

# Mangrove Conservation Group Management in Semarang City, Central Java, Indonesia

Riki Realita Kurniawan  
Universitas Negeri Semarang,  
Indonesia  
[rikirealita@gmail.com](mailto:rikirealita@gmail.com)

Erni Suharini  
Universitas Negeri Semarang,  
Indonesia  
[erni.suharini@mail.unnes.ac.id](mailto:erni.suharini@mail.unnes.ac.id)

Eva Banowati  
Universitas Negeri Semarang,  
Indonesia  
[evabanowatigeografi@mail.unnes.ac.id](mailto:evabanowatigeografi@mail.unnes.ac.id)

**Abstract**—The damage level of mangrove forest in Semarang City has caused disasters for coastal communities, particularly abrasion and rob. These conditions drive the concern of coastal communities in rehabilitating mangroves via mangrove conservation groups. There are four mangrove conservation groups spread in four coastal districts of Semarang City. This study aims to determine the management of mangrove conservation groups in the coastal of Semarang City. The descriptive qualitative research approach is used to describe the management of mangrove groups as an effort to rehabilitate coastal mangroves in Semarang City. Data collection was carried out through in-depth interviews, observations, and documentation with the mangrove conservation group management. The data analysis model was carried out using three panels: data collection, data reduction, data presentation, and conclusion or verification. The results showed that the management of mangrove groups has an important role in the rehabilitation effort includes the stages of planning, organizing, implementing, and controlling activities. The participation of universities, private parties, and the government is very helpful in the existence of mangrove conservation groups. It can be concluded from the research that the group members have implemented management using Planning, Organizing, Actuating, and Controlling (POAC) principles well.

**Keyword:** management, mangrove communities, rehabilitation

## I. INTRODUCTION

Semarang City is an area on the northern coast of Java. Its coastline stretches approximately 13 kilometres long (Andika et al., 2018). There are four sub-districts in Semarang City bordering the coastal area including Genuk District, North Semarang District, West Semarang District, and Tugu District (BPS, 2019). The condition of Semarang City, which is directly adjacent to the coastal area, creates vulnerability to abrasion, retreating coastlines, flooding/rob, land subsidence, and ecosystem degradation. The increasing sea level in the city causes economic loss amounted to 729 million rupiah per year. It also damages 2,889 hectares of aquaculture area, resulting in economic losses of 100 million rupiah (Fauziah, 2014).

Being aware of the vulnerability of Semarang City coastal area, the coastal community,

universities, government, non-governmental organizations, and the private sectors work together to save the coast (Martuti et al., 2018). One concrete course of action to save the coastal area is forming a mangrove conservation group. The population of mangrove plantations has been suffering from land conversion as the need of land for aquaculture, industry, and housing rises up. By restoring the plants, the risk of disaster happening along the coastal area of Semarang can be reduced.

Encouraging the local community to be actively involved in the restoration effort proves to be the best course of action. It increases not only their awareness of the situation at hand, but also the economic growth of the society in the coastal area (Aheto, et al., 2016). Efforts to restore the presence of mangrove ecosystems in the northern coast of Central Java has been done include making real efforts to preserve mangrove tersistem community-based and structured (Sanjoto, 2015). Managing the natural resources through the community effort in restoring the mangrove will ensure their sustainability (Inayati et al., 2017). The community-based integrated management model in reducing disaster vulnerability will be very optimal as it is in accordance with the needs and capacities of the surrounding community (Suharini & Kurniawan, 2019).

To minimize the damage to the coastal areas, it is essential to build cooperation among the local governments, related agencies, and community (Raharjo et al., 2016). The participation of the coastal community of Semarang in mangrove conservation efforts has been remarkable, as evidenced by the efforts of seeding, planting, handling abrasion, and mangrove education services (Martuti et al., 2018). The results of Roospondanwangi's (2018) study on Bintari communication strategy in mangrove conservation, especially in Tapak Tugurejo Semarang, have been running well, proven by the improvement of Tapak coastal ecosystem condition.

