SOCIAL CAPITAL FOR ACCESS TO CLEAN WATER IN RURAL AREA

(Case Study: Sumberrejo Village, Lumajang)

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Abstract

Nowadays, access to drinking water services in Indonesia still not on SDG's target where 100% of society should have access to clean water. Based on data from the ministry of public works and public housing (2015), there are only 59,7 percent of Indonesians receiving piped water access through the Indonesian regional water utility company (PDAM) and only 7,474 villages (from 72.944 villages) have been supported to establish community-based organizations (HIPPAM) to manage local water supply services. Sumberrejo village is one of the villages which can manage water by establishing HIPPAM. Therefore, it is necessary to know the social capital through the social structure of Sumberrejo society. The aim of this research is to trace the social capital in Sumberrejo village through the community participation so that HIPPAM Tirta Buana can be formed. This research use SNA (Social Network Analysis) as a method to know the social network of society which is measured by density, centrality and participation level. From the calculation of SNA can be seen that the value of density, centrality, and level of community participation in Sumberrejo village is good. The bonds formed from the HIPPAM community are strong. The result of this research can be concluded that the existing social capital is a bonding social capital which can be developed by utilizing actors with high centrality value in order to deliver information related to clean water.

Keywords: Social Capital, HIPPAM (Residents Association of Water Users), Social Structure, Social Network Analysis (SNA)

1. INTRODUCTION

Water is an important part of natural resources that gets priority because the need for clean water affects the lives of many people. Handling for clean water can be adapted to the need for clean water and supporting facilities and infrastructure.

based on data there are only 59.7 percent of Indonesians receiving piped water access through the Indonesian regional water utility company (PDAM). Therefore, only 7,474 villages (from 72,944 villages) have been supported to establish community-based organizations (HIPPAM) to manage local water supply services. so it can be seen that there are still many people who do not have access to clean water in urban as well as in rural areas. This shows the importance of meeting the need for clean water outside the PDAM pipeline system.

Lumajang District was appointed to be one of the implementers of the Water and Sanitation project for low-income communities working with the World Bank starting in 2002. From this it is required that each village should be able to meet sanitation and clean water needs. The components of the project include the provision of clean and basic sanitation facilities, which are safe, adequate, accessible and cost-effective with participatory community-based assessment methods.

Currently, Lumajang Regency has 67 springs spread over 17 sub-districts, one of them in Candipuro Sub District (RTRW Lumajang 2011-2031) which is still not fully utilized. One of the villages that is able to fulfill their clean water needs through a piping system is Sumberrejo Village.

Sumberrejo village has two springs, one of which is used to be a source of clean water by the community by delivering water from the source to the people's house through pipeline. This can be done with the initiative of the community to propose the development of clean water distribution system so that the HIPPAM

organization is formed. HIPPAM Organization Sumberrejo Village was formed with the initiative of the village head who held a deliberation to submit a proposal to the Provincial Public Works Office of East Java in 2011. Approval of the proposal by the Provincial Office of Public Works of East Java resulted in assistance in the implementation of development. Furthermore, the results of development are left to the community and village apparatus to be maintained through HIPPAM institution called HIPPAM Tirta Buana.

Untill now, water supply through HIPPAM still includes 3 hamlets from 5 hamlets in Sumberrejo village, so not all villagers are able to access clean water from HIPPAM. The three villages are Panggung Nongko Hamlet, Candilor Hamlet, and Krajan Hamlet. Therefore, it is necessary to trace the social capital in Sumberrejo village through the community participation so that HIPPAM Tirta Buana can be formed. The aim of this research is to trace the social capital in Sumberrejo village through the community participation.

2. DATA SETS

In this study, the focus is on social networks to represent the social relationships between actors and a set of relationships through the membership of multiple actors in the community groups in Sumberrejo Village. Data were collected through surveys to respondents through interviews and using questionnaires. In addition, secondary data is also used to complement the results of research

To get a sample of respondents who can describe the population in this study used slovin formula. This is because the research is done in the village with the characteristics of respondents homogeneous with the formula (1):

$$n = \frac{N}{1 + ne^2} \tag{1}$$

where n is sample size, N is population size, e is margin on error.

