

The Role of Social Capital in Management of Baros Mangrove Conservation Area Yogyakarta

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Abstract

The coastal area in Baros is frequently flooded and influenced by tides during the high tide. The mangrove ecosystem in this area has decrease severely. As the result, the coastal area is unprotected, and several negative impacts received by the coastal area. Inadequate concern coming from government, negative impact of natural disaster, as well as the high concern of local community leads to the establishment of mangrove replant program and mangrove eco-tourism establishment. Baros Youth Group which concern in environmental protection and management in Baros Coastal Area. The activities facing many challenges and obstacles. Therefore, collaboration with government, community, private party and academics leads to the success of Baros Youth Group to overcome the challenges and obstacle. This study was aimed for understanding the role of social capital in the management of Baros Mangrove conservation area. The study consists of four stages, which are observation, data collection, data processing and analysis. Data collecting process was done in accordance with the parameters of social capital which are consists of norms, trust and social network. The samples were taken by purposive method. The results of this study shown that the norms in society encourage them to respect each other and not disturb each other, the trust level is depended on the activities of society member, and the social network is high indicated by the increasing of community participation in planting mangrove seedlings.

Keywords: Conservation, Mangrove, Social Capital

Introduction Section

The world population had made the amount of demand for resources increasing in the last decades. In order to fulfill the demand, humans tend to utilize their environment to fulfill their needs such as food and water. As the consequences, loss of biodiversity and natural habitat, ecosystem deterioration, aquifer depletion (Cleland, 2013), urban health problem (Guria & Sinha, 2015) as well as increasing CO₂ emission increase (Weber & Sciubba, 2018) are inevitable. Indonesia is one of the Asian countries with massive population. Java is one of the Indonesian largest Island also as the most populated and densely populated Island in Indonesia. Many environmental problems, disaster and ecosystem issues originated from this Island.

Many actors show great concern in the environmental issues, including government, NGOs, and communities. According to Indonesia Constitution, Environmental management is Government authority. According to the regional autonomy regulation, environmental protection and management was delegated to local government with enhancement in the participation and role of local community in environmental protection and management (Mina, 2016).

Diverse model and approach of Community Based Environmental Management (CBEM) established. Delgado-Serrano et al (2017) mention five models in their study on CBEM in Latin America and the Caribbean. Local community involvement and their success in solid waste management as part of environment protection has been studied by Wijayanti & Suryani in 2015. Based on this study, they suggested that for CBEM it needs

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collaboration between government, public, and starts with building public trust towards the government capability and opening public aspiration also with the help of media. CBEM example for mangrove conservation is coming from Philippines. The program evaluation resulted that there were unclear access and utilization rights of local communities over the planted mangroves and poor ecological outcome (Pulhin et al., 2017). Agreement between local actors (community) as the conservation agent and government as the authorities for mangrove management is one of the key for a success mangrove CBEM, as shown in Bekasi West Java, Indonesia according to Ambinari, Darusman, Alikodra, & Santoso in 2015. Another term used for CBEM is Community Base Natural Resource Management (CBNRM). CBNRM become an important tool for ecological sustainability and improving community access to ecosystem service (Musavengane & Simatele, 2016). In the implementation of that program, social capital become one of the important aspects to the outcome of CBNRM.

Putnam (as cited in Woolcock, 1998) define social capital related to social organization such as trust, norms and network. Social capital refers to norms and networks that enable people to work together in community. Interaction between community and institution is important in community development. This provides benefits for the community. Raju (2004) in his study about social capital and poverty of the wage labour class stated that social capital became a basic concept that brings social activities functioning. Bouma, Bulte, & Soest (2008) also state that social capital is one of the factor for the success of community resource management. Adger (as cited in Torabi et al., 2016) describe that implementation of social capital in CBNRM is able to provide benefits from relationship among stakeholders in the community. Based on the description, it can be stated that social capital has an influential role in building a community.