In this research, we will see how mangrove restoration groups in Semarang applies the principles of Planning, Organizing, Actuating, and Controlling (POAC) within their management. This study aims to find out how each mangrove group in Semarang administers the POAC principles into the sustainable management of coastal area in Semarang.

This research will help the managers to detect problems faced by the group and determine the most suitable management system, hence improving the group's ecological, social, and economical aspects.

II. METHODS

Semarang City is an area in the northern coast of Java. The city is bordered by the Java Sea on the north and Semarang Regency on the south. Kendal and Demak Regency border its western and eastern area, respectively.

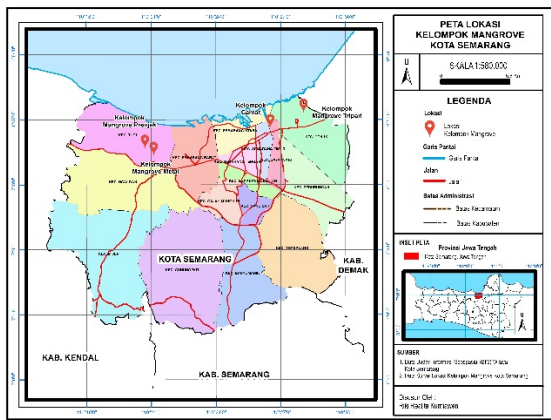


Figure 1. Research Location

Qualitative analysis method was applied in order to achieve thorough understanding of POAC management principal application in managing mangrove restoration group. Qualitative descriptive research is a research conducted in natural conditions, often called the ethnographic method (Sugiono, 2015). Focus group discussion method was employed to learn deeper about the management carried out by each group.

The researcher began the study by digging preliminary information through a field survey. This stage was essential for obtaining the desired research location representing the condition of mangrove conservation group in coastal area of Semarang. Field observation method was applied to record the existence of groups engaged in mangrove conservation activity.

To collect the data, the researcher used the observation method and structured interviews with key informants from each group. The researcher included secondary and primary data in his study. The secondary data consisted of documentation result, literature study on data from each group, and results from the previous research. The primary data was obtained through in-depth interviews with key sources for each mangrove conservation group.

The data gathered in this research was analysed using descriptive qualitative (Miles et.al., 2014). The descriptive qualitative research approach is used to describe the management of mangrove

groups as an effort to rehabilitate coastal mangroves in Semarang City. Data collection was carried out through in-depth interviews, observations, and documentation with the mangrove conservation group management. The data analysis model was carried out using three panels: data collection, data reduction, data presentation, and conclusion or verification. This method was used to find out how the group applies management principles in managing mangrove conservation groups on the coast of Semarang City, which was obtained from various sources such as observation, in-depth interviews, and literature studies.

III. RESULTS AND DISCUSSION

3.1 Semarang City Mangrove Area

Efforts to rehabilitate the coastal area to prevent abrasion, tidal flooding, and land subsidence have been carried out by various parties such as the community, environmental groups, universities, non-governmental organizations (NGOs), private organizations, and the government in Semarang City. This form of concern rises from the people's awareness of the steadily worsening coastal condition. It brings forth economic impacts on the community, such as reduced income, affecting the welfare of families (Akbar et al., 2017). In addition, the steady increase of the sea level forces the residents around the coast to raise the foundation of their house to avoid flooding.



Figure 2. Residents' Houses Affected By Abrasion

People are starting to realize that the decline suffered by mangrove areas has caused several disasters to occur in coastal areas. The mangrove areas in Semarang City are as follows:

