Social capital of local communities in the water resources management: an insight from Kepulauan Riau

W E Yudiatmaja1,*, Yudithia2, T Samnuzulsari3, Suyito4 and Edison5

1 Department of Public Administration, Faculty of Social and Political Sciences, Universitas Maritim Raja Ali Haji, Jl. Raya Dompak Tanjungpinang, Kepulauan Riau 29111, Indonesia
2 Secretary Office of the Regional House of Representatives of Kepulauan Riau, Pulau Dompak, Tanjungpinang, Kepulauan Riau, Indonesia
3 Department of Sociology, Faculty of Social and Political Sciences, Universitas Maritim Raja Ali Haji, Jl. Raya Dompak Tanjungpinang, Kepulauan Riau 29111, Indonesia
4 Department of Sociology, Sekolah Tinggi Ilmu Sosial dan Politik (Stisipol) Raja Haji, Jl. Raja Haji Fisabilillah No. 48 Tanjungpinang, Kepulauan Riau 29122, Indonesia
5 Department of Public Administration, Faculty of Social and Political Sciences, Universitas Maritim Raja Ali Haji, Jl. Raya Dompak Tanjungpinang, Kepulauan Riau 29111, Indonesia

* Corresponding author: wayuguci@umrah.ac.id

Abstract. This paper draws the process of water resources management of local communities by using the social capital point of view. By using a comparative case study, this research was conducted in two regions in Kepulauan Riau, Senggarang and Mantang. Social capital of local communities, such as norms, trust, beliefs, and gotong-royong play a significant role in the process of governing water resources in different ways. This paper contributes to the study of water resources management by recognizing the social capital of local communities. In practical terms, this study is also valuable to the practice of water resources management in the local context in Indonesia. The theoretical, methodological, and practical implications of the study are discussed.

1. Introduction
Water has become a pivotal need in all communities around the world. Because of common interest, water has been considered as a strategic product to be sell. As long as the development of capitalism, water has transformed to be privatised by the multinational corporation, such as Aqua, Danone, and Nestle [1]. They have captured clean water resources in many places, including in Indonesia. In their hands, water has been modified as an economic entity profitable in a global market. However, in several areas in the globe, water is not only placed as commercial goods, but also social commodity maintained and preserved continuously by the local people. They culturally manage the water originated from natural resources in such a region steadily. It is oriented to the shared values, for instance, norms, beliefs, and self-regulation. The results are considerably used for the general interest of the community.

Indonesia is the country with a large number of ethnic diversities. Every ethnic community has a unique social capital contributed to the practice of communal life [2, 3], including natural resources. In Kepulauan Riau, there are ethnic communities participated in managing water resources. The
community-based water resources management is more successful than government provision. It is because of the role of the social capital of the community participated in the governing process of water resources. Because of including in poor of clean water availability, the society in Kepulauan Riau attempts to maintain water resources collectively. They create the system and management of the water resources through community-based orientation. In the process of governing, it also involves the social capital of the community because it has become imprescriptible of their daily life. One of the water resources managed by the local community in Kepulauan Riau is water resources in Tanjungpinang Kota Subdistrict, Tanjungpinang City, and water resource facilities in Mantang Subdistrict, Bintan Regency. It still preserves by local people until today.

The idea of social capital is widely known in social and political literature because of Bourdieu’s, a French philosopher, works. Bourdieu defined social capital as the aggregation of the actual or potential resources related to the possession of a long-lasting network of more or less institutionalised interactions of mutual acquaintance and recognition or, in other words, membership of a group providing each of its members with the support of collective capital, a credential entitling them to praise in the numerous senses of the word [4]. Bourdieu’s notion of social capital has been compiled and developed by the next generations, such as Putnam, Coleman, Fukuyama, and Portes. Following Siisiäinen, in sum, there is two streams in understanding social capital. They are the structural and functional perspectives [5]. The structural emphasises the influence of societal structure and environment on a set of norms, values, ideas, and practices of the humankind. On the other hand, the functional lens views social capital as a consequence of the social system.

