

ACCESS TO WATER AND COMMUNITY NETWORK PARTICIPATORY APPROACH TO COMMUNITY MANAGED WATER SUPPLY SYSTEM

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1. Introduction

Lack of access to clean water supply is today's world problem. Regarding to NARBO report (2007), around 600 million people in the Asia – Pacific region live in the area with no connection to water services. In case of Indonesia, among total population 231.6 million inhabitants (2007), there is only around 49.7% of the citizen has access to water. Indonesia local water company (named as PDAM) supplies around 39.7% of the citizen. The rest 10% of the citizen are starting to engage in a participatory approach to community managed water supply system (named as HIPPAM) in order to access to water based on community network (Statistic Centre Board, 2005).

Why people are involved in establishing the community managed water supply system in order to access water?, Whether their choices to join the community managed water supply system are cooperated or not?, Why people do or do not engage in a kind of collective action?, It is important to investigate the mechanism of the spontaneous collaboration to access water.

This study aims to investigate the mechanism of the spontaneous collaboration to access water of community managed water supply system based on a panel survey of Indonesia's water supply system. In detail, section 2 describes the basic idea. In section 3, the outline of the panel survey in this study is explained. Finally, in section 4, a case study is applied and significance and problems of the result are discussed.

2. Basic Idea

Most people who live near the water resource which is a subject of squeezing are not always economically-advantaged. Not only that, it might be seems that people living near “economically-attractive water resource” are poorer according to the standard of living in their country. There is a mechanism that inhabitants can not develop the water resource with their value. How we ensure the sustainability of both ecosystem of parent biological and physical cycle in nature and water resources which people take out for their life? How we share the cost and benefit upon the processes to produce and sustain goods and service, which are provided by the resource?

Under the situation of lack of access to water, collaboration activities for water supply system by community members who live in near the water resource has examined in many countries. Collective action may be defined as action on the part of one or more people striving to achieve objective or satisfy common interest of the group, implies devising frameworks that limit the pursuit of individual self interest and sustain the benefit shared by the group¹⁾. M. Olson in a theorem of “The Logic of Collective Action” mentions that a group cannot base its reasoning on the rational choices of its individuals, unless the number of individuals in a group is quite small, or unless there is coercion or some other special device to make individuals act in their common interest²⁾.

In order to support and sustain the participatory approach to community managed water supply system, it is necessary to clarify the mechanism and to invent institutional system for support the collaboration activities. However, there are not enough investigations on the participatory approach to community managed water supply system.

This study examines to conduct empirical research on fundamental activities to comprehend participatory approach of the local inhabitants who contribute into community managed water supply system. In detail, Indonesia's participatory approach to community managed water supply system in Malang regency is chosen as a case study area and investigates its collaboration system based on panel survey.

3. Panel Survey

The panel survey was conducted in 2008. Through systematic sampling, 500 households living at Toyomarto village and Candi Renggo village, Singosari district are selected for the study. Data is collected employing the questionnaire interview survey method. The respondents are the husband, the wife or the head of family. The questionnaire interview survey is divided into 3 sections: (i) 9 questions to describe general information of the respondents, (ii) 9 questions to gauge current water supply system, (iii) 8 questions to assess community networks.

The constraint of the study is that the respondents are selected from two villages among 17 villages in the district. Hence the results and the consequential assessments replicate the essential characteristics of the contacted people. In order to optimize representativeness of the population, the respondents selected for the study are chosen so as the represent typical precious population.