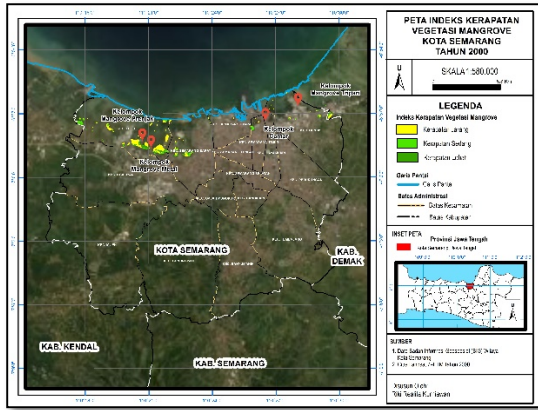


Figure 3. Mangrove Area In 2000

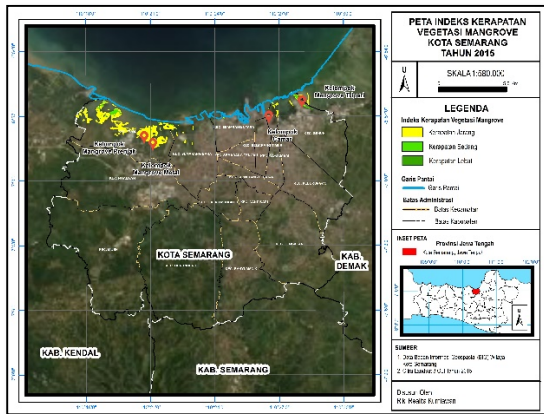


Figure 4. Mangrove Area In 2015

3.2 Semarang City Mangrove Conservation Group

A mangrove conservation group is consisted of coastal residents who are concerned about the damage suffered by the coastal areas. The majority of the group’s members are fishermen, fish farmers, and private workers. Apart from independently rehabilitating mangroves, this group is also supported by the private sector, universities, community support organizations (NGOs) and government agencies. The group focuses on planting, making wave breakers, providing education on the importance of mangroves, and community empowerment.

Tabel 1. Semarang City Mangrove Conservation Group

Group Name	Location	Involvement			
		A	B	P	M L
Camar	Tambakrejo Semarang Utara	√	√	√	√
Metal	Maron, Tugu Semarang	√	√	√	-
Prenjak	Tapak, Tugu Semarang	√	-	√	√
Mangrove Lestari	Mangunharjo, Mangkang	√	√	√	√

Tripari                      Trimulyo,                      √ - √ √ √  
 Genuk

Note: A = Academics; B = Business; P = Government (*Pemerintah*); M = Society (*Masyarakat*); L = NGOs (LSM); (√) = involved; (-) = not involved

Source: Writer’s analysis, 2020

There are several private organizations that participate in Corporate Social Responsibility (CSR) including Pertamina Inc., Phaphros Inc., and Djarum Foundation. There are also several companies in Semarang which contribute to mangroves restoration. The role of non-governmental organizations (NGOs) such as the Bintari Foundation, Mercy Corps Indonesia, and Protect the Forest is also greatly felt by coastal communities in mangrove conservation. Universities in Semarang such as Diponegoro University (UNDIP), Semarang State University (UNNES), and Soegijapranata Catholic University also show their support. The group is also backed by government agencies including the Environmental Service, Marine and Fisheries Service, and Forestry Service.

During the mangrove rehabilitation process, all the parties collaborate with each other according to their roles and responsibilities; Universities provides knowledge, private sectors provides financial supports, government organizations deals in policies, NGOs provides alternative funding and assistance, and the community itself acts as the key actors in the program.

3.3 Mangrove Conservation Group Planning (Planning)

The group planning can be observed from the initiators of conservation group, namely: (1) Prenjak group, initiated by a youth association in 2000, led by Mr. Abdul Roviq; (2) Tripari group, initially a fish farmers association, led by Mr. Sumadi; (3) Camar group, initiated by Mr. Ratno, also a form of CSR from Pertamina Inc.; (4) Metal group, initiated by Phaphros Inc. and Mr. Rosmadi, a fish farmer.

The followings are the backgrounds of each group in establishing mangrove rehabilitation group, namely: (1) Prenjak group saw the pollution in Tapak river due to industrial waste disposal and the damage in aquaculture areas, causing financial problems; (2) Tripari group was motivated by the impact of abrasion on Trimulyo aquaculture areas; (3) Camar group acted based on public’s concern about the damage brought by abrasion in Tambakrejo area, the majority of aquaculture areas are gone, the abrasion almost reaches the community’s residence; (4) Metal group saw that the fish farming’s yield continued to decline due to channel narrowing and the threat of abrasion to their their ponds.