Numerous scholars have used the framework of social capital in discussing natural resources management [6–8]. Yet, the prior studies have rarely been paid attention to the social capital in the case of water resources management. Moreover, many inquiries on social capital only focus on a single community and fewer means to compare social capital among the local people. Hence, to fill the gap in the recent literature, this paper aims to shed light on the social capital practised by local communities in Tanjungpinang City and Bintan Regency, Kepulauan Riau Province. The objectives of this paper are twofold: (1) to identify the dimension of social capital and to analyse the practical aspects of social capital among two different communities in the process of water resources management, and (2) to compare them with each other.

This paper has three contributions to the study of water resources management, respectively. First, this study enriches the literature on water resources management by adapting the concept of social capital. The previous researchers pay limited attention to utilise the social capital perspective in examining water resources management. Second, prior studies on social capital in natural resources management and water resources management as well as being dominated by single case study research. No prior scholars are employing dual or multiple-case studies and compare them. This study finally discusses the social capital of local communities in Indonesia in the process of water resources management. Through this research, we offer several recommendations to the policymakers in formulating and implementing water resources management based on community involvement.

The rest of the paper presents the methodological issue of the study. It captures the approach, design, collecting the data, and analysing the data. The results of this study are drawn in two case studies: The Chinese community in Senggarang and Malay community in Mantang. The part subsequently is followed by the discussion and implications of the study. Eventually, the conclusion and recommendations for further research are provided in the last section of the paper.

2. Methods
This research was conducted in two areas in Kepulauan Riau: (1) Senggarang urban village, Tanjungpinang Kota Subdistrict, Tanjungpinang City, and (2) Mantang Village, Mantang Subdistrict, Bintan Regency (the location can be seen in Figure 1 and 2). During March and Mei 2018, this study was structured. By implementing a qualitative strategy, this research employed a comparative case study. For two purposes, it was used. Firstly, it can draw the case deeply. Secondly, by using a comparative case study, we delivered several cases of communities’ social capital.
The data in this work consisted of primary and secondary data. The primary data was gathered by interviewing the participants and observing the practices of social capital in Senggarang and Mantang local communities. A series of in-depth interviews were conducted on the management of water resources management, the member, the society, community figures, and officials of the urban village and village government in Senggarang and Mantang. We used a semi-structured interview by utilizing an interview guide. The probing technique was employed to understand the meaning of informants' responds. It was coded by using open coding before the data were analyzed. To observe the participants, we joined with them in the activities, such as meeting and mutual assistance (gotong royong). The secondary data was collected from the government survey and scholarly journals related to the research. The data were analysed by using thematic analysis by grouped the data in specific terms of social capital, for example, networks, norms, regulations, etc.

3. Results and discussion

3.1 Case study 1: Social capital of the Chinese community in Senggarang

The first water resource managed by the local community in Kepulauan Riau discussed in this paper is Senggarang clean water facility. Senggarang is one of the urban villages in Tanjungpinang Kota Subdistrict of Tanjungpinang City. It is located near to the capital city of Tanjungpinang or approximately 24 km from the port of Sri Bintan Pura, a widely acknowledged as formerly city centre of Tanjungpinang. Generally, Tanjungpinang can be drawn as a multi-ethnic town because, in this city, there are diverse ethnic groups, such as Malay, Javanese, Chinese, Batak, and East Nusa Tenggara. The diversity of ethnic groups has established Tanjungpinang as plural and cosmopolitan city in Sumatera. Although Malay has become the largest ethnic group inhabiting this city, there are also other ethnic groups playing an important role in city development. In their societal life, Tanjungpinang’s society remarkably maintains harmony in diversity.

