

The influence of collective action, community empowerment, and shared vision to the community capacity in urban water resource conservation

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Abstract. Climate change in Indonesia has led to soaring phenomena of extreme drought and floods, making it a formidable challenge for the sustainable water resources management, especially for the city of Jakarta. The increasing population and density of Jakarta have led to a higher demand of housing in the city. Many residents with low income are live in lands around river banks which often flooded. The present research has the objective to determine the spatial pattern of urban community capacity for water resource conservation in 4 different locations, based on the distance to the lake; and to find out how are the effects of collective action, community empowerment and shared vision on the community capacity in Lake Cavalio and Lake Kampung Bintaro. The data were analyzed using both analytical techniques of principal component analysis (PCA) and double linear regression analysis. The study shows that there are impact differences between the three variables on community capacity regarding lake conservation. However, those differences are not related to the distance from the lake. These results demonstrate differences in previous research, where community empowerment becomes the variable with the most significant effect. This finding describes that the construction of the lake can be an effective solution for the flood-affected communities, and the flood experience can build a similar perception and vision in the community.

1. Introduction

Water is a basic need for the human. Water crisis is worsened by the climate change threat. The current climate change will bring draught for several areas while other areas will get wetter. A few areas experience drought and water deficit, while other areas experience a flood. The phenomena can be challenging for water management, especially for the city of Jakarta. Pesanggrahan River is one of the 13 rivers run through Jakarta. Therefore, Balai Besar Wilayah Sungai Ciliwung Cisadane (BBWSCC) or Big Hall of Ciliwung Cisadane River Area has run the normalization program of Pesanggrahan River. One of its activities is building retarding basin from river and swamp bends to contain the overflow from Pesanggrahan River. This retarding basin is what is known by locals as a lake. Brinkman et al. [1] quantitatively found three forces that influence the community capacity in river conservation, which are collective action, community empowerment, and shared vision. Collective action is a form of cooperation in a community group to overcome various threats, both internal and external [2]. Meanwhile, community empowerment is the ability to gain the knowledge about how to solve a problem and use existing skills to make changes [3]. A shared vision is related to



the perception and values of a community group. The difference between this research and the research done by Brinkman [1] is this research is not only aimed to test the theory but also to find out the differences of impacts in different areas by dividing the location into 4 clusters based on its distance from the lake.

Based on the formulation of problems explained, the objectives of this research as in the following:

- To determine whether the collective action, community empowerment, and shared vision variables influence the community capacity in the conservation of Lake Cavalio and Lake Kampung Bintaro.
- To compare the influence of collective action, community empowerment, and shared vision towards community capacity in lake conservation at different locations.

2. Methodology

2.1. Research approach

In This research uses causal design as its research design Causal design is a research design used to explain the connections of variables based on hypothesis tests. The approach used for the research is the quantitative approach. The quantitative method is used to test a theory and examine connections between variables [4].

2.2. Data collection technique

There are 300 questionnaires distributed in 4 clusters. The questions in questionnaires refer to the experiments done by Brinkman [1] with a few modifications according to research area characteristics. Theresearch conducted from January to May 2018. Preparation and observation phase of the research were done since January 2018 and the data collection period through questionnaire distribution was done from April 21, 2018, to May 10, 2018.

2.3. Research location

Research locations are divided into four clusters as seen in Figure 1 below to examine the differences in community capacity space and the effects of its components variables on locations with different distances from the lake.

- Cluster 1: location around Lake Kampung Bintaro
- Cluster 2: location around Lake Cavalio
- Cluster 3: located on the north side of Cluster 1, this location is chosen as a comparison to Cluster 1 which are located closer to the lake.
- Cluster 4: located on the south side of Cluster 2, chosen as a comparison to Cluster 2.



Figure 1. Research location
(Source: Researcher's data processing, 2018)

3. Result and Discussion

Housing pattern in research location as seen in Figure 2 is a housing unit which consists of a simple building structure that clenches with one another.



Figure 2. Research location condition
(Source: Researcher's documentation, 2018)

The housing group is commonly not bordered by fences as a sign of ownership. The road in this location does not only function as accessibility but also as a meeting point and public space for the inhabitants, it can be seen that there are potentials for community interaction and socialization in the neighborhood. The demographic conditions of respondents can be seen at Table 1.

Table 1. Demographic characteristic

Demographic Characteristic	Frequency			
	Cluster 1	Cluster 2	Cluster 3	Cluster 4
House Ownership Status				
Owned	68	68	80	52
Leased	32	32	20	48
Place of Birth				
Lake Area (Around the lake)	62	38	7	7
Jakarta	29	29	72	36
Outside Jakarta	9	33	21	57
Flood Experienced by Respondents				
Always Flood	13	9	8	0
Sometimes	11	3	24	8
Never	45	36	58	35
No longer experienced Flood since the lake was built	31	52	10	57
Work Location				
Workaround the lake	37	50	26	70
In South Jakarta (about 1-hour trip)	12	21	17	18
Outside South Jakarta (more than an hour)	51	29	58	2

Source: Personal data processing, 2018

3.1. Collective action

Based on highest factor loading score in PCA analysis (table 2), there are similarities in the highest factor which contribute to the variable formation of collaborative governance in four clusters, which is good work from the government by providing information related to the issues faced by the society. The factor which has the highest contribution toward social network in Cluster 1, 2 and 3 is strong social ties variable, meanwhile, in Cluster 4 is helpfulness and trust. These findings support respondents' data, which Cluster 4 owns more heterogenic characteristics compared to other clusters and the percentage of new people inhabiting the location is higher than other clusters, therefore the social ties formed is not as strong as the three other clusters.

