Stakeholder roles in the Baluno Mangrove Learning Center Ecotourism

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Abstract. Coastal resource management has a high complexity because the coastal area represents an interaction space involving many stakeholders with different interests. Therefore, sustainable coastal resource management requires a stakeholder synergistic roles. An example of coastal resource management that involves many stakeholders is mangrove ecotourism. The stakeholder roles in the mangrove ecotourism area has not been reported widely. One of the mangrove ecotourism areas that is currently growing rapidly is the Baluno Mangrove Learning Center Ecotourism (BMLC Ecotourism). This ecotourism area is located in Majene Regency, West Sulawesi, Indonesia. The stakeholder roles in BMLC Ecotourism area had been rarely studied before, so it is necessary to analyze the stakeholder roles. This study aims to analyze the stakeholder roles in BMLC Ecotourism management. The stakeholder roles were assessed using participatory prospective analysis. The stakeholder roles were determined using the influence and dependency quadrants between stakeholders. There were nine stakeholders involved in the BMLC Ecotourism. These stakeholders had 27 roles. NGOs and government agencies were important stakeholders in the BMLC Ecotourism management. NGOs were the main stakeholder with seven roles. Government agencies had the roles of supporting stakeholders. The three government stakeholders who had important roles were the West Sulawesi Provincial Forestry Service (four roles), the Majene Regency Forestry and Plantation Service (three roles), and the West Sulawesi Province Environmental Service (two roles). The successful management of BMLC Ecotourism was achieved due to the synergistic roles and good cooperation of stakeholders. The avoidance of conflicts of interest also helped.
Key Words: mangrove ecosystem, NGO, stakeholders, sustainable development.

Introduction. Mangroves are tree communities that have adapted and grown on intertidal areas in the tropical region (Feller et al 2010). They grow in coastal areas that are sheltered from the waves (Tresnati et al 2020), and live optimally in coastal areas and deltas that receive mud and fresh water flow from rivers (Nybakken 2001). Mangroves have difficulties growing in steep and bumpy coastal areas with strong tidal currents. These two conditions do not allow silt deposition, which is needed as a mangrove substrate (Dahuri 2003).

Mangrove forests have several physical, ecological and socio-economic functions. Physically, mangrove forests can reduce the negative impact of sea waves and storm winds, and prevent coastal abrasion. Mangrove forests can also function as sea water intrusion control, buffer areas, induction of land expansion, and shoreline protection from abrasion (Nybakken 2001).

Ecologically, mangrove forests are nursery grounds, feeding grounds and spawning grounds for various species of fish, shrimp, and other marine biota (Nybakken 2001; Sari et al 2020a). The mangrove forest economy is a producer of wood for construction materials, firewood, charcoal and paper raw materials (pulp), a supplier of fish larvae, shrimp and other marine biota to other coastal ecosystems, and as an ecotourism area (Nybakken 2001; Bengen 2004; Tuwo et al 2009; Tuwo 2011; Satyanarayana et al 2012). The greatest benefits of mangroves as a contributor to ecosystem services are carbon

storage, support for small-scale fisheries, and as ecotourism area (Tanner et al 2019). Ecotourism is a tourism activity that relies on natural landscapes and the life of organisms, plants and animals as the tourist attraction (Tuwo et al 2007; Natha et al 2014; Sari et al 2020b).

The physical, ecological and economic roles of mangrove forests have decreased due to unsustainable use. Globally, the area of mangrove forests has decreased significantly. For example, Indonesia has one third of the world's mangroves (Hamilton & Casey 2016), but between 2000-2014, Indonesia was recorded to lose one of the largest mangrove forest areas in the world, a loss of 4364 km^2 or around 311 km^2 per year. That loss was equivalent to losing around 120 soccer court per day, or the equivalent of losing six times the size of Singapore (Ilman et al 2016). This indicated the need for sustainable management to preserve the physical, ecological, and socio-economic functions of mangrove forests.

Currently, there are two models of sustainable mangrove forest management. First is the mangrove forest management as a conservation area. Second is rehabilitating ex-mangrove forest areas by mangrove planting. Mangrove rehabilitation aims to restore the aesthetic value and ecological function of the mangrove forest area (Patang 2012; Malik et al 2019). Sustainable mangrove forest management requires the synergistic roles of stakeholders (Bahar 2012).

The Baluno mangrove area in Majene Regency, West Sulawesi, Indonesia, is an expansion of the mangrove area by planting mangrove seedlings, and has been developed to become an ecotourism area (Massiseng et al 2020). The Baluno Mangrove Learning Center Ecotourism (BMLC Ecotourism) area is managed in a participatory way. BMLC Ecotourism has four assisted villages, i.e. Binanga Village, Totolisi Village, Sendana Village and Palisi Village. The total area of BMLC Ecotourism is 67 ha. A part of this mangrove area comes from mangrove planting. Mangrove areas in the BMLC Ecotourism are unique because the mangroves grow or were planted on a substrate of dead coral fragments.

Scarce information is present regarding the stakeholder roles in the BMLC Ecotourism. Therefore, there needs to be a study of its stakeholder roles in order to become a reference for mangrove ecotourism management and other mangrove management. This study aims to analyze the stakeholder roles of BMLC Ecotourism as an example for sustainable mangrove management.