KP2B (Kelompok Pemuda-Pemudi Baros) or Baros Youth Group is one of the local communities in Bantul, Yogyakarta, Indonesia, which concern in environmental protection and management especially in Baros Coastal Area. The concern mainly by reestablished mangrove ecosystem in Baros area. The coastal area in Baros is frequently flooded and influenced by tides during the high tide. Some of the land was gone affected by flood. The land used to be utilized as paddy field. There used to be a mangrove ecosystem in this area but has long been gone. As the result, the coastal area is unprotected, and several negative impacts received by the coastal area. Inadequate concern coming from government, negative impact of natural disaster, as well as the high concern of local community leads to the establishment of mangrove replant program and mangrove eco-tourism establishment. After the mangrove was grown many faunas came back to dwell like birds, mangrove faunas, etc. The other problem is a lot of waste found in this area, and potential to disrupts the growth of mangroves and their aesthetic. Currently, this location also developed into eco-tourism spot with KP2B as the driver. Establishment of CBEM in Baros facing many challenges and obstacles. Hard work, well established relationship with government, community, private party and academics leads to the success of KP2B to overcome the challenges and obstacle. This study was aimed for understanding the role of social capital in the management of Baros Mangrove conservation area.

Methodology

This study administered qualitative research methods. In qualitative research, research questions arise from certain cases and its result cannot generalize the population status, but somehow it can be applied to other places with the same characteristic (Sugiyono, 2009). The study area took place in Baros Hamlet, Tirtohargo Village, Kretek Sub-district, Bantul. The study location can be seen in Figure 1, and the mangrove conservation area is shown in Figure 2. This area is one of the conservation areas in Bantul that involve community in its management.

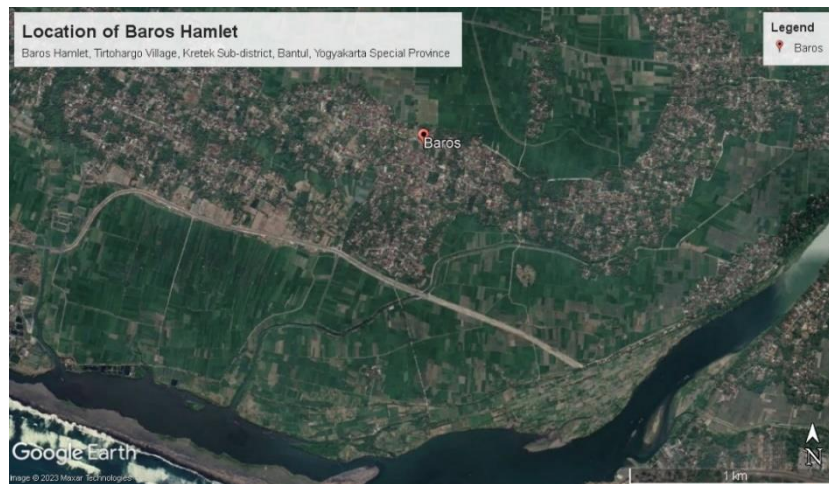


Figure 1. Location of Baros Hamlet

The object of this study consists of actor, location and activities of the community. The activities study accomplished in 4 months, started from December 2018 to March 2019. The study consists of four stages. The first stage was observation. Observation in this study was done in the early one month, meanwhile approach to the community was done long before this study. The next stage was data collection, data processing and analysis. Data collecting process was done in accordance with the parameters of social capital which are consists of norms, trust and social network. Participation is the level of community backup for supporting the mangrove program. The backup exists in many ways. Trust was derived from the openness among members, resource sharing, and the way to cope with the challenges and problems. Social network refers to the relationship between KP2B and the other organizations/stakeholders also refers to the inclusiveness towards changes that occurs.

Data was collected over observation, in-depth interview, documentation and data triangulation. The samples were taken by purposive method with KP2B head of conservation section and its members as the sample. Data triangulation is one of the data collecting technique also serve as data reliability test (Sugiyono, 2009). Data that has been collected, then analyzed using data analysis which is consist of data reduction, data representation and conclusion. In data reduction, many data were filtered accordingly based on the conformity with the aims of this study. The information derived from the data, then represented descriptively and enhanced with the aid of infographic which show the interaction among the parameters in this study in order to give a simple and easy way to understand the condition.