*Keywords: panel survey, water resource planning, participatory approach

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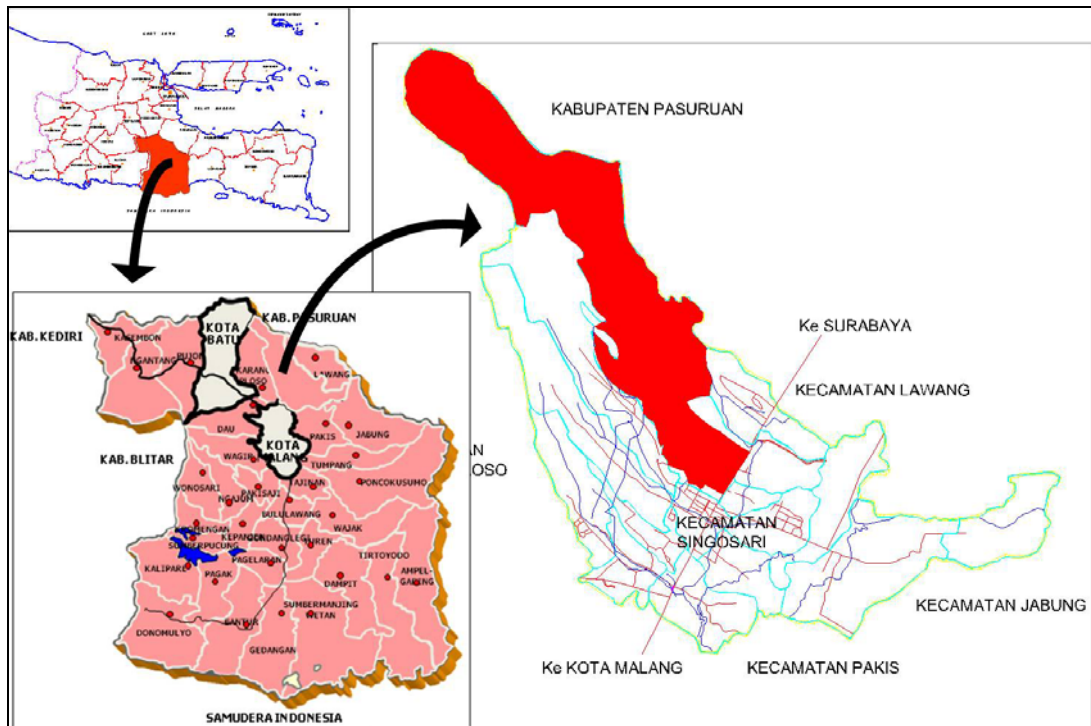


Figure 1. Map of Study Area related to East Java Province and Malang Regency

4. Results and Discussions

(1) General Information of the Respondents

There are majority male respondents (93%) as compared to the females in the study. The average age of the respondents is 47 years that more than 90% respondents can be classified into productive age (15-65 years). Majority of the respondents marries (89%) and the others are either divorced males or females. They has an average of 4 members in the household consist of parents and two children and around 44% of them has either one to three relatives staying with them.

Occupation of the respondents is dominated by manufacturing sector (63%). Type of their livelihood is such as food peddler, owner and worker in the small scale sandal industry, and farmer. Majority location of work place of the respondents is inside of Malang regency (85%). The whole of them are 21% respondents working at home and 18% work place is located nearby their house within the community inside the village. Most of the respondents reach their work place by walking or motor bike within less than 15 minutes.

Majority household income of the respondents is less than IDR 1 million per month (64%). This indicates that the residents are in the lower middle class of socio-economic status that the monthly minimum wage of Malang Regency in 2009 is determined at IDR. 945.500. And then education background of the respondents is 56% under or same level of middle school.

(2) Current Situation of Access to Water

Basically, there are 2 water resources are utilized by the respondents consist of surface water (spring and river) and shallow ground water (individual well). Regarding to Law no. 7/2004 on Water Resources, water service provider that available in the study area is (i) local company (PDAM) and (ii) community organization (HIPPAM).

Since 1984 PDAM with water capacity 10 liter per second had utilized Candi Sumberawan Spring to supply 110 households of the respondents. The respondents who join PDAM's facility are the respondents who officially registered as PDAM's member and pay monthly charge of water usage. Price for the first installation is around IDR. 1,500,000 (¥ 15,000), and then for the first 10m³ of monthly water usage is IDR. 11,500 (¥ 115) - a fixed price. Meanwhile, for the above water usage, price per cubic meter for domestic purpose is IDR. 1,500 (¥ 15).

Since 1999 HIPPAM with capacity 3 liter per second had utilized Candi Sumberawan Spring and Kenedes Pond to supply 217 households of the respondents through direct home water connection. The respondents who gains water facility from HIPPAM should be a member of a certain group of HIPPAM. One group of HIPPAM has member at around 50 to 150 households and under the member agreement they set a fixed price for monthly charge of water usage at around IDR. 2,000 (¥ 20) up to IDR. 15,000 (¥ 150). There is no limitation of water usage although some of HIPPAM's group has already used water metered in order to measure water usage of the respondents per month. And then for the first installation, the respondents need to pay at around IDR. 500,000 (¥ 5,000) up to IDR. 1 Million (¥ 10,000).

