

# **Capacity Improvement towards Participatory Water Management in Peri-Urban of Giripurwo, Gunungkidul Yogyakarta**

A.N Khasanah, N.L Hanum, D.R Hizbaron  
Faculty of Geography, Universitas Gadjah Mada  
Email: alfiatunnur@gmail.com

Participatory water management in community aims to anticipate the global warming effect in the area where lacking of water resources such as in Giripurwo. Participatory water management is an alternative solution towards limited water service in peri-urban areas. In the case of Giripurwo hamlet, there are three clean water sources, namely, Pego, Bekah and Tangis which have not yet effectively managed nor efficiently used. These sub-surface river have provided clean water using gravitational system to distribute clean water equally to each water reservoir in different administrative units. During rainy season local community relies upon rainwater reservoir or shallow dug well pump. However, it is common for them to buy clean water supply provided by regular tanks with proximately 5.000 IDR per liter during rainy or dry season. This research aims to observe effective capacity improvement to create better participatory water management in Giripurwo area. The research methods collects data using forum group discussion and describe research finding using qualitative manner. The preliminary result indicates that 1) participatory water management is somewhat lacking; 2) it requires further improvement which relates to increase local knowledge; 3) the promoted program to improve local capacity should engage with other stakeholder, such as academics, private sectors, non government organization and or local government. The local community have identified some possible activities such as, early education to clean water management, dissemination of water filtration management. In the micro scale, household level yet provide pivotal role in strengthening local capacity, however in macro scale, communal level have set target group to maintain clean water service. Initially, their institutional base to create better participatory water management has just started, however their ability to improve is promising, especially due to strong involvement from diverse stakeholders.

**Keyword: capacity, participatory, water, management, Gunungkidul**

## **Introduction**

Natural resources and environment are main capital to support achievement of national development goals. The effort mastery over water as well as the wealth contained in it is also regulated The Constitution of the Republic of Indonesia of 1945 Article 33 which the water resources are utilized for the welfare of the people of magnitude. Explicitly, The Act Number 7 of 2004 Article 1 states that water is a social and economic goods so its utilization should follow the principles of efficiency and fairness. The implementation of it is required public participation from local up to national scale. Post launch of the Act Number 22 of 1998 and Number 25 of 1999 on Regional Autonomy are enacted, the difference between the regional interests are getting clear and the other hand, the pressure of the water supply is getting increase.

The Pressure on fulfilment of the water needs should be supported with adequate water availability. The one that affect the availability of water to comply the basic human needs is global warming. Macro impact of global warming is climate change. One of the Indicators of climate change is raising the temperature of the surface. That indicates as a potential danger of climate change with an increase in evapotranspiration which can cause drought. Waggoner in Muchtar (2012) states that the increasing of temperature will be followed by the increasing of evapotranspiration and effects on run off (surface flow) so the hydrological balance will be disrupted. When evapotranspiration in an area increases as response to the increasing in atmospheric temperature, while precipitation remains or even less thus the region will be lack of water supply, even drought.

Many efforts that made in the management of natural resources and the environment however there are many problems that can not be addressed thoroughly. There are some of the main problems, among others, is lacking of understanding of the importance of the management of natural resources and environment sustainably and lacking of public participation in water resources management. In some areas, water resources are limited because of climate and physical conditions that do not support in the region, including the area of research in Giripurwo. Southern part of Gunungkidul is formed from a rocky limestone. Rainwater does not flow into the surface but most of it goes into the underground flow system through the cracks and rock cavities, which known as “luweng”. This condition causes the southern of Gunungkidul always lacking of water and prone to drought. This situation has been going more than a decade thus the local communities have built their own adaptability to cope with limited resources. The lack of response to the water problems increases the potential of vulnerability in the region. Beside the

micro impact of environment problem on the household can affect the development of macro level in rural unit. Further, the sustainable planning that related to water resource management is needed by considering several factors of rural regional development strategy.

Rural development is the improvement process of the quality of life of rural communities by harnessing science and technology to create national development purposes. The definition of rural area is region which has the main activity is agricultural, including the management of natural resources in that area as a place of settlement, the ministry of government services, social services, and economic activities. Rural development is developed by considering of community empowerment aspects which emphasizes on providing facilities, encouragement or assistance to communities in rural areas for sustainable use of natural resources. Participatory planning in this case can be used as one way in water resources management and capacity improvement of community as a form of learning and sustainable development. Community capacity improvement in this study aims to increase adaptation to the impacts of climate change , which is coordinated in an integrated manner with all stakeholders involved from the government , community organizations , public , private. Capacity improvement in the context of climate change is the process of developing the skills, human resources and institutions to enable them to participate in all aspects of adaptation , mitigation , and research related to climate change ( RAN - API , 2014 ) . This strategy will involve the utilization of knowledge , perspectives , and skills of local people in the management of water resources. This research bases on the concept of social capacity improvement as a condition for sustainable water resource management.

