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# The nexus between stakeholders' role, eco-empowerment, and community perceptions on mangrove ecosystem management's sustainability

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**Abstract.** Managing coastal ecosystem resources and mangrove forests in Sayung District, Demak Regency faces many challenges if it does not involve the community's active role and stakeholders. Ecological empowerment faces the abrasion, erosion, and sedimentation of coastal areas that mangrove stands have not covered. On the other hand, the revitalization and rehabilitation program is still not optimal, so it requires the participation of many institutions, not only from the government but also from non-government, so that all management programs run in tandem are integrated and is following regulations. This study aims to determine the relationship between the role of stakeholders, eco-empowerment, and community perceptions of the sustainability of mangrove ecosystem management. The location selection used the purposive method. While the sample selection used the purposive and snowball random sampling methods. Data analysis used the partial least square method. The study's results indicate that the stakeholders' role has a direct positive and significant impact on eco-empowerment and perceptions of sustainability. Eco-empowerment has a direct positive and significant effect on the perception of sustainability. The role of stakeholders has a positive and indirect influence on the perception of sustainability through eco-empowerment activities.

**Keywords:** stakeholders role; eco-empowerment; community perception; ecosystem management; sustainability

## 1. Introduction

The coastal communities of Sayung Subdistrict, Demak Regency, face complex problems, including damage to mangrove and coastal ecosystems, abrasion, erosion, sedimentation, and environmental pollution. For information, Sayung is an area with very high impacts of erosion, abrasion, and sedimentation in the province of Central Java. Community participation and concern that describes the roles and activities in an ecosystem will influence the condition of environmental sustainability.

The mangrove ecosystem has a variety of interrelated components, either directly or indirectly [1]. This linkage must have synergy and balance so everything can run in harmony according to its functions [2]. For example, the destruction of the mangrove ecosystem causes the biodiversity that breeds and



utilizes this biota to experience threats such as reduced plant varieties, types of fish, insects, and other animals [3]. Many community members depend on the diversity of biota found in mangrove areas [4].

Seeing the problems and environmental vulnerabilities in the Sayung mangrove ecosystem, one way to overcome them is by using an approach of empowerment and community participation. Community empowerment can involve mental and emotional influences so that they are willing to preserve the environment actively [5]. Empowerment can encourage concern, a sense of belonging, real action, and changes in pro-environmental behavior/culture [6]. The stakeholders' participation who work with communities in an area gives hope for forming new policies, activities, and innovations to protect the environment [7].

Facing the problems and environmental vulnerabilities that the people of Sayung see and feel, it is necessary to collaborate with stakeholders to improve eco-empowerment. Empowerment is not only carried out by the government but also must be able to encourage the involvement of the private sector, non-government, and the general public [8]. Boosting the role of stakeholders in the sustainability of mangrove ecosystem management in Sayung District, Demak Regency, is fascinating to study. The measuring of community perception becomes a baseline for how community empowerment might inspire changes in the environmental management of mangrove ecosystems [9]. Researchers expect to encourage innovation regarding the study of the role of stakeholders in community empowerment that has a positive impact on ecological aspects, specifically related to the sustainability of mangrove ecosystem management.

## **2. Methodology**

### *2.1. Location and sample determination*

The researcher selected the location using the purposive method in Sayung District. The village sample was selected using the Cluster Sampling method in two villages, Sriwulan and Bedono. Determination of the sample using two methods: purposive and snowball random sampling. Each research village selected 30 people, bringing the total number to 60.

### *2.2. Stakeholder role indicators*

Researchers use five indicators to measure the role of stakeholders, namely: a) Policy creator role. Perceptions of the role of stakeholders as decision and policy creators for mangrove ecosystem management, b) Coordinator's role. Perceptions of the role of stakeholders as empowerment coordinators and other stakeholders who participate, and c) Facilitator's role. The perception of the role of stakeholders [10] in facilitating and meeting the target group's needs; d) Implementer's role. Perceptions of the role of stakeholders in implementing policies which include the target group; and e) Accelerator's role. The perception of stakeholders' role accelerates and contributes to a program's achievement [11].

### *2.3. Eco-empowerment indicators*

The purpose of ecological empowerment in this research is to increase community participation in conservation and rehabilitation efforts and increase the biodiversity of mangrove ecosystems [12]. Then the researchers used three indicators to measure ecological empowerment, namely: a) Increased active community participation in conservation activities [13], b) Increased active participation of the community in rehabilitation activities [14], and c) Increased active participation of the community through environmental clean-up activities [15].

