

Social transformation of winongo river bank people in managing domestic waste

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Abstract. Social transformation in managing household waste is a collective commitment to reduce the impact of climate change and realize sustainable development goals. The article aims to explain the process of social transformation in managing domestic waste and the factors that affect it. The research location is in the Winongo riverbank area of Yogyakarta through a qualitative exploration approach. As a result, the social transformation process runs through the stages of capacity building, group empowerment, relational community development, and new cultural development. The four stages do not run linearly, but tend to be dynamic and adaptive. The capacity building stage is very important because it is related to the internalization of new values on waste and its implications for the environment and health. Social transformation occurs if economic and political empowerment capital can be built to form a new culture. The factors inhibiting the transformation process are changes in the formation of actors and gender bias in domestic waste management. It takes a reorientation of the institutional format based on social capital and innovation of household waste management strategies with economic and ecological value to reduce the impact of climate change.

1. Introduction

Waste is inseparable from human life. Waste is often removed from both domestic (household) and industrial production processes and considered as a material with no value or non-valuable material to be used normally or specifically in production or use [1]. The existence of waste today becomes one of problems encountered by many countries in the world for its non-decomposable characteristic and its ever increasing quantity over years. Even, Indonesian is recorded as the largest waste producer in the world because it produces about 65.2 million ton waste. The volume of waste pile reaches 31 million ton/year 49.5% of which derives from domestic waste dominated by organic waste (40.7%) [2]. Waste volume and variation increasing continuously will have ecological, economic, and social-political

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impacts if it is not managed appropriately. Proper waste management practices are needed to be able to contribute to reducing carbon emissions and reducing the impact of climate change.

Some basic factors make the volume of waste pile increase continuously: limited knowledge and awareness of the importance of waste management and the limited waste management infrastructure available also has accelerated the growth rate of waste pile and thereby resulted in environmental and public health hazard [3]. Inappropriate waste and rubbish management, storage, collection, and disposal practices can result in serious environmental and health problems and risks [4]. In addition, limited waste management infrastructure service, lack of social pressure to prevent open waste disposal and weak law enforcement have increased the domestic waste disposal openly [5]. This will result in aesthetic losses, public health problems, and environmental pollution in the form of ground water and surface water contamination [6]. Waste burning practice done by some people also results in the exposure to hazardous substance and produces gas disposed freely to atmosphere and thereby leads to climate change [7]. Additionally, some other factors affect indirectly the growth of waste pile volume: rapid growth of urbanization, increase in migration from rural to urban areas and economic development and change of people's life style [8]. It is these factors that affect waste pile volume and variation in many countries, either directly or indirectly. Thus, a global strategy is needed to reduce waste generation so as not to adversely affect climate change and sustainable development.

Global strategy in waste management is intended to protect environment protection, do social inclusion, and to prevent concern with economic sustainability. This situation requires the state to be main actor through *command and control* approach to draft regulation and to develop innovation and technology in the term of waste management. This is similar to the history of waste management in Korea that has begun systematically and in integrated manner since 1980s through the enactment of Waste Management Law [9]. In addition to the state, civil society also plays a strategic role in waste management. It is characterized with the appearance of recycle community and network in several countries being one of important real actions in the attempt of reducing waste pile [10]. Latin America, Asia, and Africa's experiences show the attempt of integrating informal scavenger (garbage collector) group into circular economic organization to reduce waste pile sustainably [11]. There are three dominant Municipal waste management treatment/final disposal methods in Shanghai, namely, sanitary landfilling, incineration, and composting [12]. Indonesia also carries out *zero waste* movement by involving school children to improve their lifestyle into the more environment-friendly one [13] and waste donating movement (Indonesian: *gerakan sedekah sampah*) [14]. Those actions can be realized if they are implemented in collaborative manner and put household to be an important factor in transforming and changing waste-managing behaviour [3]. Thus, social transformation process can improve the weakness of technical approach in waste management at various scales.