Table 2. Loading factor of collective action

Variable	Factor	Questionnaire item	Loading Factor				
			Cluster 1	Cluster 2	Cluster 3	Cluster 4	
Collective Action	Collaborative Governance	Listening about community problems	0.644	0.741	0.410	0.385	
		Trust the leader	0.513	0.734	0.634	0.107	
		Believe the decision making process	0.737	0.737	0.491	0.066	
		informing about community problem	0.766	0.894	0.681	0.884	
		active participation in decision making	0.718	0.559	0.665	0.276	
		The people who are most affected are included in community problem solving activities	0.681	0.703	0.672	0.184	
		Government, nonprofits, businesses and residents consistently work together	0.573	0.110	0.680	0.799	
		Community leaders adequately represent the diverse groups	0.546	0.734	0.612	0.379	
		good coordination among service providers	0.583	0.828	0.727	0.878	
		I have the appropriate amount of influence in community-level decision making	0.428	0.106	-0.194	-0.287	
		Trusting of government	0.562	0.259	0.584	0.164	
		Social networks	help each other	0.841	0.437	0.880	0.980
			have strong social ties	0.883	0.875	0.898	0.901
			trust each other	0.768	0.788	0.821	0.980

Source: Personal data processing, 2018

3.2. Community empowerment

Community empowerment variable shows different results in each cluster. In Cluster 1, the most contributing factor is the ability to learn from previous flooding experience to cope with the flooding problems. In Cluster 2, it is the agreement on the environment plan made. In Cluster 3, it is the effectiveness in overcoming an environmental health problem, and in Cluster 4, it is the community ability in recognizing problems and needs faced by the community. Based on these findings, it seems that each cluster has different environmental challenges which affect the community's competence and ability.

Table 3. Loading factor of community empowerment

Variable	Factor	Questionnaire item	Loading Factor			
			Cluster 1	Cluster 2	Cluster 3	Cluster 4
Community Empowerment	Community competency	Developing common goals	0.579	0.714	0.418	0.589
		Agreeing on actions to achieve goals	0.646	0.719	0.450	-0.090
		Working together	0.627	0.467	0.618	0.040
		Identifying problems	0.540	0.585	0.605	0.913
		Learning from the past	0.813	0.539	0.178	0.630
		Working with other communities	0.596	0.464	0.419	0.377
		Natural environment	0.600	0.642	0.499	-0.039
		Social relations	0.733	0.443	0.635	0.389
		Local economy	0.588	0.264	0.650	0.584
		Health and Wellness	0.540	0.385	0.690	-0.532
		Infrastructure	0.177	0.570	0.655	0.420
		Water Quality	0.302	0.404	0.401	0.366
		Strong Leadership	0.485	0.573	0.514	0.410
		Sense of Responsibility	homeowners can influence water quality	0.712	0.635	0.802
	The way to develop a house can influence water quality		0.745	0.839	0.806	0.910
	Using recommended practices		0.799	-0.461	0.498	0.147
	Willing to change		0.814	-0.562	0.244	0.157
	The economic stability of my community depends on good water quality		0.799	0.651	0.172	0.818

Source: Personal data processing, 2018

3.3. Shared Vision

In a shared vision variable, the most contributing factor on the perception of disaster threats, the results are similar. All four clusters are no longer worried about flood disaster but worried about the scarcity of clean water.

Table 4. Loading factor of shared vision

Variable	Factor	Questionnaire item	Loading Factor			
			Cluster 1	Cluster 2	Cluster 3	Cluster 4
Shared Vision	Perception of environmental threats	Perception of Flood Disaster	0.699	0.687	0.434	0.672
		Perception of Drought Disaster	0.693	0.775	0.774	0.768
		Contaminated Groundwater	0.823	0.778	0.857	0.873
	Issues related to growth and development	Loss of fish species	0.743	0.499	0.773	0.378
		Contaminated lake	0.592	0.712	0.338	0.552
		Increasing sprawl	0.727	0.822	-0.215	0.515
		Increasing Traffic	0.596	0.728	-0.439	0.374
		Increasing demands on infrastructure	0.418	0.552	0.040	0.072
		Loss of agricultural lands	0.792	0.333	0.600	0.889
		loss of community character (help each other)	0.748	0.747	0.774	-0.371
		Loss of forested	0.661	0.497	0.654	0.721
		Natural landscape	0.891	0.832	0.870	0.972
	Environmental sense of place	Presence of trees	0.849	0.915	0.769	0.956
		Presence of outdoor recreation	0.866	0.741	0.693	0.975
		clean environment	0.727	0.940	0.385	0.786
	Quality of life	Healthcare Services	0.751	0.942	0.825	0.986
		Social Services	0.737	0.883	0.765	0.986
		Cleaning Services	0.813	0.856	0.639	0.986
Opportunity to earn adequate income		0.640	0.680	0.154	0.677	