According to the data of the Regional Bureau of Statistics of Tanjungpinang, the total of the Senggarang population is around 3.194 persons in which 222 individuals inhabit each of one km$^2$ of this area. From the amount, it is predicted that over 40 per cent of the population is Chinese, circa 50 per cent is Malay, and 10 per cent is other ethnic groups. The Chinese community is believed to have existed for a long period in this place. They have incorporated with local people in Tanjungpinang. Throughout our observations, the local people and the Chinese community can live together peacefully. All participants also revealed that they could wisely accept the difference.

| Urban Village    | Wide of Area (Km$^2$) | Population | Population Density (Person/Km$^2$) |
|------------------|-----------------------|------------|-----------------------------------|
| Tanjungpinang Kota | 0.64                  | 5.079      | 7.936                             |
| Penyengat        | 1.11                  | 2.275      | 2.050                             |
| Kampung Bugis    | 23.56                 | 7.175      | 305                               |

Figure 1. The Map of Senggarang
(Created with google maps, 09/12/2019)

Figure 2. The Map of Mantang
(Created with google maps, 09/12/2019)
In Senggarang, there is a clean water facility established in 2002 by the Chinese community. The Chinese people attempted to address a drought issue in Senggarang, especially in the dry season. It was built by digging the soil to be a pool covering an area of 100 square meters. By using a hundred meters pipe, the water is streamed automatically to the people’s homes. Because the source is in a high location, the water can flow by itself without using a machine. The water not only benefited the Chinese people but also all ethnic groups in Senggarang. Klenteng Senggarang Foundation leads the operationalization of the facility. The foundation also handles a worship place of Chinese people in Senggarang, which is Vihara Sasana Dharma. In other words, the foundation takes place as not only a social role but also a religious function. It has been existed along with the existence of the Vihara. Although the government has built a clean water facility in Senggarang in 2015, Klenteng Senggarang Foundation still preserves and operates its clean water facility. In the recent development, the government’s clean water facility cannot be performed successfully because it is not supported by the Senggarang people.

Klenteng Senggarang Foundation operates the facility autonomously. Every month they obtain from the individuals in Senggarang retribution of Rp.50,000,-/home. It is used for water plant maintenance. Interestingly, the foundation does not force the resident who is unable to pay the retribution. To keep the water clean, the Klenteng Senggarang Foundation frequently clean up the pool without any further assistance from another ethnic group. The people believe in the foundation to manage the water resources.

3.2 Case study 2: Social capital of the Malay communities in Mantang

The second case study is water resources governed by the Malay community at the Mantang Lama village, Mantang Subdistrict, Bintan Regency, Kepulauan Riau. The clean water installation is situated in Dusun (sub-village) Mantang Lama and Mantang Riau. The population of Mantang Lama is 930 persons by which the majority of them (almost 90 per cent) is the Malay ethnic group. They began to establish a clean water facility in 2007. For the first time, the development of a clean water pool is assisted by the Ministry of Public Works of the Republic of Indonesia. However, then it was turned over to the Mantang society. Currently, the freshwater facility is led by the residents in Dusun Mantang Lama and Mantang Riau. In contrast to Dusun Mantang Riau, the clean water facility in
Dusun Mantang Lama is managed by the village government of Mantang Lama. The citizens of Mantang Riau would not like to join with Mantang Lama because they do not believe with the village government.

Table 2. Demographic Conditions of Mantang Subdistrict of Bintan Regency (2017)

| Village     | Wide of Area (Km²) | Population | Population Density (Person/Km²) |
|-------------|--------------------|------------|---------------------------------|
| Mantang Lama| 37                 | 930        | 25                              |
| Mantang Besar| 48              | 1,400      | 29                              |
| Mantang Baru| 11                | 1,007      | 91                              |
| Dendun      | 18                 | 1,062      | 59                              |
| **Total**   | **114**            | **4,399**  | **38**                          |

Source: [10]

The governance of water resources in these two places is typically similar. The management comes from the inhabitants chosen through the citizen’s discussion (*musyawarah warga*). The responsibility of the administration is to ensure the availability of the water to the people in the region. The management has the mandate to collect retribution to the people. The tariff is not similar in every Dusun. If Dusun Mantang Lama assigns that the vengeance is Rp.30,000/month, Dusun Mantang Riau only inserts Rp.20,000/month. It is not the same with the Senggarang community not burdening the people with the tariff, in which in Mantang the people who cannot pay the retribution, their water facility will be withdrawn. To clean the pool, the citizens in each region always conduct mutual assistance (in Indonesia called with *gotong-royong*).