As depicted in Figure 1, Toyomarto village with total area of 1.55,64 Ha lies from 600 to 1500 meter above sea level that Candi Sumberawan Spring locates in 600 meter above sea level. Candi Renggo village with total area of 340,18 Ha lies from 400 to 550 meter above sea level and has Kendedes Pond at 450 meter above sea level.

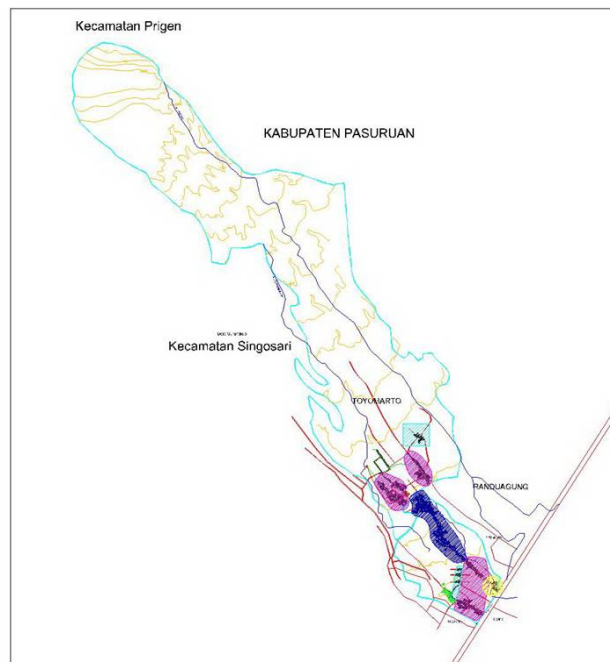


Figure 2. Map of Current Situation of Access to Water

As illustrated in Figure 3, HIPPAM also builds Communal Hydrant as pure public goods that could be utilized by every people freely. There are 57 respondents who use this non-excludability and non-rivalry public goods. Meanwhile, there are 110 respondents who supply their need of water through individual well as pure private goods for the owner.



Figure 3. (Left to Right) Individual Well, Communal Hydrant, Water Storage of HIPPAM and PDAM

(3) Collective Action of the HIPPAM's Respondents

Before going further to discuss about collective action of the member of community managed water supply system, it valuable to understand the background of the respondents itself. Among 217 the respondents of HIPPAM, there are 95% male respondents and majority age between 15 to 65 years (93%). Occupation of 151 (70%) respondents are related to manufacturing sector, that 180 (85%) of the respondents works inside Malang regency. And then 115 (53%) of the respondents have education in the level upper middle school and 133 (67%) of the respondents are having less than IDR. 1 million income per month. It indicates that the respondents of HIPPAM are characterized by member of the community with high potential towards their existence in the community related to their human resources (age, work place and education), but they have limit human capital related their low income.

Management of HIPPAM consists of 1 leader, 1 treasurer and 2 technician staffs that these committee members are selected among the whole member once in a year. Main task of the leader is to maintain management system of HIPPAM running well. The member goes to treasurer to pay their monthly charge of water usage that the price is set up under the agreement of the whole member on their community meeting. Special task of the technicians are to monitor and maintain water facility, and then try to fix the physical problem if it occurs. The whole money that compiles in the treasurer functions as capital source to keeping good the performance of water facility, and also to pay a service fee to the committee member that basically their jobs are a voluntary job.

During establishment of the group, there is financial support from local government under the coordination of Directorate of Public Works that the money uses to develop main physical construction of the water supply network related to building water storage and water transmission system. Meanwhile, water distribution per household should be

cover by each member. And then, in order to sustain water supply system, the management should maintain its own human capital to secure the system. Therefore, they set up an agreement that each member should pay once in a month in a certain day, and there is a punishment of cutting the water supply connection for the member who did not pay at utmost three months respectively after they got warning from the leader. But, once the member come to pay the late charge, the technicians will repair the water connection.

It shows that HIPPAM as water managed supply system can be categorized as club goods consist of combination of non-rivalry and excludable. Non-rivalry here means that water consumption by one member permit water consumption by another. Excludability means only the member have access to water from HIPPAM and exclude others from consuming it.³⁾In addition, participating member in the maintenance and management of club goods can be expected to have a stronger incentive to fulfill through understanding better role and collective benefits among members.