The concept is outlined in Chapter 18 of Agenda 21 of Sustainable Development Framework of the UN , states that strengthening social capacity is a long-term process that focuses on ( Fulazzaky & Akil , 2009) :

- Providing a policy and legal framework
- Institutional strengthening and development , as well as local participation
- Human resource development , including the development of appropriate leadership system of interest utilization of water resources
- Education management and awareness improvement of the availability of water resources at all levels of society

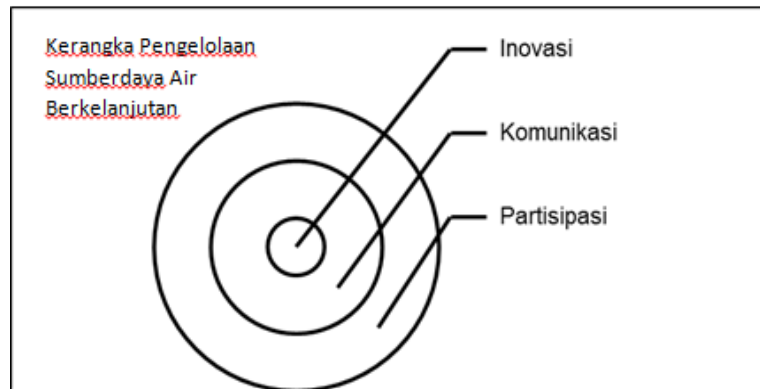


Figure 1. Research Concept

Figure 1. illustrates that the sustainable management framework of water resources requires at least includes three major factors , namely technological innovation ( engineering , information , databases , etc. ) , communication systems ( web-based or community -based ) and participation ( participation at various levels , involving the role of community , government and private sector in various regions ). Communication Innovation and participation that are formed at the community have a very high diversity , therefore it takes an approach that is able to explain the forms that have been already had in social unit which can be used as learning cases for other social units .

The research approach that is used is based on a participatory approach , promoting the importance of participatory planning using participatory rural appraisal ( PRA ) or participatory learning action ( PLA ) . According to the Chamber (1996 ) , PRA is a set of approaches and methods that encourage people to participate and to analyze their knowledge of life and their conditions thus they can make plans and actions. The PRA approach can drive public awareness improvement, responsibility , and behavior changes towards community-based water management. It can be an indicator the improvement of ability of adaptation, mitigation of environmental damage and drought. Given these research activities is the implementation of the Education for Sustainable Development ( ESD ) , it was important to identify the capital which has invested in the community and challenges to achieve its sustainability. Participatory mapping efforts is undertaken with the aims: 1 ) identify the knowledge society ; 2 ) explore the interest of community involvement ; 3 ) increase the awareness of all members of the community about their rights to land and natural resources.

Mapping in this activity is referred to inventorying and collecting the relevant information of the capital of life in society as the first step in setting the strategy for the capacity

improvement of communities to manage water resources. Maps can be used as a negotiations tool with other parties because using a map can interpret clearly how the area used by the public and who is entitled to that region. The process will build the spirit to explore local knowledge , historical origins , local institutional systems , local legal institutions , identification of natural resources. The challenge in the future is bring up local institutions, both the institutions that have existed and new form becomes community mobilization as a form of interaction with the government and other sectors in repairing and keeping the sustainable management of water resources .

## **Methodology**

Stages of implementation of activities are described as follows:

### **Phase 1 preparation.**

Preparation phase includes observation and collection materials are required. Observations are conducted with Rapid Rural Appraisal (RRA) method. Introduction of region is conducted to get a general overview of the region rapidly. The observations for that are also conducted to determine the commitment and willingness of the community in the activity of community capacity improvement. And also conducted with literature study, secondary data collection, questionnaire collection and workshop materials concept. The literature study includes study form books, scientific journals and previous research. Workshop materials concept are used to guide the development of early institutional citizens in discussion groups.

### **Phase 2 Data collection and field observation. The data collected is interview data with community using questionnaire guide as early information.**

This research activity approaches Participatory Rural Appraisal (PRA). This approach is defined as a group of methods that encourage rural communities to participate and enhance their knowledge about life and circumstances so that they can arrange plan and implementation action independently. This approach can strengthen communities by mobilizing and encouraging to explore of their potential and dare to act improve their quality of life with continuous learning is accompanied by a companion or mediator. The methods are used in the implementation is the socialization and counseling and then the formation of Focus Group Discussion (FGD) and Participatory Mapping.