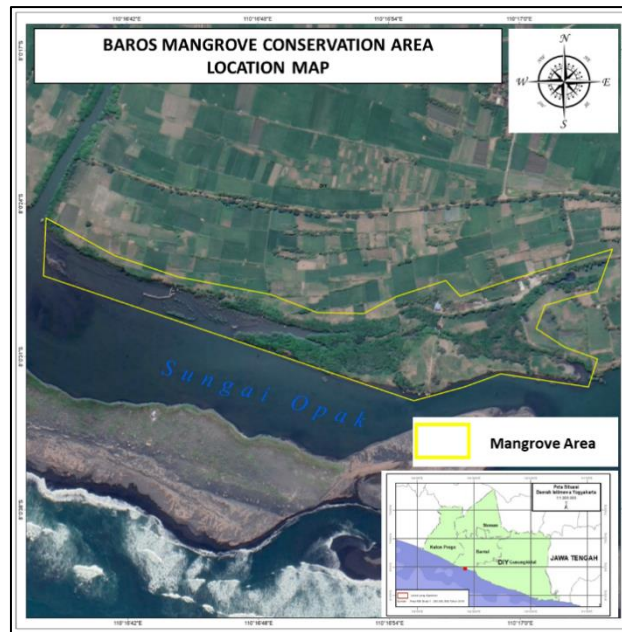


Figure 2. Baros Mangrove Conservation Area

Result and Discussion

Social Capital in Management of Baros Mangrove Conservation Area

Putnam (as cited in Siisiäinen, 2000) provides concepts related to social capital that include three things, namely beliefs, social norms and the third is social networks. In this study, researchers tried to identify the role of community social capital in managing the Baros Mangrove conservation area. Mangrove conservation area in Baros Beach is one of the protected areas on the coast of Bantul Regency. This area began to be conserved since 2003 by the local community through KP2B (Baros Youth Group) together with Relung NGO.

KP2B is a youth organization of Baros Hamlet, one of which has a concentration in the environment. KP2B members number 40 youth and members are young people who have entered the age of High School. KP2B which is a youth organization not only focuses on the management of the Baros Mangrove Area, but also has a focus on other community social activities. In one of its fields, KP2B organization has a conservation field that focuses on Baros mangrove conservation activities which distinguishes it from other youth organizations. The organization changes leadership once three years. The field of conservation has a concentration in the management of the Baros Mangrove Forest Area. In its management, they conduct breeding activities, planting and care of mangrove plants. Breeding activities are still carried out traditionally. Mangrove planting activities are not only carried out by them. They also facilitate the second party to carry out mangrove planting activities and even they have mangrove seed planting packages to be planted in the Baros Mangrove Forest Area. Along with increasing public interest in conservation of the environment, the Baros Mangrove area becomes one of the most widely targeted areas as a conservation area in Daerah Istimewa Yogyakarta (DIY). Nevertheless, the demand for seedlings in large quantities has not been met. This is inseparable from the breeding process that is still done manually.

Community participation in the management of this area is indicated by mangrove planting activities initiated by the local community. This activity increases the capacity and capability of the coastal community and also building strong coastal community (Khakhim et al., 2019) . The following presented data on mangrove planting activities carried out with several parties in Table 1.