3.3 Discussion

The findings of this study go beyond prior research, indicating that the features of social capital merely limited to the network, trust, and beliefs. This study finds a new feature of social capital, typically Indonesia, which is gotong-royong. As explained above, both in Senggarang and Mantang, the local community has practised gotong-royong in governing water resources. Similar findings are also reached by Hanani and Bowen, concluding that gotong-royong in the form of social capital of Indonesian local community influencing the social cohesion and development process [11–13]. However, gotong-royong still limited to the same ethnic groups. For instance, in Senggarang gotong-royong has not involved other ethnic groups in the region whereas the clean water facility is used for all people.

Our results also show that there are many institutional issues faced by the community in managing water resources management, involving technical and non-technical problems. Dusun Mantang Lama's management of clean water is restricted to the maintenance of water suction machines because several of the necessary spare components are only accessible in the stores in the large cities in Java, such as Jakarta and Surabaya. This situation created huge expenses for both groups and a long time for a broken machine to be repaired. Water resources management practised by the groups is still managed by an unofficial system, the group name, structure, standard operating procedure (SOP), and a definite organisational unit are not yet available. Communities couldn't achieve effective, efficient, and responsible, clean water management. This is demonstrated by the absence of leadership abilities in conducting clean water management operations, uncertain organisational hierarchy, lousy knowledge of financial literacy, lack of comprehension and synchronisation of village asset management with village income, the weak capacity to manage conflicts, and inadequate ability to use contemporary technology to assist governing procedures. There are several administrative barriers, including restricted expertise in managing operations, reporting, and using the web to support management.
We analyse the difference of social capital between the Senggarang and Mantang community by using four indicators, such as trust, membership, norms of reciprocity, and network resources. Table 3 summarises the difference. In Senggarang, trust is culturally formed between Chinese and other ethnic groups, although the Chinese community performs the management of a clean water facility. However, in Mantang, it has been pushed by the economic factor. It is because of the relation between the management and the society more contractual. The society has to pay some money as compensation for the use of clean water. The membership of the community occurring in Senggarang tends to more voluntaristic than obliged because no specific norms are regulating the common interest. On the contrary, in Mantang the society is bounded by a regulation, thereby they are more obliged. The result shows that reciprocal norms in Mantang are higher than Senggarang because the relationship constitutes among the same ethnic group. Senggarang community has high network resources than Mantang people because Chinese group in Senggarang can cooperate with other Chinese communities in Tanjungpinang to obtain their need in managing water facilities.

| Dimension               | Senggarang community | Mantang community |
|-------------------------|----------------------|-------------------|
| Trust                   | Culturally established| Economically established |
| Membership              | Voluntaristic        | Obliged           |
| Norms of reciprocity    | Low                  | High              |
| Network resources        | High                 | Low               |

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**Table 3. The Difference of Social Capital Dimensions among Communities**
3.4 Theoretical, methodological, and practical implications

This study complements the research on water resources management in three categories involving theoretical, methodological, and practical features. By providing gotong-royong as social capital, this study has extended the concept of social capital. Besides, from the evidence, we argue that the concept of social capital should be strengthened with an institutionalist perspective. We can combine the notion of social capital with the institutionalism view, as suggested by Ostrom [14]. In methodological terms, this study strengthens the previous works on social capital using a qualitative approach. Finally, this study can be considered by the local government in designing water resources management in the local community. The government should prepare positive social capital and environment before implementing water resources management policy based on community governance.

4. Conclusion

In this paper, we analyse the social capital of local communities in governing water resources at two different regions in Kepulauan Riau. In summary, we argue that the different patterns of social capital established because of the distinguish of socio-cultural backgrounds of the community. Besides, social capital, including norms, networks, values, togetherness, and mutual assistance (gotong-royong) plays a crucial role in determining the process of water resources management. The institutional problem can inhibit the achievement of common management in long terms if the issues cannot be addressed soon. These results contribute to add our understanding of the water resources management by considering the social capital of the community. It is worthwhile to the decision-maker in Indonesian local government focussing on the issue of water resources as well as to design the effective implementation of water resources management through the recognition of local communities’ social capital.