Focus Group Discussion (FGD) or focus groups are interviews of several individuals with the same relative social status which is focus on interaction within the group based on the statements by the companion who acts as a facilitator in the group discussion. The results of the method FGD interviews are manuscript and group discussion. Participatory Mapping method has long been used to support the activities and operations of space, to define the region, and to set limits. Map is a media that contains a number of data showing the pattern and spatial structure. Society can gradually supplied the ability to sort, read, and analyze the map for planning requirements and field activities.

### **Phase 3 analysis .**

Data analysis is an attempt to summarize the findings in the field of information units and then induced into the formulation of concepts related to the objectives of the activity. Based on the mapping exercise carried out, then elaborated in training activities and workshops as an alternative of community capacity improvement.

### **Phase 4 statements .**

In this phase, report drafting and preparation of maps as the final product of research. At this phase of the report drafting is also carried out consultations with relevant stakeholders such as the Purwosari Sub-district and local communities. The consultation process can be performed using workshop media, seminars and or discussion. Based on inputs from the stakeholder will be a final report.

### **Phase 5 dissemination**

At this phase, the dissemination of the results of activities in paper format for national and international journals, posters, leaflets and course material.

### **Phase 6 Analysis and Reporting**

The analysis is conducted by the method of triangulation . The process is carried out since the field data obtained by writing remarks, transcription recording interviews, photo documentation with aim to simplify the data in the form of a deeper and easier be understood. And then to conduct depth interviews with key figures.

Here are the details of the purpose and methods outlined in the following table :

Table 1. Objectives and Implementation Method of ESD

No	Objectives	Method
1	Mapping capacity of village communities in the Giripurwo Purwosari Sub-district, Gunungkidul . Community capacity mapping aims to identify the capabilities that already exist in the community in utilizing water resources. Ability assessed based livelihood capital variables that exist in the region. The strategy which is used is the Participatory Mapping and depth interviews.	Participatory mapping, field surveys, Focus Group Discussion
2	Alternative the capacity community improvement planning. The alternative is realized in the form of activities such as education, training, creation of modules, as well as other activities that can improve the capacity community is considered.	Workshop, outbound, training, socialization, brain storming

## Results and Discussion

Capacity improvement in this study focus on education and training assistance activities in order to increase capacity or community empowerment towards sustainable water management. Through the empowerment process, there is some sequence of attempts to establish an empowered community: awareness, understanding ,utilization ,and habituation are the phases on the empowerment process. Through several activities which are conducted in this research are expected to cover all the phases in the empowerment. Empowerment that is conducted is covering several aspects, namely economic, social , and environment, especially related to water management in the village Giripurwo, Gunungkidul. Community empowerment in water resources management has done through community training that aims to provide motivation that encourages participants to have a paradigm or a positive outlook and attitude to support the efforts of capacity improvement in water resources management.

Various training activities can be referred as the core activities in order to develop community capacity . These activities are FGD to accommodate the aspirations of the people as a form of communication improvement between people in response to problems, youth training in

the management and care of equipment and piping of water pumps, counseling of water filtration tools that can be applied by residents to improve water quality, and public awareness improvement related to early water management education of water resources (the target is children at school age). Capacity improvement of the community can be seen through the similarities between the role of community members, the communication between people, the confidence of each individual, the open access to outside information, and coordination among residents that is getting increased.

Table 3 Capacity Improvement Activities

No	Level	Programs
1	Micro (Individuals and Communities)	<ol style="list-style-type: none"> <li>1. Focus Group Discussion</li> <li>2. Youth training related to water management</li> <li>3. Counseling of water filtration</li> <li>4. Improving children knowledge regarding the condition of the environment, water resources, benefits of water, and water management</li> </ol>

Source : Results of analysis, 2014

There are three levels of empowerment, the micro level (individual and community), meso level (institutional and organizational) and macro level (policy and systems). In this study, the level which is used is the micro level. Empowerment starts from the formation of the understanding of water management on individual, societies and communities. Institutional or organizational on water management in Giripurwo have not managed well. Thus the training activities and FGD which have done can lead to the formation of institutional and organizational. While the approach that is made in this study, among other social approaches, and gender. The first activity which was undertaken was Focus Group Discussion with the targets are local government's staff and many rural communities such as rural communities "desa prima", PKK.

Community empowerment activities in Giripurwo has been doing since 2012, especially by involving KKN PPM UGM students. Here is a description of all activities that have been implemented and results of activities that have been achieved :



## **1. Focus Group Discussion Program and Socialization**

**Activity 1 :** FGD for identifying the potential management that already exist in the community, identification of problems and potential management with the expectations of society in the future to increase the capacity of participatory planning in the research area.