Broadly speaking, the reason for the establishment of this mangrove conservation group is to protect the coastal areas they live in so that they do not suffer damage due to pollution, abrasion, and land

subsidence. Supports from several parties such as universities and academics have further strengthened the role and existence of mangrove conservation groups.

### 3.4 Mangrove Conservation Group Organizing (Organizing)

Proper organizing will greatly affect the course and sustainability of mangrove conservation groups. All mangrove conservation groups have a clear organizational structure starting from the Protector, Advisor, Chairperson, Deputy Chairperson, Treasurer, Secretariat and various sections according to the members' need. Members of the mangrove conservation group believe that the assistance from the university provides the knowledge for good organization system. The members who did not experience proper educational experience find the university's role beneficial.

The mangrove conservation group's program, from nurseries to planting and monitoring, has been running well. There are several other programs that are also carried out in each group, namely: (1) Prenjak group focuses not only on the mangrove rehabilitation program, but also on the member's educational improvement by providing several scholarships in order to improve their life quality; (2) Camar group encourages their members to lower their dependency level on marine products and start to consider giving educational tours to the tourists as their source of living, hence the various training programs such as screen painting, crafts making, and food processing; (3) Metal group focuses on processing mangrove plants into food such as *rempeyek*, syrup, and jam to increase farmers' income.

There are several obstacles experienced by the members after receiving the training, especially in terms of tools availability and marketing. Because of that, the members are unable to continue the production process which would increase their income.

### 3.5 Mangrove Conservation Group Activity Implementation (Actuating)

The implementation of activities, especially the routine meetings of each group, has certain characteristics as follows: (1) Prenjak group conducts routine meetings once a month to evaluate monthly activities and annual meetings to evaluate annual activities. Apart from that, the group also holds meetings in preparation for every planting activity. The members take turns in providing the meeting place; (2) Tripari group used to hold regular monthly meeting in the first six months of the formation of the group, but currently the meetings are only held before the nursery and planting; (3) Camar group has a monthly meeting time. Besides that, because the members' houses are close to each other, every time there is important matter to be discussed, they will gather at Camar secretariat; (3) Metal group routinely

holds monthly meetings which take place at the group's secretariat.

The financial sources for mangrove rehabilitation activities of each group are as follows: (1) Prenjak group's funding comes from the parties who buy mangrove seedlings. Since the group's establishment in 2000, the group has benefited a lot from it; (2) Tripari group's funding comes from parties who buy mangrove seeds to be planted; (3) Camar group's funding comes from parties who buy mangrove seeds and CSR funding from Pertamina Inc.; (4) Metal group's funding comes from Phapros Inc.'s CSR and seed purchases.

Government involvements are apparent in several mangrove conservation groups, such as providing conservation training and comparative studies to several successful mangrove conservation groups, granting deeds of establishment of groups, and supporting planting activities. To protect the community-based mangrove environment, the government formed Semarang City Mangrove Working Group (KKMKS) based on the Semarang Mayor's Certificate Number 0504/466 dated December 22, 2010.

### 3.6 Mangrove Conservation Group Control (Controlling)

The activities of the mangrove conservation group are controlled by the government, such as the environmental office, the urban village, CSR providers, and the group advisors. The group is also monitored and evaluated once a year by the group's own members and by the CSR party.

In recruiting their members, all groups do not put forward any requirement; anyone can join. A lot of Prenjak group's members joined in when they were still 12 years old. Tripari group used to be dominated by fish farmers. Nowadays, as the number of the ponds decreases gradually, most of the group members are factory workers.

### 3.7 Problems Faced in Organizing Mangrove Conservation Groups

The problems faced by mangrove conservation groups in Semarang are as follows: (1) Prenjak group's reorganization did not go well, resulting in temporary suspension of membership, and the group's assets are poorly organized; (2) Tripari group finds difficulties in adding the mangrove plantation area as it is heavily exposed to abrasion, resulting in the reduction of mangrove planting activity; (3) Camar group is having a hard time in encouraging the younger generations in Tambakrejo to be involved in mangrove rehabilitation activities; (4) Metal group faces difficulty in finding new mangrove planting area ever since their old area was closed due to A.Yani Airport's expansion. Furthermore, their members are lacking especially in education.