No	Parties	No	Parties
1	UST	23	SMA Bintang Mulia Bandung
2	UGM Fakultas Perikanan	24	JMKI Yogyakarta
3	Rumah Zakar Yogyakarta	25	UGM Fakultas Kehutanan

4	University Of Michigan U.S.A	26	SD Muh. Klitren
5	SMK 1 Bantul	27	SD Muh. Kota Gedhe
6	PMI Kabupaten Bantul	28	MMJ, BMP, KP2
7	UNY	29	MAPALA USD Yogyakarta
8	AA YKPN	30	GARDENA
9	SMP Tumbuh	31	.SMA 1 Sanden
10	UPN Veteran	32	DKP Purbolinggo
11	UMY	33	SMP Tumbuh Yogyakarta
12	UAD	34	UNY Fakultas Pendidikan
13	USD Fakultas Biologi	35	UNY Fakultas Bahasa dan Seni
14	SMA BIAS Yogyakarta	36	SMA Teladan Yogyakarta
15	UGM Fakultas Hukum	37	DKP Cilacap
16	UGM Fakultas Ekonomi Bisnis	38	UKDW Bioteknologi
17	Karang Taruna Kab. Bantul	39	SMP IT Arraihan Bantul
18	IST AKPRIND	40	SD Jogja Montessori School
19	UGM Geografi	41	UPN Yogyakarta
20	UNY Fakultas Otomotif	42	MAPALA STIE
21	INTAN	43	Hotel Horison
22	MIC Instiper	44	SD Tumbuh

Sumber : Baros Youth Group, 2017

The management of conservation areas initiated by local institutions shows that this institution is very active and able to conduct conservation of mangrove plants in Baros. Their activities have been able to invite other institutions to participate in Baros mangrove conservation activities. The number of parties participating in mangrove conservation also has an economic impact for the group as well as for the people of Baros. Through KP2B institutions, mangrove conservation process is very well organized. Ostrom (as cited in Fidelman et al., 2017) institution is a formal system that is able to limit and determine one's choices, institutions also become social norms that determine people's behavior. Institutional is considered capable of being an attribute and able to respond to changes that occur in social and environmental conditions. KP2B institutions are considered able to encourage youth in Baros to be more active in the management of conservation areas.

Norms

The norms underlying a person's participation to join KP2B are already binding and accepted by all levels of society. Youth who have entered the secondary education level will consciously join KP2B without any compulsion. Those who join will be determined by the core members will enter the existing field according to their interests and abilities.

The management of mangrove conservation areas is based on the rule of law and applicable norms. The rule of law that is the basis in the management of this area is guided by the Decision of the Regent of Bantul No. 284 of 2014 on the Backup of Coastal Park Conservation Areas in Bantul Regency. The rule contains provisions for the management of turtle Patihan and Mangrove Baros conservation areas in Bantul Regency. In addition to the rule of law in 2019, they hold norms that must be adhered to when entering mangrove forest areas as follows:

1. Courtesy in Mangrove Forest Area
2. Must not shout / crowded during planting activities
3. One-on-one road/queue
4. Must not step on the grass and only allowed to pass through the footpath
5. Must not cut down mangrove trees
6. Must not litter
7. Must not carry /take anything from mangrove forest areas

Many interested parties in the Baros Mangrove Area. Based on the identification of the existence of other actors, it is known that there are many groups of people who have interests (Table 2). The Baros Mangrove Area located at the mouth of the Opak-Oyo River, makes this area flooded with garbage from land and sea, especially in the rainy season. This marine debris has the potential to enter mangrove areas. There are collection groups and groups of marine waste processors. Marine garbage collection groups collect marine waste such as seaweed and glass bottles. While the marine waste processing group, until now still focused on processing marine wood waste into crafts. The problem of marine waste is a problem in itself because they have not succeeded in processing plastic waste from the sea. Marine waste also affected the growth of mangroves on Baros Beach (Jati & Pribadi, 2017).

Table 2. Stakeholder Mapping

No	Stakeholder	Role/interest
1.	KP2B/ Baros Youth Group	Mengelola kawasan konservasi Baros
2.	Coastal waste processing group	Processing coastal waste, namely drift wood become craft
3.	Farmer	Farming
4.	Fisherman	Fishing
5.	Women farmer group	Farming
6.	Breeders group	Breeding
7.	Coastal waste collecting group	Collecting coastal waste
8.	Local tourism management group	Managing local tourism
9.	Bantul Regency Government	Policy makers in the management of conservation areas
10.	Yogyakarta Province Government	Policy makers in the management of conservation areas

Source: Primary data, 2019

The norms in society encourage them to respect each other and not disturb each other, even mutually beneficial. Against the division of roles between parties so as to minimize the occurrence of conflict. The existence of garbage collection groups greatly helps the conservation process carried out in this area. Although, the garbage collected is wood waste and glass garbage.