Community aspirations:

1. Management of water resources is focused a source of water that has used by residents , thus the existed springs must be preserved
2. The societies also expect to receive training on the management and utilization of water distribution equipment , especially the local youth. It is considered the youth as the successor to the sustainability of water management in Giripurwo .
3. The society expects seedling preparation training in agriculture
4. One of the aspects of community capacity improvement is the economic aspect. The society also expects some training that aims to increase revenues. The training is expected to cover people who have the willingness and appropriate ability.

## **Activity 2 : Socialization water quality and water filtration**

Water quality assessment has been carried out in 2012. Based on residents request, water quality testing was conducted in 5 points. The results of this quality assessment showed that the water from PAH and water well of Gubar fit for consumption. The water near Gubar cemetery contains high organic substances in other hand that water has a high content of nitrate that would be smelt when it left more than 24 hours .While water from well in Temon sub-district contains high CaCO<sub>3</sub>. That two troubled samples have to be done a special treatment in order to be used properly. In addition, the water quality testing was also conducted on the spring of Bekah and Tangis. The result test of spring Bekah showed poor water quality for consumption .

The next activity was the manufacture of a simple water filtration equipment using some materials such as activated charcoal , gravel , sand zeolite , and the aquarium filter. In addition, surveying of existing filtration equipment also conducte

## **Activity 3: The society expects seedling preparation training in agriculture**

The counseling of drought disaster mitigation was carried out in collaboration with BPBD. That socialization aims to establish better relations between communities with

stakeholders or other agencies that can increase the cooperation with the local government. So the more the existing network which they have, the more strengthen the capacity of the community. Beside the drought mitigation counseling, the importance of clean water for daily life , such as for drinking and cooking were also explained in the meeting.

Considering the existing conditions, some rural communities have no water reservoirs which satisfy the standards because there is no filtration system or an adequate screening to filter nutrients - substances that are mixed with contaminated rainwater thus the water is required the quality water testing that is consumed by people community.

#### **Activity 4 : Institutional assistance of water management**

Self-management organization of water management have established in 2012. The purposes of this organization are controlling the exploration proposal of springs Bekah and treating and managing water resources system that was lifted like springs Pego at Dusun Tlogowarak. Water management organization that has already existed are the water management organization in RT 10 Padukuhan Sumur and " Toya Kendi Pego " Pego water management . This organization was controlled and accompanied by PAMMASKARTA and the local government. In the process, expected to be formed as BUMDes which will be ran by the local government to regulate the distribution and management of water points. Main focus of activity in this year is administration assisting and management of water resources management.

The counseling discussed with all administrators both Pego and Sumur about problems that they faced in the management of water resources. From the discussions could be found several problems that resisted the progress or the distribution of water to the local people . The problem was the differences of opinion between administrator and local people and administrative problems that have not been completed yet. Discussion and socialization of the water management was held and attended by administrators of water management community and local people. On that meeting the administrator explained how to subscribe , rate , and what kind of facilities which is gotten by society are. This meeting carried out to bring together both communities and the administrators to get best solutions and built the good relations between them. Assisting was also conducted which related on administrative issues such as completion of the registration requirements of water institutions to PAMMASKARTA. The purpose of this

registration is listed in the Department of Public Works as a member of PAMMASKARTA which can get some help such as infrastructure needs (pumps, tanks, pipes, etc.).

## **2. Early Education of Water Resources For Children**

Activities conducted in the form of making cartoon leaflets and outbound. Handing out leaflets is intended to provide information to teenagers and children to have a discourse sustainable management of water resources. It included the availability of information on water resources, the benefits of water, and packed with interesting form. It also intended to attract enthusiastic children in reading. Leaflets and posters will be shared with schools and child study groups in some orchards. Introduction of water function and water management on school children also performed using outbound programs. The aims of this program is to increase the understanding of children about their living conditions, the benefits of water, and its management in the form of interesting activities. Children consisting of primary school age up to high school follows the outbound activities

## **Conclusions**

- 1) Participatory water management is somewhat lacking ;
- 2) It requires further improvement roomates relates to increase of local knowledge ;
- 3) The Promoted program to improve local capacity should engage with other stakeholders , such as academics , private sectors , non- government organization and or local government .

## **Acknowledgment**

This study was partially supported by SBRC - GMU and the authors would like to express sincere thanks to all the following agencies for community empowerment acieveing this study: Local Government of Giripurwo; KKN - PPM UGM 2014 Giripurwo; PAMSWAKARTA; BPBD Gunungkidul

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