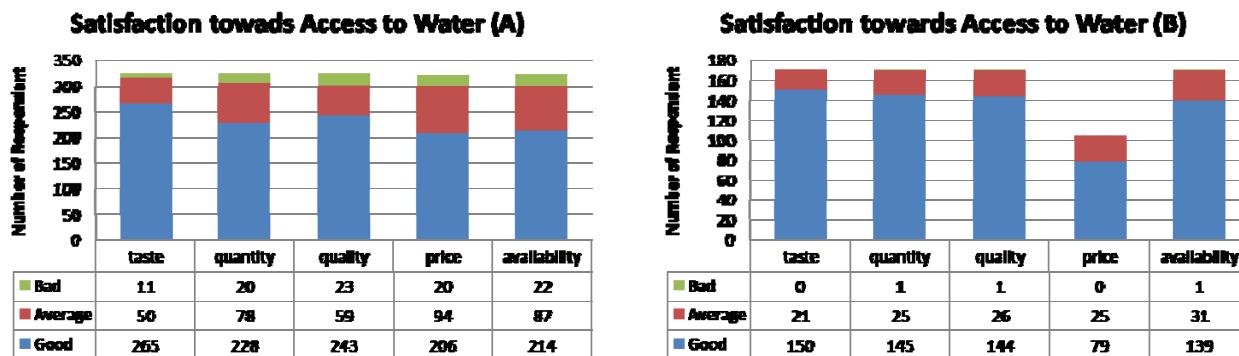


Figure 4. The Respondents' Opinion towards Current Water Services

(A) The Respondents of PDAM & HIPPAM, (B) The Respondents of Individual Well & Communal Hydrant

Referring to Figure 4 (A), the whole estimation towards 5 variables of water in the view of the greater part of the respondents in the Group 1 (71%) is highly satisfied. The highest satisfaction is related to taste of water that 81% of the respondents like the fresh taste of the water from the natural springs. Furthermore, it is also showed from the respondent's satisfaction towards quality of water (75%) that they take pleasure in the good taste and quality of their water. Meanwhile, the respondents who satisfied towards quantity and availability of the current water are lower than their previous satisfaction. Around 70% of the respondents think that the quantity of water is good, and around 66% of the respondents think that the water availability is good. Essentially the respondents obtain clean water for 24 hours but during the peak hours (in the morning and in the evening) the amount of water slightly reduces. The lowest satisfaction towards access to water from water service provider is related to price that only around 64% of the respondents satisfied to the price of water.

In addition, there are 23 of the respondents do not pay the monthly charge. Although, referring to Table 1, the HIPPAM's respondents are highly satisfied toward current water supply system when about their water satisfaction through question "do you satisfied in current drinking water condition?" using three categorize that good = 3, average = 2 and bad = 1.

Table 1. Mean of the Respondents' opinion towards Water Satisfaction

Mean	Taste	Quantity	Quality	Availability	Price
PDAM	2.53	2.28	2.42	2.25	2.14
HIPPAM	2.91	2.88	2.75	2.81	2.81

Moreover, majority of the respondents spend around less than 1% of their income for water consumption that mean of water price per month per household is IDR 5,000 (¥ 50) and mode of income per month per household is IDR. 750,000 (¥ 7,500).

Referring to the JBICI Research Paper No. 21, hypothesis that can be derived as appropriate solution to sustain a kind of collective action in HIPPAM due to the problem of "free-riding" is do not rely on the allocation of ownership to individuals or government intervention, but allowing the member of club goods to participate in establishing collectively the rules for utilization. This scenario opens opportunity to develop an optimal price for water maintenance and set up suitable price mechanism that also covers the limitation of ability to pay of the poor respondents.

(4) Community Network

In order to deepen understanding about the community network in the study area, the respondents were asked about "Do you agree or disagree with the following statement: People here look out mainly for the welfare of their own families and they are not much concerned with community welfare?" There are four alternatives of answer using 4-scale from 1 = strongly agree to 4 = strongly disagree.

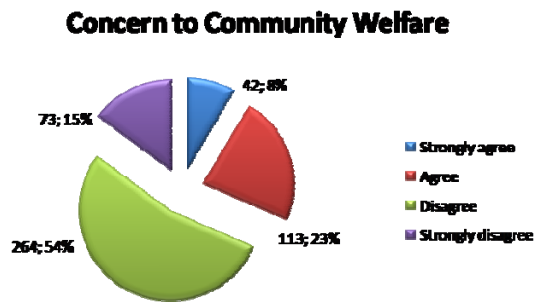


Figure 5. Concern of Respondents to Community Welfare

Answer of the HIPPAM's respondents are (1) Disagree (57%), (2) Agree (20%), (3) Strongly Disagree (17%), and (4) Strongly Agree (7%), respectively. In addition, their concern towards community welfare is relatively high with mean 2.83.