### *2.4. Management sustainability indicators*

Measuring community perceptions related to the mangrove ecosystem management sustainability leads to the impact after empowerment by stakeholders [16]. Then the researchers used four indicators, namely: a) The quality of the mangrove environment is getting better and supports ecological

sustainability [17], b) The biodiversity of mangrove ecosystems is increasing [18], c) Expansion of mangrove areas [19], and d) Reduced abrasion and erosion around mangrove areas [20].

### 3. Result and discussion

The first stage is to evaluate the partial least squares algorithm model, as shown in Figure 1 and Table 1 below:

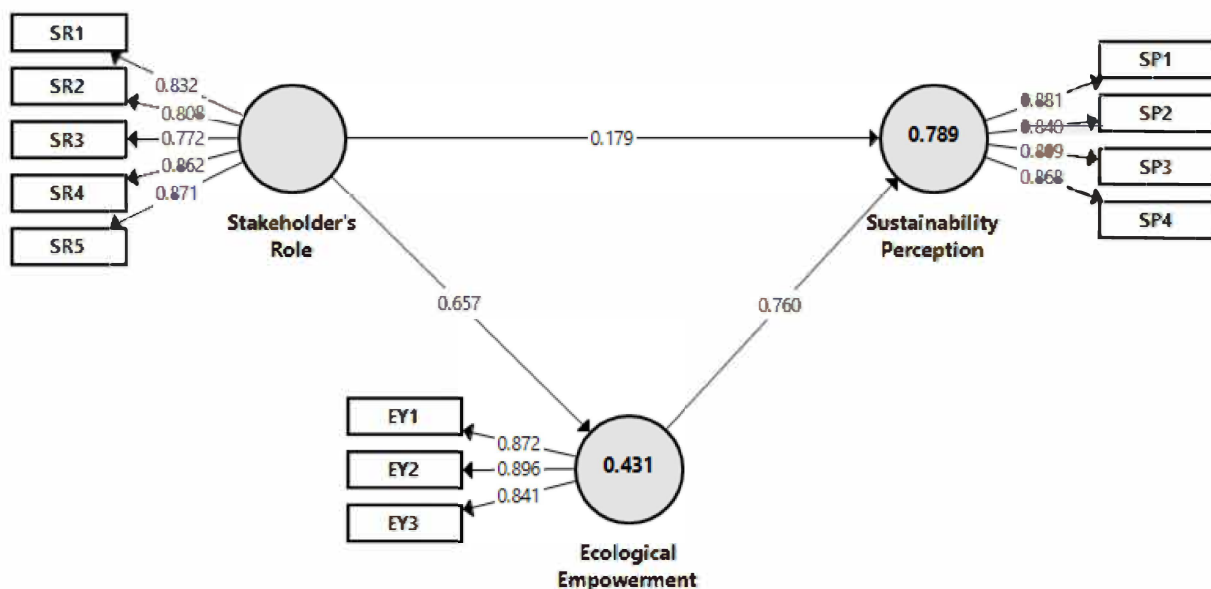


Figure 1. Path model output.

Table 1. Variables, indicator, cross-loading, r square, construct reliability, and validity.

Variable	Indicator	Cross Loading			CA	rho_A	CR	AVE	R <sup>2</sup>
		SR	EY	SP					
<b>Stakeholder's Role (SR)</b>	SR1	<b>0.832</b>	0.542	0.600	<b>0.886</b>	<b>0.887</b>	<b>0.917</b>	<b>0.689</b>	
	SR2	<b>0.808</b>	0.562	0.596					
	SR3	<b>0.772</b>	0.553	0.571					
	SR4	<b>0.862</b>	0.576	0.544					
	SR5	<b>0.871</b>	0.473	0.483					
<b>Ecological Empowerment (EY)</b>	EY1	0.549	<b>0.872</b>	0.691	<b>0.839</b>	<b>0.844</b>	<b>0.903</b>	<b>0.757</b>	<b>0.431</b>
	EY2	0.569	<b>0.896</b>	0.852					
	EY3	0.595	<b>0.841</b>	0.736					
<b>Sustainable Perception (SP)</b>	SP1	0.630	0.748	<b>0.881</b>	<b>0.871</b>	<b>0.872</b>	<b>0.912</b>	<b>0.722</b>	<b>0.789</b>
	SP2	0.505	0.762	<b>0.840</b>					
	SP3	0.559	0.716	<b>0.809</b>					
	SP4	0.611	0.758	<b>0.868</b>					