Trust

Fukuyama (as cited in Saptutyingsih et al., 2019) defines trust based on norms that arise in the community in the hope of bringing about an orderly, honest and cooperative behavior. In KP2B membership, the chairman and members have a positive relationship. More senior members will teach more junior members in managing this Mangrove conservation area. However, the disclosure of information is not fully provided to all members. There are strategies used to provide information to members. For some information is sometimes only known by the core administrator. However, for important information, all information will be conveyed to members. At the time of the mangrove seed planting process, not all KP2B members get the task. Before the implementation of the activity, the chairman will convey to the members, whoever can serve, there is no strict division of duties, the most important thing is in every planting activity carried out there are responsible and some are willing to serve. The chairman does not force members. The absence of task sharing and scheduling indicates a high level of trust of the chairman to members and vice versa. Likewise with their members will voluntarily join if there are no other activities to be done. The level of trust in charge of the activity, is very high in the members who will serve. The person in charge takes a very big risk in the absence of determination of the members who must serve. Trust in members poses a great risk if at the time of the implementation of activities, there are no members on duty. Schecter (as cited in Paul et al., 2016) also reveals the same thing that trust in others can carry risks to what will happen, trust related to a person's tolerance to risk.

Social Network

The sustainability of the conservation of the Baros Mangrove area is inseparable from the support of other parties who also play a role in mangrove planting activities. The success of the activities carried out by the group encourages the other parties to participate in the action. This condition also indicates that the other party's level of trust in the group is very high. They are able to maintain trust by organizing mangrove planting activities well.

The concern of others for the environment is increasingly shown by enthusiasm / interest in planting mangrove seedlings. KP2B is also able to understand that many interested communities in the Baros Mangrove Area, there is a division of roles so as to avoid conflicts of interest.

Conclusion

Community-based conservation area management carried out in the Baros mangrove conservation area has been going well and is able to maintain the existence of mangrove ecosystems. They form an institution in their management. Success in regional management cannot be separated from the social capital owned, namely while maintaining norms, maintaining trust and networking owned

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References

- Ambinari, M., Darusman, D., Alikodra, H. S., & Santoso, N. (2015). Community-Based Mangrove Management : The Relationship between Perhutani and Cultivators in Muara Gembong , Bekasi Regency , West Java Province. *International Journal of Sciences: Basic and Applied Research (IJSBAR)*, 23(2), 204–214.
- Bouma, J., Bulte, E., & Soest, D. Van. (2008). Trust and cooperation : Social capital and community resource management. *Journal of Environmental Economics and Management*, 56, 155–166. <https://doi.org/10.1016/j.jeem.2008.03.004>
- Cleland, J. (2013). World Population Growth; Past, Present and Future. *Environmental and Resource Economics*, 55(4), 543–554. <https://doi.org/10.1007/s10640-013-9675-6>
- Delgado-Serrano, M. del M., Mistry, J., Matzdorf, B., & Leclerc, G. (2017). Community-based management of environmental challenges in Latin America and the Caribbean. *Ecology and Society*, 22(1). <https://doi.org/10.5751/ES-08924-220104>
- Fidelman, P., Van Tuyen, T., Nong, K., & Nursey-Bray, M. (2017). The institutions-adaptive capacity nexus: Insights from coastal resources co-management in Cambodia and Vietnam. *Environmental Science and Policy*, 76(July 2016), 103–112. <https://doi.org/10.1016/j.envsci.2017.06.018>
- Guria, N., & Sinha, M. K. (2015). Population Growth and its Effects on Environment : A Case Study of Bilaspur City (C . G). *Vindhyan Jurnal*, 11, 57–63.
- Jati, I. W., & Pribadi, R. (2017). Penanaman Mangrove Tersistem sebagai Solusi Penambahan Luas Tutupan Lahan Hutan Mangrove Baros di Pesisir Pantai Selatan Kabupaten Bantul. *Proceeding Biology Education Conference*, 14(1), 148–153.
- Khakhim, N., Marfai, M. A., Wicaksono, A., Lazuardi, W., Isnaen, Z., & Walinono, T. (2019). Mangrove ecosystem data inventory using unmanned aerial vehicles (UAVs) in Yogyakarta coastal area. In S. B. Wibowo & A. B. Rimba (Eds.), *Proceeding of Sixth Geoinformation Science Symposium on 30 November 2019* (Issues 11311, 113110M). <https://doi.org/10.1117/12.2547326>
- Mina, R. (2016). DESENTRALISASI PERLINDUNGAN DAN PENGELOLAAN LINGKUNGAN HIDUP SEBAGAI ALTERNATIF MENYELESAIKAN PERMASALAHAN LINGKUNGAN HIDUP. *Arena Hukum*, 9(2), 149–165. <https://doi.org/DOI: http://dx.doi.org/10.21776/ub.arenahukum.2016.00902.1>
- Musavengane, R., & Simatele, D. M. (2016). Community-based natural resource management: The role of social capital in collaborative environmental management of tribal resources in KwaZulu-Natal, South Africa. *Development Southern Africa*, 33(6), 806–821. <https://doi.org/10.1080/0376835X.2016.1231054>
- Paul, C. J., Weinthal, E. S., Bellemare, M. F., & Jeuland, M. A. (2016). Social capital , trust , and adaptation to