This study is not spared from several limitations, and thereby we are responsible for revealing it. These limitations are apparent in three respect. First, our study focuses on the social capital of the community. The community in two regions is the unit analysis of the study. Further works should consider the links between people across different organisations (cross-cutting ties) [15]. Second, we have used qualitative and case study research to reach some conclusion in this paper. The utilisation of qualitative research can extensively analyse the case. However, it cannot be a generalisation basis for the strengthening of our arguments.

Consequently, the next studied can adopt quantitative [16] or mixed-methods (quantitative and qualitative simultaneously). Third, this study has not considered gender viewpoint in investigating the social capital of the community. It tends to assume that gender is not a significant part of forming social capital. Therefore, further research should look into the gender aspect in the process of water resources management [17].

References

[1] N. Heynen and P. Robbins, “The neoliberalization of nature: Governance, privatization, enclosure and valuation,” Capitalism Nature Socialism, vol. 16, no. 1, pp. 5–8, 2005.
[2] P. Barron, K. Kaiser, and M. Pradhan, “Understanding variations in local conflict: Evidence and implications from Indonesia,” World Development, vol. 37, no. 3, pp. 698–713, 2009.
[3] D. Mavridis, “Ethnic diversity and social capital in Indonesia,” World Development, vol. 67, pp. 376–395, 2015.
[4] P. Bourdieu, “The forms of capital,” in Handbook of theory and research for the sociology of education, J. G. Richardson, Ed., New York: Greenwood Press, 1986, pp. 241–258.
[5] M. Sisiiäinen, “One concept, two approaches: Bourdieu and Putnam on social capital,” International Journal of Contemporary Sociology, vol. 40, no. 2, pp. 183–204, 2003.
[6] F. Cleaver, “Reinventing institutions: Bricolage and the social embeddedness of natural resource management,” European Journal of Development Research, vol. 14, no. 2, pp. 11–30, 2002.
[7] J. Pretty, “Social capital and the collective management of resources,” Science, vol. 302, no. 5652, pp. 1912–1914, 2003.
[8] T. Claridge, “Social capital and natural resource management: An important role for social capital?,” M.A. Thesis, The University of Queensland, Queensland, 2004.
[9] Regional Bureau of Statistics of Tanjungpinang, *Tanjungpinang Kota Subdistrict in figure 2018*. Tanjungpinang: Regional Bureau of Statistics of Tanjungpinang, 2018.

[10] Regional Bureau of Statistics of Bintan, *Mantang Subdistrict in figure 2018*. Bintan: Regional Bureau of Statistics of Bintan, 2018.

[11] V. A. Beard, “Individual determinants of participation in community development in Indonesia,” *Environment and Planning C: Government and Policy*, vol. 23, no. 1, pp. 21–39, 2005.

[12] S. Hanani, “Studi negosiasi kultural yang mendamaikan antaretnik dan agama di Kota Tanjungpinang [Study on reconciled cultural negotiation inter-ethnics and religion in Tanjungpinang city],” *Epistemé*, vol. 12, no. 1, pp. 201–230, 2017.

[13] J. R. Bowen, “On the political construction of tradition: Gotong Royong in Indonesia,” *Journal of Asian Studies*, vol. 45, no. 3, 545-561, 1986.

[14] E. Ostrom, *Understanding institutional diversity*. Princeton, New Jersey: Princeton University Press, 2005.

[15] P. Paxton, “Is social capital declining in the United States? A multiple indicator assessment,” *American Journal of Sociology*, vol. 105, no. 1, pp. 88–127, 1999.

[16] D. Narayan and M. F. Cassidy, “A dimensional approach to measuring social capital: Development and validation of a social capital inventory,” *Current Sociology*, vol. 49, no. 2, pp. 59–102, 2001.

[17] R. Silvey and R. Elmhirst, “Engendering social capital: Women workers and rural-urban networks in Indonesia’s crisis,” *World Development*, vol. 31, no. 5, pp. 865–879, 2003.