Source: Data processing

The indicator validity test in this study used a cross-loading limit of 0.7 so that the SR, EY, and SP values passed the validation test. Discriminant validity (DV) aims to test to what extent the latent construct is different from other constructs. A high DV value indicates that a construct was unique and able to explain the phenomenon the researcher is testing. The average variance extract (AVE) value is higher than 0.5, and the correlation value of each latent variable is more significant than its correlation value with other latent variables, indicating that the test data has a valid discriminant. The R<sup>2</sup> value of the SR variable to EY is 0.431 (43.1% moderate category). In comparison, SR and EY, together with

SP of 0.789 (78.9% high category), are overall able to explain the model, while the rest are outside the model.

**Table 2.** The direct-indirect effect path coefficient and hypothesis testing.

Variable	Original Sample (O)	T Statistics	P Values	Sig.
<u>Direct effect</u>				
SR → EY	0.657	8.387	<b>0.000</b>	***
SR → SP	0.179	2.183	<b>0.030</b>	**
EY → SP	0.760	11.303	<b>0.000</b>	***
<u>Indirect effect</u>				
SR → EY → SP	0.499	6.723	<b>0.000</b>	***

Source: Data processing output; Significance level: \*\*\* = 99%; \*\* = 95%; \* = 90%; ns = not significant

### 3.1. Stakeholders' role in eco-empowerment

#### *H1: Stakeholders' role affects eco-empowerment*

Table 2 shows that the SR value positively and significantly influences EY. This result is confirmed by looking at the path coefficient value (original sample estimate) of 0.657 and the significance level of the p-value of 0.000, thus accepting the first hypothesis. Stakeholders' five active roles can encourage community participation around the mangrove ecosystem in preserving the environment. Stakeholders act as facilitators and coordinators related to conservation and rehabilitation activities. They provide training and assistance facilities for mangrove conservation with planting, caring, and monitoring methods. They also develop coordination with partnership patterns to not only plant but also accelerate the growth of mangroves. The community is actively involved in the maintenance process. Treatment aims to ensure the plant roots and stems from the beginning of planting until growth. If the community finds damaged stands during monitoring, the community carries out the treatment by replanting new mangrove seedlings. The government establishes a policy of three zones of mangrove areas, namely: a) preservation zone, b) conservation zones, and c) recreation zone. In implementing the procedures for the three zones, stakeholders elaborate on and accelerate the eco-empowerment program to encourage education and public awareness about the meaning of hope for the future while encouraging ecosystems to become a means of learning environmental sustainability and providing new entrepreneurial opportunities in the tourism sector.

### 3.2. Stakeholders' role in sustainable management perceptions

#### *H2: Stakeholders' role affects sustainable management perceptions*

The value of SR has a positive and significant effect on SP, which is confirmed by looking at the path coefficient value (original sample estimate) of 0.179 and a significant level of the p-value of 0.030, thus accepting the second hypothesis. Stakeholders play the role of facilitator and coordinator of early education activities for mangrove conservation and rehabilitation. The form of activities that target the younger generation to increase environmental awareness from an early age is the goal of this program. Guidance and counseling through debriefing, demonstration of planting, and monitoring of mangrove seedlings encourage the acceleration of increasing perceptions of sustainability. Changing the younger generation's mindset encourages increased responses to positive perceptions of sustainability. The younger generation, who are more open to new ideas and care about the environment, respond to the perception of the importance of mangroves in the long term. The implementation role was not only carried out by the central government through representatives of the Ministry of marine and fisheries and local governments but also the involvement of foreign institutions such as OISCA from Japan, PT Bintraco, PT Kino, PT Arkoff, PT Charoen Phokpand Indonesia, PT TAP, PT Buana Harum Karisma, and PT Coal. Through CSR programs, youth become active in conservation, rehabilitation, and

environmental clean-up efforts, as well as increasing responses regarding ecological sustainability in the future [21].