- climate change : Evidence from rural Ethiopia. *Global Environmental Change*, 36, 124–138.
<https://doi.org/10.1016/j.gloenvcha.2015.12.003>
- Pulhin, J. M., Gevana, D. T., & Pulhin, F. B. (2017). *Participatory Mangrove Management in a Changing Climate. Perspectives from the Asia-Pacific* (R. DasGupta & R. Shaw (eds.); pp. 247–262). Springer Japan.
<https://doi.org/10.1007/978-4-431-56481-2>
- Raju, J. D. (2004). Social Capital and Poverty of the Wage-Labour Class: Problems with the Social Capital Theory. *Transactions of the Institute of British Geographers*, 29(1), 27–45.
- Saptutyningsih, E., Diswandi, D., & Jaung, W. (2019). Land Use Policy Does social capital matter in climate change adaptation ? A lesson from agricultural sector in Yogyakarta , Indonesia. *Land Use Policy*, September 2018, 104189. <https://doi.org/10.1016/j.landusepol.2019.104189>
- Siisiäinen, M. (2000). Two Concepts of Social Capital : Bourdieu vs . Putnam Department of Social Sciences and University of Jyväskylä Paper presented at ISTR Fourth International Conference " The Third Sec. *ISTR Fourth International Conference "The Third Sector: For What and for Whom?, July.*
- Sugiyono. (2009). *Metode Penelitian Kuantitatif Kualitatif dan R&D*. Alfabeta.
- Torabi, N., Cooke, B., & Bekessy, S. A. (2016). The Role of Social Networks and Trusted Peers in Promoting Biodiverse Carbon Plantings. *Australian Geographer*, 47(2), 139–156.
<https://doi.org/10.1080/00049182.2016.1154535>
- Weber, H., & Sciubba, J. D. (2018). The Effect of Population Growth on the Environment: Evidence from European Regions. *European Journal of Population*, 1–24. <https://doi.org/10.1007/s10680-018-9486-0>
- Wijayanti, D. R., & Suryani, S. (2015). Waste Bank as Community-based Environmental Governance: A Lesson Learned from Surabaya. *Procedia - Social and Behavioral Sciences*, 184(August 2014), 171–179.
<https://doi.org/10.1016/j.sbspro.2015.05.077>
- Woolcock, M. (1998). *Social capital and economic development : Toward a theoretical synthesis and policy framework*. 151–208.