Source: Personal data processing, 2018

Based on an analysis of the findings above, it can be stated that:

- Cluster 1, which is the area around Lake Kampung Bintaro has a social characteristic in which the majority of its residents were born in the research locations so that social bonds are strong. This is aligned with the theory of Mishra et. al (2010) [5] which states that hereditary factor affects emotional attachment to the place and social intimacy in that place. Past flood experiences make community competence formed from the community's ability to learn the past in order to solve challenges in the future, and there is a responsibility through awareness to change bad habits. From all the findings, the strong social bond becomes a factor which is also a characteristic of communities around Lake Kampung Bintaro.
- Cluster 2, which is a community around Lake Cavalio, is an area with the quite heterogeneous community with various origins between the people who were born around the lake (38%), in Jakarta (25%) and outside Jakarta (33%). It apparently has strong social ties. The difference between this area than others is the existence of farmers' community which holds an important role in Lake Cavalio management. The farmers' community becomes an indicator of community competence formed by how effective the communities agree on the environmental plan. This competence becomes an advantage compared to the other three areas.
- Cluster 3, the community in the north side of Cluster 1. Unlike three other areas, this area located on a higher ground so that so it spared from flooding. Even though 49% of the

community were not born in the location, social ties in the area are really strong and become the most contributing factor of the social network. Based on the results of the highest contributing factor on community's perception in development issue, the decrease of mutual cooperation attitude becomes community's main concern. The decrease is caused by the work locations of the people living in the area is situated outside South Jakarta. The long distance between house and work location can cause social relation between community members to become less intense so that it can decrease the mutual cooperation attitude.

- Cluster 4, the area in the north side of Lake Cavalio, if the other three areas are dominated by owned houses, in this cluster the percentage of the community who lives in leased houses almost the same as the percentage of people who own a house. Other than ownership status, the amount of people living in the location for less than 5 years is also higher than in other areas. Since the duration of stay affects emotional bond on location, this condition causes social ties do not contribute to the social network in the area. This finding strengthens by Goodman (1998) [3] which states that people who are living temporarily will feel that they do not have interests, and people who do not have interests will have a low level of involvement, which will affect the social network. Other than house ownership status, the community's spending is also lower compared to the other three areas. Spending level shows a community economy level, and this finding strengthens Swapan (2015) [6] that economic factor affects participation level. The community with low income, the awareness for participation process is also lower.

Moreover, the relationship comparison between three variables toward community capacity in four clusters can be seen in the table below:

Table 5. Summary of regression analysis result

Variable	All areas	Cluster 1	Cluster 2	Cluster 3	Cluster 4
Collective action (X1)	0.000***	0.000***	0.336 ^{ns}	0.058*	0.737 ^{ns}
Community Empowerment (X2)	0.222 ^{ns}	0.825 ^{ns}	0.287 ^{ns}	0.992 ^{ns}	0.001***
Shared Vision (X3)	0.004**	0.005***	0.959 ^{ns}	0.137 ^{ns}	0.001***

*** : Significance level under 1%

** : Significance level under 5%

* : Significance level under 10%

ns : not significant

Source: Personal data processing, 2018

Based on table 5, there are differences between the impacts of the collective action, community empowerment, and shared vision variables to community capacity in different areas. These three variables' effects show different results than previous results which state by Brinkman (2012) which community empowerment becomes the variable that gives significant and strong impact toward community capacity in Kaskaskia watershed conservation in the United States of America. This is compatible with the conception that empowered and enabled community will, of course, have a better capacity. Meanwhile, based on these research findings, dominant influence is different in Cluster 1 and Cluster 4. If in Cluster 1, area around Lake Kampung Bintaro, the significant impact is collective action and shared vision variables with the highest significance level is collective action variable. In Cluster 4, empowerment and shared vision variables become variables with high significance level. The difference between these effects because there are differences in the physical, social and economic condition.

4. Conclusion

There are differences in the effect of collective action, community empowerment, and shared vision toward community capacity in lake conservation on four research locations, but those different impacts do not relate to location distance to the lake. Different physical characteristics of the areas implicate the challenges faced by a community and it can influence the community's attitude and perception. The combination of area characteristics and social, economic characteristic, and community demography in an area can cause different social dynamics which lead to different factors influencing community capacity in lake conservation. Community empowerment variable is the most significant variable on community capacity in water resources conservation in the previous research. However, in this research, it is not fully proven. The flood experienced by the communities has built a shared vision in the society, which is important to grow the feeling that communities do have interest on water resources, and that their actions can have direct effects on them. Understanding the differentiation of social characteristics can help improve the community capacity as an important step in community-based water resource management, especially in facing of climate change challenges.

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