic and spiritual benefits. Further studies on explorative research are needed to obtain a more suitable

formulation of community-based waste management models.

- The level of community participation is at the stage where the community has participated in activities ranging from planning to implementation of activities.

Suggestions in this study are that there is a need to increase socialization about community participation in waste management while optimizing management technology using applications. Furthermore, government and private budget support are needed because many activities can cover large areas and many new points for waste banks that require development funds.

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REFERENCES

- Allen, Gerald R., and Timothy B. Werner. 2002. "Coral Reef Fish Assessment in the 'coral Triangle' of Southeastern Asia." *Environmental Biology of Fishes*.
- BPS-Statistic Indonesia. 2018. "Environment Statistics of Indonesia 2018." *BPS-Statistics Indonesia*.
- Gigliotti, Massimo, Guido Schmidt-Traub, and Simone Bastianoni. 2018. "The Sustainable Development Goals." In *Encyclopedia of Ecology*.
- Park, Joo Young, and Marian R. Chertow. 2014. "Establishing and Testing the 'Reuse Potential' Indicator for Managing Wastes as Resources." *Journal of Environmental Management*.
- Preston, Jill C., Lena C. Hileman, and Pilar Cubas. 2011. "Reduce, Reuse, and Recycle: Developmental Evolution of Trait Diversification." *American Journal of Botany*.
- Undang-Undang Republik Indonesia, Nomor 18 Tahun 2008. 2008. "Undang Undang No. 18 Tahun 2008 Tentang Pengelolaan Sampah." *Cell*.
- United Nation #OceanAction14387. 2017. "#OceanAction14387 Indonesia Against Marine Plastic Debris." *Coordinating Ministry for Maritime Affairs of the Republic of Indonesia*.
- Weick, Vera. 2016. "Green Economy and Sustainable Development." In *Waste Management and the Green Economy: Law and Policy*.
- World Bank. 2019. "Tracking SDG 7: The Energy Progress Report." *Full Report*.