Then the respondents were asked about "If there is any problem with water such as a water pipe broke, how do you do?" with 5 given choice of alternatives. The alternatives of the HIPPAM's respondents are (1) contact to management of HIPPAM for asking to fix it (47%), (2) fix it by myself (37%), (3) ask neighbor any help to fix it together (13%), (4) else (6 respondents or 3%), and (5) no idea and leave it (1 respondent), respectively. It indicates that the management of HIPPAM is quite good due to structure of organization. Moreover, the whole residents have highly significant concern and responsibility towards their water facility, except three of the respondents who has no attention towards seeking of water problem. It also indicates that there is higher level of civic engagement in the study area that is showed from involvement of the residents in community improvement activity on solving water problem. Even though, there no regular meeting among club goods member and mean of important and benefit of the club for them around 3 in scale 1 to 5.

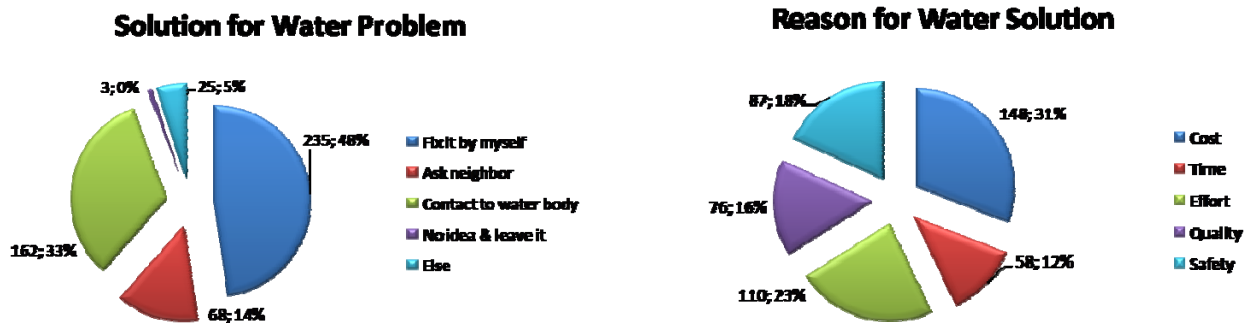


Figure 6. The Respondents' Opinion towards Solution of Water Problem and Reason

The next question for the respondents was about "Regarding to your answer about solution of water problem, what is the main reason to choose the answer?" with 5 given choice of reason. The reason for the HIPPAM's respondents are (1) Safety (29%), (2) Cost (26%), (3) Effort (24%), (4) Time (12%), and (5) Quality (9%), respectively. It illustrated that safety, cost and effort are the major consideration of the choice of alternative solution for water problem.

These three questions indicate that under their financial and human capital limitation the residents still can develop their community welfare through their strong community network. These findings are also analogous with the hypothesis that the strong community network might be possible to enhance participatory movement of the community as well as increasing their willingness to pay.

5. Conclusion

- Collective action of the HIPPAM's respondents makes their club goods gain high level of water satisfaction, even though there is the problem of "free riding" remained exist. Therefore, the hypothesis that might be raised is allowing the member of club goods to participate in establishing collectively the rules for utilization more effectively such as through more intensive regular meeting.
- There is strong community network shows from (i) strong concerned towards community welfare, (ii) active involvement on solving water problem by consideration their own physical and human capital limitation, (iii) strong bridging social capital between the respondents and the intimates' people residence, e.g. it indicates from the common help to the respondents without access to water to obtain water freely.
- Sturdy community network that is showed by strong bridging social capital in the study area has both positive and negative effects of the access to water. This community network brings the respondents without access to

water still has possibility to obtain water easily. But in the other hand, this intimate relationship also hinders the respondents from personal direct access to clean water. It indicates that without proper water management it is difficult or impossible to put aside the “free-riding” and develop sustainable community managed water supply system for the people.

- Further research related to appropriate water price strategy to deal with issue of water allocation and water right as well as sustainability of water is necessary to conduct. The existence of “free-riding” no longer could be handling under a pure community agreement. Economic value of water related to ability to pay and willingness to pay of the respondents need to set up as appropriate water price that will secure adequate of water through mechanism of community managed water supply system.

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