According to Lumajang District government data, the population of Candilor Hamlet, Nongko Stage, and Krajan is 845 families. Thus, it can be seen that the number of samples with a tolerance limit of 5% is 271 families.

In this research there are two kinds of population because social capital which want to know is social capital from member of HIPPAM and non HIPPAM. Because the research focused on HIPPAM in the provision of clean water in Desa Sumberrejo, the population of all HIPPAM respondents was used so that it can fully show how the participation of HIPPAM community with the number of respondents is 98 families. For non HIPPAM respondents, random sampling was conducted on non-HIPPAM populations because the location of non-HIPPAM community is still unknown so that every non HIPPAM family can have equal opportunity to be respondent. The number of non HIPPAM respondents was obtained from the total sample size minus the number of HIPPAM respondents, thus the number of non HIPPAM respondents was 173 families

3. SOCIAL NETWORK ANALYSIS

To know social capital, used Social Network Analysis (SNA) method by analyzing rate of participation, density, and centrality index. Public relations is seen from the participation of the community on the existing institutions in Sumberrejo Village.

3.1. Rate of Participation

Rate of participation can be calculated through the formula (2):

$$\bar{a}_{i+} = \frac{\sum_{i=1}^{g} \sum_{j=1}^{h} a_{ij}}{g} = \frac{a_{++}}{g} = \frac{\sum_{i=1}^{g} x_{ii}^{N}}{g} \tag{2}$$

Where g is node, h is number of institutions, x_{ij}^{N} is matrix of respondent participation.

3.2. Density

This analysis is used to determine the density of a network in the social structure of society calculated using the formula (3).

$$\Delta(N) = \frac{\sum_{i=1}^{g} \sum_{j=1}^{g} x_{ij}^{N}}{g(g-1)} \; ; i \neq j \tag{3}$$

Where $\Delta(N)$ is density size, g is node, (g-1) is isolated respondent, x_{ij}^{N} is primary matrix from respondent i to j, and L is number of lines connected between nodes.

3.3. Centrality

The analysis of centrality aims to determine the strength and influence of individuals (nodes)

that play the most role in a social network in society. The measure of centrality here uses betweenness, closeness, and degree. Thus, it will be easier to know the knot knot strength of the community, so it can be used as one of the means to urge people to use clean water piping in Sumberejo Village.

4. RESULT AND DISCUSSION

4.1 Study Area

Sumberrejo village has an area of 826.7 Ha which is divided into five hamlets namely Krajan Hamlet, Sumberrejo Hamlet, Bulak Manggis Hamlet, Candilor Hamlet and Panggung Nongko Hamlet. In general the administration of Sumberrejo Village is as follows:

North: Kloposawit Village

South: Sumberwuluh Village

East: Candipuro Village

West side: Penanggal Village

4.2 Water Supply System by HIPPAM n Tirta Buana

The drinking water supply system (SPAM) managed by HIPPAM is included in the communal water supply system with the following components:

A. Source System

The source of water used by HIPPAM is located in Panggung Nongko Hamlet. This water source is a spring so that water from the source is flowed to the main substation near the water source. The water source is at an altitude of 408 above sea level. Until 2013 there is no calculation of water debit for sure. However, it is estimated that the available water is sufficient for the provision of clean water in Sumberrejo Village due to the never-dry water source.

B. Transmission System

The transmission system is the stage of the water flow to the treatment basin or the water tanks through the transmission pipes. Transmission system in Sumberrejo Village is by gravity system, that is water transportation system by using gravity of earth. This is because the location of the water source located at a higher altitude than the area served so that it does not require a pump to drain the water. Water from the spring in Panggung Nongko Hamlet is flowed to 7 water tanks with a capacity of 3000 liters / tandon in 3 hamlets. The pipe used in this transmission system has a size of 3 dim with PVC material. Until now the main pipeline to

deliver water to customers has reached 4 kilometers.