Social transformation process to change the behaviour of managing domestic waste aims to minimize waste pile and to improve recycling attempt. This attempt is considered successful when individual's access to information and knowledge is available concerning the domestic waste management so that they are empowered to change their behaviour and to participate actively in waste management [15]. However, if the community's life has been more prosperous, particularly in urban areas, waste volume will tend to increase and the waste management problem scale will also be more complex. In addition, the domestic waste content has changed along with industrialization process and the changing lifestyle has encouraged adaptive and innovative waste management [16]. Therefore, social transformation process is also accompanied with approaches that can attract public interest and participation.

Economic approach tends to be popular to attract the household's interest and participation in waste management. This is similar to what appearing in the people in

Indonesian urban areas using economic empowerment approach in domestic waste management [17]. This not only benefits economically but is also enabled to get economic benefit [6]. The strategic formula of domestic waste management based on household's specific condition, awareness, and needs is also implemented to reduce waste volume and variation [3]. The approaches oriented toward the improved quality of sanitation and domestic health can also be used to strengthen public support in managing domestic waste [7]. Those approaches become overlapping formulas in encouraging social transformation of domestic waste management.

People in Winongo river bank in Yogyakarta City have carried out social transformation process in waste management since the reformation process in 1998. This is encouraged not only by ecological condition of dirty village (Indonesian: *kampung*) and community's behaviour of disposing wastes in the river but also by flood disaster incident being the starting point of transformation process occurring. The actors' experience with social transformation process gives important social learning to other areas to improve their quality of life. The process of social transformation in household waste management through innovative approaches can also increase participation in reducing waste generation, improving economic empowerment and environmental quality of riverbank residents. This is relevant to SDGs to reduce waste pollution having impact on clean water supply (SDGs 6) and constitutes the form of responsibility for consumption and production conducted (SDGs 12) and the management of climate change due to the impact of greenhouse gas emission resulting from organic waste pile (SDGs 13). In addition, household-based waste management also can contribute to achieving sustainable city (SDGs 11), conserving sea ecosystem (SDGs 14) and land ecosystem (SDGs 15). Considering the very close relationship between social transformation process of river bank community and waste management aimed at sustainable development goals, this research aims to explore the experience of actors involved in social transformation process and the factors affecting the social transformation process of river bank community in managing domestic wastes.

2. Method

This research used an exploratory qualitative method. Informants of research were selected using purposive sampling technique, consisting of actors in domestic waste management community in Winongo river bank areas, Living Environment Office of Yogyakarta City, private sector, and university. Techniques of collecting data used were observation, in-depth interview, FGD, and documentation. Data were validated using source and method triangulations, and then analysed using an interactive model of analysis [18]. The theoretical framework of social transformation was used to analyse data encompassing capacity building, group empowerment, relational community development and new culture development [19]. This social transformation perspective gives emphasis on the institutionalistic approach being the part of solidarity economy initiative. This idea refers to economic activity based on people's social relation and commitment to change institution, idea, rule value, and collective orientation [20]. It is through this framework that field finding and theories were discussed.

3. Result and Discussion

Rubbish and waste management has attracted serious attention and developed globally leading to the increase in environmental cost in developing countries. The efficiency of waste management is dependent on such factors as community's waste management practice and government's commitment to sustainable waste management [21]. Indonesia is one of

countries still having problem in waste management. The data of Indonesia's Ministry of Living Environment and Forestry recorded that the volume of wastes managed is 14.03 million ton in 2022, belonging to high category. It is because of people's limited knowledge and awareness of waste management. Therefore, social transformation should be realized in waste management.

Yogyakarta is crossed by three large rivers, one of which is Winongo river. Winongo river crosses six subdistricts: Tegalrejo, Jetis, Mantrijeron, Ngampilan, Gedongtengen dan Wirobrajan, consisting of 11 (eleven) urban villages (Indonesian: *kelurahan*) with 54 (fifty four) Citizen Associations (Indonesian: *Rukun Warga*). The Winongo river bank areas have been resided by migrants coming from the lower-middle economic group. There is also slum area that is 30.15 Ha wide, triggered by the position of house buildings facing away from the river and jutting out into the river body [22]. During rainy season, the Winongo river bank areas are often affected by flood and landslide due to the large water flow and the dense population settlement. Citizen's behaviour of disposing waste into the river makes the river contaminated and causes health problem [23]. This condition endangers the sustainable attempt of creating sustainable city. Therefore, transformative attempt is needed to reduce the risks due to the poorly managed waste.