### 3.3. *Eco-empowerment in sustainable management perceptions*

#### *H3: Eco-empowerment affects sustainable management perceptions*

The value of EY has a positive and significant effect on SP. This result is confirmed by looking at the path coefficient value (original sample estimate) of 0.760 and a significant level of the p-value of 0.000, thus accepting the third hypothesis. Active conservation activities carried out by the community, primarily through the younger generation, encourage increased perceptions of sustainability. Biodiversity that appears after environmental empowerment activities strengthens the perception of environmental quality for the better. Environmental empowerment activities through CSR positively impact the prevention and reduction of abrasion at several activity locations. The decrease in sedimentation makes the water clean and, at the same time, gives a positive response. The abrasion distance at the mangrove planting location is reduced, thus strengthening the perception of the success of environmental empowerment [22].

### 3.4. *Stakeholder role, eco-empowerment, and sustainable management perceptions*

#### *H4: Stakeholders' role affects sustainable management perceptions through eco-empowerment*

The SR value has a positive and significant effect on SP through EY, confirmed by the path coefficient value (original sample estimate) of 0.499 and the significance level of p-value 0.000, thus accepting the fourth hypothesis. The role of the facilitator and coordination by the government with non-government stakeholders in environmental empowerment activities has a positive impact on improving the quality of the mangrove environment and increasing perceptions of ecological sustainability. The most felt impact is that the community can develop many sectors based on mangrove biodiversity. The encouragement of government investment policies is, at the same time, encouraging non-governmental organizations to care about the environment for every company that cares about Sayung to help accelerate programs and increase positive perceptions of environmental sustainability. The accelerated role of government and non-government institutions through the rehabilitation of expanding mangrove forest stands has a positive impact on the biodiversity of organisms. The positive perception is that biodiversity contributes to household food security because it helps the recovery of ecosystems, the number of fish increases, non-fish protein sources are increasingly diverse, and opportunities for cultivating coastal commodities [23]. Implement environmental clean-up efforts by empowering people to rehabilitate estuarine and coastal areas, enhancing ecosystem quality while minimizing abrasion, erosion, and sedimentation. The positive response to empowerment activities encourages the community to take an active role. Although some youths have independently conducted mangrove nurseries, some have had the opportunity to sell some of the seedlings to rehabilitate coastal areas.

## 4. Conclusion

Stakeholders in Sayung have five roles, namely: a) policy creator; b) coordinator; c) facilitators; d) implementers; and e) accelerators. The five roles have a direct and positive influence on ecological empowerment by the community, as well as two positive influences both directly and indirectly on the perception of the sustainability of mangrove ecosystem management. The active participation of the community, in general, and the younger generation can accelerate conservation and rehabilitation efforts. Community empowerment activities and movements for the environment, which are the creation of stakeholders, positively influence the perception of the quality of the mangrove environment for the better and support ecological sustainability. Perceptions of biodiversity in mangrove ecosystems are positively related, and their effects are increasing. Expanding the mangrove area through two empowerment activities with the aim of planting, caring, and monitoring has an impact on increasing biodiversity and new entrepreneurial opportunities. Eco-empowerment by the community through

cleaning the living environment, coastal areas, and estuaries can reduce abrasion and erosion in estuaries, coasts, and mangrove areas.