C. Distribution System

Distribution system is water drainage system from water tank or from main pipe to customer. The number of houses served until now is 98 homes. Distribution system using gravity system with PVC pipe size 0.5-1 dim in accordance with customer demand. The following is a drinking water supply system by HIPPAM Sumberrejo Village.

Figure 1. Water Supply System
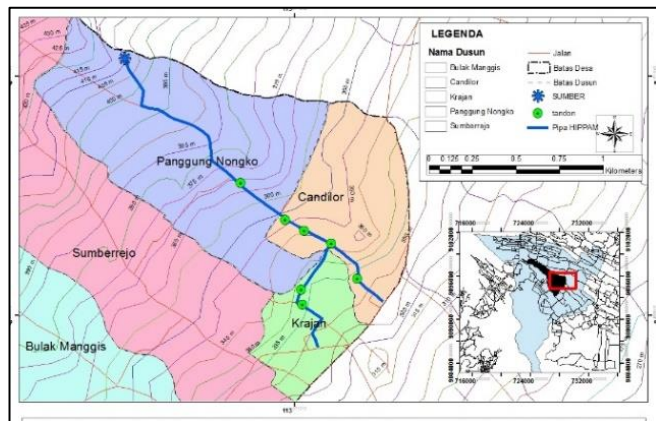
4.3 Rate of Participation

The level of community participation in Sumberrejo Village will be calculated through the formula by comparing the level of community participation of HIPPAM Tirta Buana members and non-members in Panggung Nongko Hamlet, Candilor Hamlet and Krajan Hamlet.

Table 1. Rate of Participation (ROP)

Hamlet	Sample	ROP	Category
Panggung Nongko	HIPPAM	**2,212**	Medium
	Non HIPPAM	1,0724	Low
Candilor	HIPPAM	2,033	Low
	Non HIPPAM	0,7916	Low
			Low
Krajan	HIPPAM	1,45	Low
	Non HIPPAM	0,9104	Low

From the calculation can be seen the difference in the level of community participation in Sumberrejo Village. There is only one group of respondents who have a

moderate level of participation ie the HIPPAM group Panggung Nongko Hamlet. Besides, the other five groups of respondents have low participation rate. However, although the participation rate of respondents is low, it can be seen that respondents who are members of HIPPAM have higher participation than non HIPPAM respondents. From the calculation results, it can be seen that the average respondent follows two similar institutions.

4.4 Density

In general, the value of density can be seen from the total number of a relationship relative to the total number of possible relationships that occur.

Table 2 Density of Sumberrejo Society

NO	Hamlet	Sample	Density
1	Panggung Nongko	HIPPAM	0,968
		NON HIPPAM	0,443
2	Candilor	HIPPAM	0,912
		NON HIPPAM	0,451
3	Krajan	HIPPAM	0,905
		NON HIPPAM	0,379

The density value of HIPPAM community in Panggung Nongko Hamlet, Candilor Hamlet, and Krajan Hamlet close to 1 indicates that the density of HIPPAM users is high. That is, all community respondents HIPPAM users interconnected between the one with the other.

4.5 Centrality

In this research, a centrality analysis is use to find out the individual (node) that play the most role in Sumberejo Village. Centrality gives an indication of the size of the actors' power seen from how they are interconnected within a network.

The centrality of HIPPAM and non HIPPAM communities in Sumberrejo Village has mixed results. The centrality of the HIPPAM community tends to be higher than non-HIPPAM. For the degree value calculated with one-mode centrality as a whole the HIPPAM members are close to 1.

This means that all HIPPAM respondents in the three hamlets are connected to a high value so that each actor has a wide network. Meanwhile, for non-HIPPAM communities, there are various degree values that are high, medium and low. The presence of a society that has a higher value than others indicates that there are actors and central organizations within the network. It is this central actor who will assist in disseminating information related to HIPPAM organization and institution. Nevertheless, the degree values that tend to be low in non-HIPPAM communities resulted in each actor having a less extensive network.