The social transformation process in river bank community is divided into four stages: capacity building, group empowerment, relational community development, and new culture development [19]. The capacity building stage is influenced by the context of political chance structure and the cultural context of river bank community. Yogyakarta City government was mandated to develop its region autonomously post-reform based on potencies and resources it has. Because Yogyakarta is one of important tourist destinations in Indonesia, the city's spatial planning was carried out by making river "the city's showcase". Through publishing Local Regulation about environmental planning, the Mayor of Yogyakarta invited his people to care for and to love river by keeping it clean. The processes of campaigning and socialization were carried out by Tjoet Njak Dien NGO and Living Environment Office with women group targeted to be strategic agent in environmental planning. *Griya Rumpun* was established as a community and social learning hub concerning environment-friendly values including the importance of waste management [23]. The activity of *Griya Rumpun* is fairly dynamic. They developed Waste Management Training Program in collaboration with Agency for Living Environment (Indonesian: *Badan Lingkungan Hidup* or BLH). The socialization of Law of Domestic Abuse (Indonesian: UU KDRT) in collaboration with Agency for Women and Community Empowerment (Indonesian: *Badan Pemberdayaan Perempuan dan Masyarakat* or BPPM) and Training for Cooperative Administration in collaboration with Department of Industry and Trade (Indonesian: *Departemen Perindustrian dan Perdagangan* or Deperindag). The three trainings are based on their concern with the slum condition of village, particularly in the edge of Winongo river made the waste disposal place. By managing waste in order to have economic value, *Griya Rumpun* is expected to empower its members.

The Mayor of Yogyakarta's obsession is supported not only by the availability of adequate city park but also by the availability of community-based waste management. It aims mainly to change the behaviour of disposing waste into river by managing waste using waste bank scheme. It is this community that becomes a strategic actor to invite the people in river bank to be responsible for waste produced by each of households. This attempt is taken with an assumption that environmental problem, particularly waste in river bank, relates to human problem so that the community capacity building approach can create new ecological behaviour [24]. Thus, the starting point of social transformation can be carried out.

There are four important points in the community capacity building in waste management: knowledge, commitment, vision, and social practice. Household unit

becomes an important subject in implanting environment-friendly values in order to be applied in the social practice of managing waste appropriately. Human behaviour can be regulated by social norms enacted. If the behaviour of disposing waste haphazardly is not reprimanded, individuals will tend to adopt and to imitate the behaviour [14]. Introduction and training of the 3R waste management system (Reuse, Recycle and Reduce) is a form of initial knowledge that is to reduce the volume of waste in riverbank households. This attempt is supported by settlement planning in the river bank by changing river into front yard. The people are expected to keep their front yard clean by utilizing waste bank as basic infrastructure in creating an environment-friendly behaviour. Knowledge and insight enable the people to have critical awareness of environment, and thereby commitment is built to change their behaviour [25]. Through experience with flood disaster and health disorder in community create reflective attitude to social practice in managing waste inappropriately [15]. It becomes a capital for the development of community's collective awareness to improve the condition of village and river through more appropriate waste management. This social transformation through capacity building is an instrument of empowering the community in managing domestic wastes.

Group empowerment is the next stage of social transformation process. This attempt aims to improve group capability and capacity in order to have access, control and independence in managing domestic waste. Group empowerment in the form of waste bank has economic and ecological tendencies all at once. Economic approach becomes main appeal to the citizens to be committed to managing waste because economic value can be yielded [9]. Not only the process of sorting wastes with economic value but also the process of processing organic waste into maggot is an important transformation process in waste management. In addition, collaboration with universities to develop technology in the form of incinerator machines is also carried out to convert plastic waste into fuel oil so that it can be used to meet the transportation needs of waste transporters. Economic empowerment is confirmed with political empowerment through the river bank community's social responsibility for the wastes yielded. This action is the form of collective commitment of river bank community when the knowledge on how to manage wastes appropriately has been a social practice to ensure the sustainability of its management [26]. Sustainable social practices in managing household waste not only bring economic benefits but also ecological benefits. Group empowerment established at micro scale can be expanded in larger scale through social network development.

