The Role of River Embankment Workers in River Conservation in Surakarta City

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Abstract. Rivers in Surakarta City experience silting problems, pollution from both industrial and domestic waste, and flooding in rainy seasons. The government through the BBWS BS (the house of parliament of Bengawan Solo River) has carried out a series of river revitalization activities as an effort to handle the flooding in Surakarta City. These activities include normalizing rivers, widening rivers, relocating settlements from river borders, building dikes, building sluice gates, building pump houses and all facilities in the riverbank area. This government effort will be useless if the community does not participate in protecting what the government has built. Public is still lack of awareness on the importance of maintaining the river sustainability. There are still many people who throw garbage into the river and use the river embankment not as it should be. To overcome this, BBWS BS has formed a river embankment worker, which is a special officer to treat, clean and maintain the physical shape of the Bengawan Solo river. This study aims to determine the role of the river embankment workers in conserving rivers in Surakarta City. The method used is TPB (Theory of Planned Behavior). Based on the results of the study it is known that the River Embankment Workers have a positive attitude in river preservation. River embankment workers also educate the public to participate in maintaining the preservation of the river. The difficulty faced by the River Embankment Workers is that people are still desperate to use the river embankment and throw garbage into the river.

1. INTRODUCTION
Natural resources are the basic capital for the development of a country[1], one of which is river. Rivers generally have very important values for life because they contain water which is an energy source.[2] According to Government Regulation No. 38 of 2011 concerning Rivers, rivers can be used for households, agriculture, environmental sanitation, industry, tourism, sports, defense, fishery, power plant, and transportation but on a note that is done by not damaging the ecosystem.

Multi-dimension role of rivers in people's lives can be illustrated in Figure 1. Starting from the use of water for agriculture and industry, household needs, transportation, food, recreation, mineral extraction, and habitat for animals and plants.
The use of the river for various needs for the community is quite clear, but sometimes human activities have a negative impact on the river. The most obvious is water pollution caused by household waste, trade and industry, solid waste, chemicals, and other wastes that affect water quality and affect its use for drinking and as animal habitat.[3] Rivers in Surakarta city experience various problems along with the increasing human activities, the rapid development of the industry and the increasing number of people. Solo, known as Kutho Budoyo, has a batik industry production center in Laweyan and Kauman. Industrial waste also pollutes the cleanliness of the river. Besides, the slum development in the river area worsens the condition of the river. People throw household waste into the river because they do not fully aware the importance of preserving the river. Aside from being polluted, river also experiences siltation which cause flood in rainy season.

In the implementation of river conservation efforts, it is necessary and important to involve the community so that river conservation efforts are sustainable. As research conducted by Jingling[4] on the Haihe River Basin in China, the role of the community is the key to the success of effective and efficient river management. Through the River Embankment Workers, the community is involved in river conservation efforts in Surakarta City.

Roles or participation are difficult to evaluate because there are no generally accepted quantitative indicators. It is thus important to distinguish between different levels of participation.[5] Whereas according to Choo-Ina [6] community participation is defined as a process that allows people to be involved in planning and implementing development with collaborative thinking and decision making about their problems. This involves the use of creativity, knowledge and skills, along with the right guiding and monitoring, and simplicity of the relevant staff, resulting in an increase of living levels and rehabilitating community problems. This concept is achieved by participatory procedures including public information, public consultation, public meetings and decision making.

Knowledge and role of local communities play an important role in water management. For a long period, people can manage their own water resources. This kind of thing can still be found in upstream areas, but for various reasons it disappears along with local knowledge. A typical example of community-based management can be found in the Toro village community, Lore Lindu National Park, which has been practicing integrated and inclusive integrated land and water management for many years [7]. William [8] explores four case studies where community participation has led to success and failure in managing lakes in Australia. Various studies have stated that the success of the preservation of a resource is very dependent on the participation of the community. Thus, this study was aimed to know the role of the community in preserving rivers in Surakarta city which starts from river embankment workers.

2. METHOD
This research is a qualitative research using the Theory of Planned Behavior (TPB) approach. Theory of Planned Behavior (TPB) is the development of the Theory of Reasoned Action (TRA) [9]. Jogiyanto [10] develop this theory by adding constructs that do not yet exist in TRA. This construct is called perceived behavioral control. This construct is added to TPB to control individual behavior which is
limited by its shortcomings and the limitations of the lack of resources used to conduct its behavior [11]. By adding this construct, Perceived behavioral control, the form of the theory of planned behavior could be seen in the following figure.

Figure 2. Theory of Planned Behavior

There are 3 variables in Theory of Planned Behavior, they are:

a. Attitude
   Lo Choi Tung [12] says that attitude toward the behavior is the degree to which a person has a favorable or unfavorable evaluation of a behavior. It depends on the person’s assessment of the expected outcomes of the behavior. Based on Assael [13], attitude is a tendency learned to respond to objects or classes of objects consistently both in liking and disliking. In this case, the attitude of the community in maintaining and preserving the river.

b. Subjective Norm
   Lo Choi Tung [12] said that “subjective norms is social pressures perceived by individuals to perform or not to perform the behavior. It relates to beliefs that people encourage to carry out behaviors”. In this study, it is the public perception toward other people perception who support or do not support their work.

c. Behavioral Control
   According to Tony Wijaya [14] behavioral control is a perception toward the strength of the factors that make it easy or difficult. In this study the perception of river embankment workers on the factors that facilitate and make it difficult for them to carry out their duties in maintaining river sustainability.

The research data was taken through surveys and interviews, then analyzed using the Theory of Planned Behavior approach.