The value of closeness that is in the medium and high level illustrates the proximity of the relationship between respondents is good. Existing network patterns describe the narrow network so that in the dissemination of information does not require many intermediaries in the network. As for non HIPPAM community, the value of closeness tends to be low so that the existing network is wider than the HIPPAM group network, meaning that if given information to non HIPPAM respondents require a lot of intermediaries for the delivery of such information.

The low betweenness value shows that there are no connecting actors in the network in the HIPPAM respondent group so that all actors have the same role. Nevertheless, the dissemination of information still in the HIPPAM group will not be hampered because it is supported by high degree of degree and closeness. As for the non-HIPPAM community, there is a high betweenness value in Panggung Nongko Hamlet. The existence of this intermediary will assist in the delivery of information and assistance. However, due to the degree of degree and low closeness, in the other two hamlets, the absence of intermediaries will complicate the empowerment of communities through development.

Netdraw from the calculation of centrality in the three hamlets shown in Figure 2 to Figure 7. The red node indicates

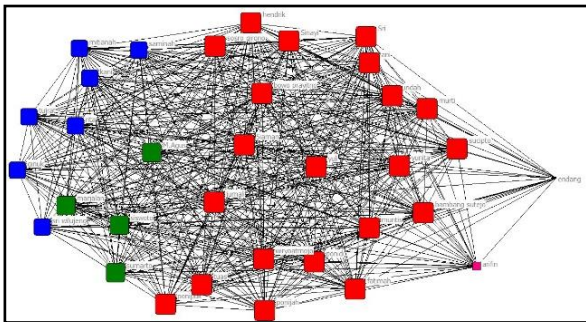that the node has the highest value on the network followed by blue and other colors.

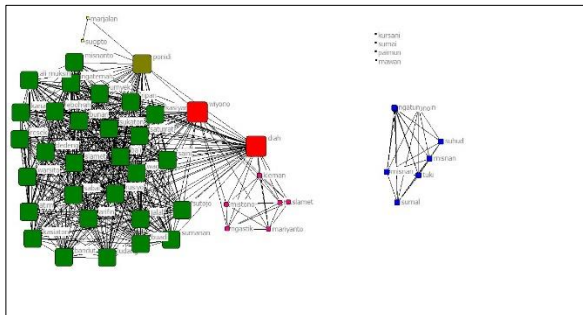Figure 2 Network of HIPPAM Panggung Nongko Hamlet

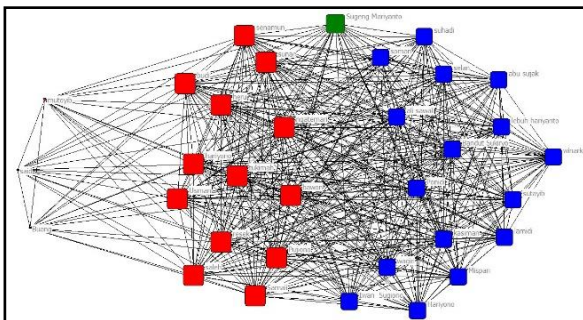Figure 3 Network of non-HIPPAM Panggung Nongko Hamlet

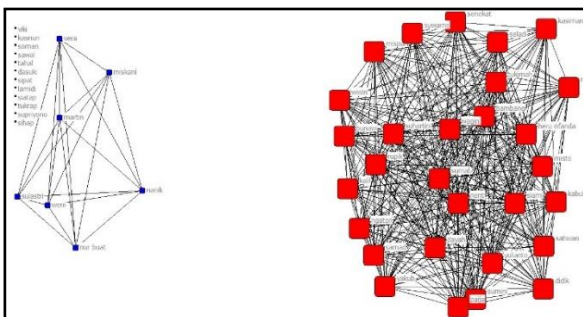Figure 4 Network of HIPPAM Candilor Hamlet