Social transformation process can be expanded if it involves more open institutional development. It is supported by the process of developing relational community in the form of social network connecting upstream areas to downstream ones. Typical characteristics of interconnected river bank provide integrative condition of action. Therefore, social network becomes a vehicle or a hub to achieve the objective of ecological movement [29]. It is manifested into the Griya Rumpun's capability of establishing social network into Cross Winongo (*Lintas Winongo*). This network establishment is the result of citizens' aspiration assuming that the factors facilitating or inhibiting the practice of managing wastes sustainably are not only due to the availability of technical infrastructure but also social factor raising or lowering citizens' motivation to change practice into habit [20]. Network is also intended to expand the citizens' supporting commitment in both upstream and downstream areas. This network plays an important role as a social learning hub between households and confirms collective commitment in waste management [28]. That way, group empowerment becomes a social transformation in household waste management has an ecological impact, for example, the volume of waste continues to decrease, the health condition of residents improves, and riverbank villages that are free from the impression of slums and dirty. Meanwhile, the economic impact on waste management can be shown by the emergence of waste-based household industries and the emergence of maggot cultivation

in several regions.

Although capacity building, group empowerment and relational community development have been carried out, the social transformation process in waste management faces some constraints. The main constraint is, among others, is the change of key actor formation within community. In addition, the institutionalization of social network by city government results in the marginalization of a number of actors in strengthening the group empowerment [30]. It results in stagnation in the process of coordination and communication between river areas. Therefore, the change of network formation and the innovation of institution are carried out.

The organization of new community appears in the format of Winongo Asri Communication Forum (Indonesian: *Forum Komunikasi Winongo Asri* or FKWA) focusing not only on the management of domestic wastes but also on conservation issue and river rescue. This new institutional format gives the community an opportunity of reaching transformation process broadly through involving the privates to participate and to have social responsibility in the sustainability of Winongo [27]. In addition, higher education (universities) and other Non Government Organizations can also be involved to enable the supporting policies to ensure the sustainability of movement. This development of relational and multiparty community strengthens the social transformation process of river bank community in managing domestic wastes.

The last stage of transformation process is the development of new culture in managing domestic wastes by the people in Winongo river bank. The development of new culture can be conducted through the social practices in managing the wastes repeated by household. As Pierre Bourdieu mentions, habitus results from repeated social practices supported by adequate structure and culture [31]. Unfortunately, the process of developing new culture in managing domestic wastes occurs only in some community groups, women group. This is possible because the responsibility for managing domestic wastes tend to be imposed to women [20]. The implication is that the processes of capacity building and community empowerment are dominated by women's role. Meanwhile, the social network development process between areas is dominated by men's role because they serve as the regional leaders. Thus, the process of developing new culture in managing wastes should be expanded in its role and involvement [6]. Therefore, the scheme of river school is used to reach men group, youth, children to get education and to practice it in daily life. River School facilitates the process of developing environment-friendly values [27] This attempt becomes a way of accelerating the process of developing new culture in managing domestic wastes. Through the development of new culture by the people in river bank in managing domestic wastes, the City's sustainable development goals can be achieved.

4. Conclusion

The stages of social transformation process in domestic waste management do not run linearly, but tends to be dynamic and adaptive to the social-ecological context of Winongo River. The stage of community capacity building is the hardest starting point as it is related to the implantation of environment-friendly values coloured with ignorance and inconsideration. However, because the experience with flood disaster has resulted in new awareness of the importance of river maintenance, the stage of community empowerment can yield several female entrepreneurs from waste management. Similarly, the stage of relational community development is a for waste bank community to develop network and knowledge as well as broad knowledge so that innovation and creativity can be built in waste management. Finally, the stage of new culture development is possible if cultural resource can serve to maintain the community's commitment to manage domestic waste sustainably. Factors affecting the social transformation process originate from the change

of key actor formation within community. The institutional format reorientation process representing the stakeholders' interests can prevent stagnation and actor marginalization. The solution to the problem of women role domination in waste management is to expand the community group through river so that the social transformation process can run well. The social transformation process in waste management that has been carried out can contribute to climate change mitigation efforts. However, a follow-up research agenda on the integration of innovative technologies or renewable energy solutions into community waste management systems is needed to support the transformation process of riverbank residents in realizing sustainable urban development.

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