#### IV. CONCLUSION

Based on this study, it can be concluded that the mangrove conservation group in Semarang City has succeeded in restoring the mangrove area. The management applied in group organizing has implemented the principles of Planning, Organizing, Actuating, and Controlling (POAC). In general, group planning begins with growing public awareness of the importance of mangroves. At the organizing stage, it has been going mostly well, the only problem is the lack of participation from the younger generation. In the actuating stage, all mangrove groups have conservation goals that will provide added value to the surrounding community. In the controlling stage, all activities in the mangrove group are evaluated in monthly and yearly periods.

#### REFERENCES

- [1] Aheto, D. W., Kankam, S., Okyere, I., Mensah, E., Osman, A., Jonah, E. F., & Mensah, J. C. (2016). Community-based mangrove forest management: Implications for local livelihoods and coastal resource conservation along the Volta estuary catchment area of Ghana. *Ocean & Coastal Management*, 43-54.
- [2] Akbar, A. A., Sartohadi, J., Djohan, T. S., & Ritohardoyo, S. (2017). Erosi Pantai, Ekosistem Hutan Bakau dan Adaptasi Masyarakat Terhadap Bencana Kerusakan Pantai Di negara Tropis. *Jurnal Ilmu Lingkungan*, 1-10.
- [3] Andika, N. D., Aji, A., & Sanjoto, T. B. (2018). Geo Image (Spatial-Ecological-Regional) Analisis Kerentanan Pesisir Akibat Kenaikan Muka Air Laut di Kota Semarang. *Geo Image*, 7(1), 78-87.
- [4] Fauziah, A. N. (2014). Kajian Kerentanan Iklim: Sebuah Penilaian Kembali di Wilayah Pesisir Kota Semarang. *Jurnal Pembangunan Wilayah & Kota*, 10(3), 316.
- [5] Herawati, F., Suharini, E., Hayati, R., & Banowati, E. (2018). Pengaruh Perilaku Masyarakat Dalam Menjaga Kebersihan Sungai Tenggang Terhadap Kebersihan Lingkungan di Kelurahan Tambakrejo Kecamatan Gayamsari Kota Semarang. *Seminar Nasional Kolaborasi Pengabdian pada Masyarakat* (pp. 558-562). Semarang: Proceeding SNK-PPM.
- [6] Inayati, D., Suharini, E., & Sriyono. (2017). Tingkat Partispasi Penduduk dalam Upaya Pelestarian Tanaman Mangrove didesa Pecakaran Kabupaten Pekalongan. *Edu Geography*, 5, 18-24.
- [7] Martuti, N. K. T., Susilowati, S. M. E., Sidiq, W. A. B. N., & Mutiatari, D. P. (2018). Peran Kelompok Masyarakat dalam Rehabilitasi Ekosistem Mangrove di Pesisir Kota Semarang. *Jurnal Wilayah dan Lingkungan*, 6(2), 100.
- [8] Miles, M. B., Huberman, A. M., & Saldana, J. (2014). *Qualitative data analysis: A methods sourcebook*. Thousand Oaks, CA: Sage Publishing.
- [9] Sanjoto, T. B. (2015). Typology of Coastal Areas and Effect on Mangrove Vegetation Distribution in The Zone Sediment Cell Between River yo River Comal- Bodri Central Java. 1st UNNES INTERNATIONAL CONFERENCE (pp. 264-269). *Semarang: Research and Community Service Institute Semarang State University*.
- [10] Sugiono. (2015). *Metode Penelitian Kuantitatif Kualitatif dan R&D*. Bandung: CV. Alfabeth.
- [11] Suharini, E., & Kurniawan, E. (2019). Pelatihan Sistem Peringatan Dini Banjir Berbasis Masyarakat Kelurahan Sampangan Kecamatan Gajahmungkur Kota Semarang Guna Mewujudkan Masyarakat Tanggap Bencana. *Jurnal Panjar*, 114-117.