## References

- [1] Wahyudin Y, Kusumastanto T, Adrianto L and Wardiatno Y 2018 A social ecological system of recreational fishing in the seagrass meadow conservation area on the east coast of Bintan Island, Indonesia *Ecol. Econ.* 148 22–35
- [2] Handayani I G A K R, Sulistiyono A, Leonard T, Gunardi A and Najicha F U 2018 Environmental management strategy in mining activities in forest area accordance with the based justice in Indonesia *J. Leg. Ethical Regul. Issues* 21 1–8
- [3] Gurjar U R, Takar S, Bunkar K, Pathak V and Singh J 2019 Present status on distribution, biodiversity and management of Indian mangroves *Res. Biot.* 1 16–22
- [4] Onrizal O, Ahmad A G, Thoaha A S and others 2020 The Correlation Between Mangroves and Coastal Aquatic Biota *Journal of Physics: Conference Series* vol 1542 p 12064
- [5] Sugandini D, Effendi M I, Thamrin H M, Priyadi U and others 2019 From Environmental Knowledge to Conservation Behaviour *Calitatea* 20 101–7
- [6] Sugandini D, Mujanah S, Sudiyarto S, Nur Indah P, Priyadi U and Muafi M 2018 The effect of integrated marketing communication, environmental responsibility and voluntariness toward electricity saving behavior intention *Int. J. Civ. Eng. Technol.* 9 86–95
- [7] Arfan A, Side S, Maru R and Juanda M F 2021 Mangrove forest management model as sustainable production forest of post COVID-19 in South Sulawesi, Indonesia *Asian J. Conserv. Biol.* 10 234–9
- [8] Utami T N, Fattah M and Iintyas C A 2022 The System Dynamic of Mangrove Ecotourism of “Kampung Blekok” Situbondo East Java Indonesia: Economic and Ecological Dimension *Environ. Res. Eng. Manag.* 78 58–72
- [9] Nining N, Malik A, Arfan A and Maru R 2021 Community perceptions on and participation in mangrove protection efforts for climate change in Pannikiang Island, South Sulawesi *IOP Conference Series: Earth and Environmental Science* vol 763 p 12067
- [10] Irawan N C, Hartoyo E, Suswadi and Mustaqim 2022 Environmental management and stakeholder roles in sustainable tourism development: a feasibility study *IOP Conf. Ser. Earth Environ. Sci.* 1108 012068
- [11] Dewi D N, Muhammad A S and Suswaini E 2020 Analisis Jejaring Pelaku Pariwisata di Kabupaten Bintan: Studi pada Event Ironman Bintan *J. Sociohumaniora Kodepena* 1 101–15
- [12] Surya B, Syafri S, Sahban H and Sakti H H 2020 Natural resource conservation based on community economic empowerment: Perspectives on watershed management and slum settlements in Makassar City, South Sulawesi, Indonesia *Land* 9 104
- [13] Sigit D V, Miarsyah M, Komala R, Suryanda A and Ichsan I Z 2020 Attitude to Conserve Mangroves and Coral Reefs in Environmental Education: Survey and Analysis in Community *Indian J. Public Health* 11 677
- [14] Purwanti P, Fattah M, Qurrata V A and Narmaditya B S 2021 An institutional reinforcement model for the protection of mangroves sustainable ecotourism In Indonesia *Geo J. Tour. Geosites* 35 471–9
- [15] Lukman K M, Uchiyama Y, Quevedo J M D and Kohsaka R 2021 Local awareness as an instrument for management and conservation of seagrass ecosystem: Case of Berau Regency, Indonesia *Ocean & Coast. Manag.* 203 105451
- [16] Harahab N, Primyastanto M, Semedi B and others 2021 Collaborative-based mangrove ecosystem management model for the development of marine ecotourism in Lembar Bay, Lombok, Indonesia *Environ. Dev. Sustain.* 23 6838–68
- [17] Marlianingrum P R, Kusumastanto T, Adrianto L and Fahrudin A 2021 Valuing habitat quality for managing mangrove ecosystem services in coastal Tangerang District, Indonesia *Mar. Policy* 133 104747



- [18] Asadi M A and Pambudi G S 2020 Diversity and biomass of mangrove forest within Baluran National Park, Indonesia *Aquac. Aquarium, Conserv. & Legis.* 13 19–27
- [19] Eddy S, Milantara N, Sasmito S D, Kajita T and Basyuni M 2021 Anthropogenic drivers of mangrove loss and associated carbon emissions in South Sumatra, Indonesia *Forests* 12 187
- [20] Rudianto R, Darmawan V, Isdianto A and Bintoro G 2022 Restoration of coastal ecosystems as an approach to the integrated mangrove ecosystem management and mitigation and adaptation to climate changes in north coast of East Java *J. Coast. Conserv.* 26 1–17
- [21] Esthi R B, Irawan N C and Setiawan I 2022 The nexus between ecological competence, forest area management, and sustainable agroecosystem performance for communities around Mount Merbabu National Park (MMbNP) *IOP Conference Series: Earth and Environmental Science* vol 1108 p 12019
- [22] Waluyati L R, Suryantini A, Masbaitubun H, Maturbongs L H and Irawan N C 2010 Produk Domestik Regional Bruto (PDRB) Hijau Sektor Pertanian di Kabupaten Jayapura *Agro Ekon. UGM* 17 123–30
- [23] Irawan N C 2010 Ketahanan pangan dan kesejahteraan rumahtangga tani di Kabupaten Sleman, Bantul dan Kulonprogo (Universitas Gadjah Mada)

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