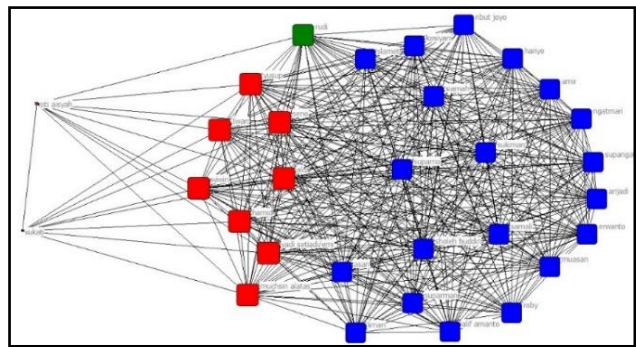Figure 5 Network of non-HIPPAM Candilor Hamlet
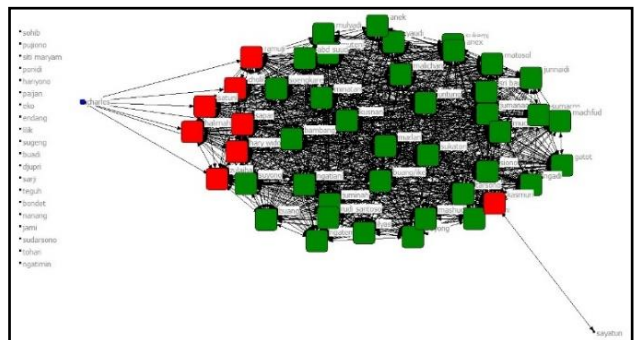

Figure 6 Network of HIPPAM Krajan Hamlet

Figure 7 Network of non HIPPAM Krajan Hamlet

The calculation of degree of centrality has not yet shown who the central actors are in each group of respondents. Therefore, the calculation is continued by using two-mode centrality with matrix input in the form of relationship matrix between actor and institutional.

The calculation result of two-mode degree centrality in the community group HIPPAM Dusun Panggung Nongko, Candilor Hamlet and Krajan Hamlet, the actor who has the highest score is not individual but one of the institutions in Sumberrejo village that is "pengajian". The high two-mode degree value reflects that the study institution can reach all the respondents in the network. The high value of the degree of this study institution can be utilized in the delivery of information about HIPPAM to the public. Pengajian institutions can be utilized optimally to help socialization about the provision of drinking water piping healthy.

For the value betweenness centrality can be categorized as low. From the hamlets, the same pattern is produced. The low centrality betweenness value indicates that no society occupies the position of mediator or liaison between one another. All respondents have almost the same role in the network. Thus, more facilitate in the delivery of information because each respondent directly connected with others

which is also indicated by a high value of closeness.

4.6 Social Capital

In general, the social structure of Sumberejo villagers has a low level of participation (HIPPAM better than non-HIPPAM) of average respondents following two similar institutions. Meanwhile, the density of HIPPAM users is close to 1 indicating that the density of HIPPAM users is high. Conversely the value of non-HIPPAM respondent density is closer to 0 so it can be seen that not all communities are connected. The network formed by the HIPPAM group is narrower than the non-HIPPAM group. This will lead to the dissemination of information to non-HIPPAM community members will be more difficult than the HIPPAM community. HIPPAM respondents' degree, closeness, betweenness rating is higher than non HIPPAM respondents, facilitating the dissemination of information by utilizing central actors in each group. In addition to community leaders, institutions that have a high degree value of pengajian, also can be used for socialization and exchange of information about HIPPAM.

Institutions that are followed by the Sumberrejo Village community are mostly internal institutional in village level. The diversity of institutional level followed by HIPPAM and non HIPPAM communities is evidenced by community participation in 1 or 2 institutions.

This situation leads to the bonding of social capital (Woolcock 2000). Social capital like this can be developed by using actors with a high centrality to make information delivery becomes easier.

5. CONCLUSION

Social capital is influential in community initiatives to meet clean water needs. the initiative is illustrated by the establishment of the Sumberrejo Village HIPPAM. Existing Social Capital leads to the bonding of social capital (Woolcock 2000) which can be developed by utilizing actors or institutions with higher centrality values to mediate with other party groups in order to deliver information related to access to clean water easier.

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