3. RESULT AND DISCUSSION

This research was conducted in Surakarta City, Central Java Province. The city with an area of 44 km² is bordered by Karanganyar Regency and Boyolali Regency in the north, Karanganyar Regency and Sukoharjo Regency in the east and west, and Sukoharjo Regency in the south. The city is also the third populated city on the southern island of Java after Bandung and Malang. The east side of the city is passed by Bengawan Solo river. Bengawan Solo River is located between 110°18’ and 112°45’ EL and between 6°49’ and 8°08’ SL. The river drainage area is ± 16,100 km², located in Central Java and East Java provinces. Bengawan Solo River is the largest river on Java Island, flowing from the Sewu mountains in the south of Surakarta, to the Java Sea in the north of Surabaya through a path of ± 600 km covering an area of 12% of the entire island of Java.

Bengawan Solo River area is divided into two main areas, namely the Upperstream Bengawan Solo River Region and the Lowerstream Bengawan Solo River Region, at a meeting with Kali Madiun. The upper region is divided into two sub-regions: Upper SWS Solo and Kali Madiun, with an area of 6,072 km² and 3,755 km² bordered by Mount Lawu. Upper BengawanSolo and Kali Madiun drain water from cone-shaped mountain slopes, namely Mount Merapi (2,914 m), Mount Merbabu (3,142 m) and Mount Lawu (3,265 m). The tributaries carry a lot of sediment material from erosion on the slopes, resulting in high sedimentation in Bengawan Solo.
The river embankment worker was formed by BBWS BS (the House of Parliament of the Bengawan Solo River) since 18 February 2018. The workers were formed with the main task of caring for, cleaning and maintaining the physical form of the tributary river, solo river and river bodies, among others; 1) Cleaning embankments from perennials; 2) Cleaning the river from disturbing garbage; 3) Smoothing river flow; 4) Holding patrol / monitoring of Water Level during rain; 5) Educating people around the river not to throw garbage into the river.

The river embankment workers consist of 14 people with a task force of 2 people as river observers, 2 people as river interpreters and 10 people as river workers. The main task of the river workers is to maintain the entire river in the city of Surakarta from upstream to downstream which is passed by the Bengawan Solo tributary. Based on the results of interviews, workers work for 25 working days in one month which was done during 15.00 to 18.00 depending on the team agreement. Daily activities are recorded by river interpreters and reported by river observers to BBWS every day. Whereas monthly activity reports and financial and administrative reports are carried out by river interpreters once a month.

Based on Theory of Planned Behavior, it could be elaborated several community variables in maintaining environmental sustainability as follows:

a. Attitude
   The attitude and awareness of the community in maintaining the sustainability of the river is still lacking, this can be seen from the fact that there are still people who throw garbage into the river. Through river embankment workers, community awareness was formed in maintaining river sustainability. The community was given socialization through RT meetings, and was also involved in the activity of river embankment workers, which was a mutual cleaning of rivers.

b. Subjective Norms
   Subjective norms are community perceptions towards others perceptions in river embankment conservation activities. According to some people, most of them have supported the workers in conserving rivers in Solo city. Those who support river conservation efforts also hope that people who are not aware of the importance of maintaining and conserving rivers can follow their footsteps.
to support government efforts in river conservation. The community acts persuasively to those who are not aware of the river sustainability by inviting them to join in community service to clean the river.

c. Behavioral Control
In making people to aware of the importance of preserving rivers and inviting them to take part in river conservation efforts, workers are not always immediately accepted by the community. It requires time and process so that people will understand. The difficulty faced by embankment workers and the community is the conflict of interest of the community. The society is still processing riverbanks for secondary crops, and has not all been able to escape from the wasteful tradition of throwing away objects or belongings of those who have died, or traces of accidents to the river. While the supportive thing is the existence of prokasih, the appeal of the village government to help preserving the river, the existence of river cleanup competitions and the use of the river as an ecotourism object by the government.

Based on the Theory of Planned Behavior (TPB) analysis, it can be seen that the presence of river embankment workers is a good start to involve the community in maintaining river sustainability. More and more people were moved to join the efforts, begin to abandon the old habit of throwing garbage into the river and help making the river an object of ecotourism in the future as the Surakarta city government program “Realizing Surakarta City that is Cultured, Independent, Advanced and Prosperous”. A river that is sustainable, well maintained, clean and has been beautified with gardens along the right and left banks of the river can be an attraction for ecotourism that can grow the economy of the community.

In line with the research conducted by Jingling [4] in the Haihe River Basin of China, the role of the community is the key to the success of effective and efficient river management. Thus, through the involvement of the community in river preservation through the river embankment workers, river preservation in Surakarta is expected to be effective and efficient. It is in accordance with the results of research from Choo-in, et al. [6] which examined the role of communities in maintaining surface water quality. Choo-in, et al. took water samples at several points in Amphawa District, Samut Songkhram, Thailand and then linked with the community participation in maintaining water quality. The results can be seen that areas with low water quality have low participation as well. Furthermore, Shrestha [15] examined that community participation in the preservation of wetlands in Nepal states that one's participation is the most important in building community participation. Community participation plays an important role in developing capacity for sustainable resource management and utilization.

Thus it is clear that the community involvement is very important in maintaining river sustainability in Surakarta City.

4. CONCLUSION
a. River Embankment Workers have positive role in river sustainability in Surakarta City.
b. River Embankment Workers educate the community to join the river preservation effort thus the community
c. will be more aware on the importance of maintaining river sustainability.
d. River preservation could be successful if there is a collaboration between government, organizational groups, and communities in river conservation efforts.

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