Material and Method

Data collection. The research was conducted at the BMLC Ecotourism area in the Baluno coastal area, Sendana District, Majene Regency, West Sulawesi, Indonesia (Figure 1), from October to December 2020. The data used was primary data obtained from experts (expert judgment). The data was obtained from systematic reviews, brainstorming, and interviews with experts. Experts were selected based on the following criteria: experts due to scientific factors (academics), experts due to the position (decision makers), and experts due to experience (practitioners) (Yusuf et al 2016). The experts interviewed consisted of five expert groups. This number has exceeded the minimum requirement for the number of respondents for expert judgment research, namely three experts or expert groups. The number of experts in expert judgment research is three to seven experts (Hora 2004). The five expert groups involved in the brainstorming and in-depth interviews were: communities represented by fishermen in the Baluno coastal area, NGOs represented by the managers of the Village Community Partners Youth (VCPY) Foundation, the Village Government, represented by the manager of the Binanga Village (BVO) Enterprise (owned by Binanga Village), Majene Regency Government, represented by the leader and staff of the Regional Planning and Development Agency, and West Sulawesi Provincial Government, represented by the leader and staff of the West Sulawesi Provincial Forestry Service.

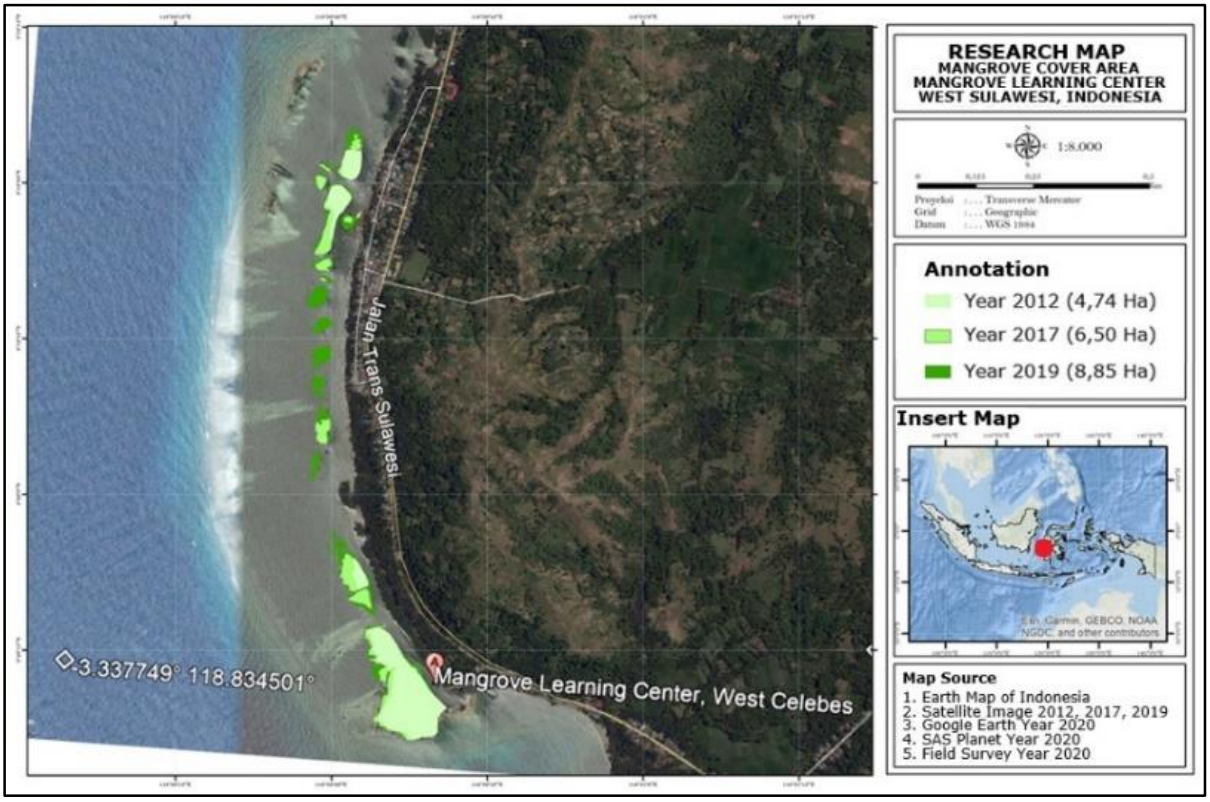

Figure 1. Location of Baluno Mangrove Learning Center Ecotourism in Majene Regency, West Sulawesi Province, Indonesia.

Data analysis. Data analysis was conducted using participatory prospective analysis (Bourgeois & Jesus 2004). Participatory prospective analysis is widely used in formulating policy alternatives in the form of strategic scenarios related to natural resource management to achieve effective and efficient conditions in the future (Hartrisari 2007). The output of this analysis is the interaction between stakeholders in management (Godet & Roubelat 1996; Bourgeois & Jesus 2004; Godet 2010). The stages of participatory prospective analysis were: (1) determining the topic of the study, in this case, the stakeholder analysis in the management of BMLC Ecotourism; (2) determine the elements and attributes of the study, i.e. the key elements or stakeholders; (3) defining and describing the possible evolution of the future, at this stage, identifying how the key elements can change by determining the state of each element, examining which changes can occur simultaneously, and describing the scenario by pairing the changes that will occur, by discussing scenarios and their implications for the system. The influence and dependence between stakeholders are presented in the form of a matrix (Bourgeois & Jesus 2004). The stakeholder roles were given a score between 0 and 4. A score of zero is given if it has no effect, a score of one if it has a weak effect, a score of two if it has moderate effect, and a score of three if it has a strong effect (Bourgeois & Jesus 2004).

The key factors are determined by referring to the four quadrants that indicate the level of influence and dependence between elements or stakeholders in the system (Hardjomidjojo 2002) (Figure 2).

Analysis of key elements or stakeholders was used as part of the planning process to identify and assess the viewpoints relevant to the project undertaken in an environmental or conservation planning. Stakeholders usually consist of local government, private sector, scientists, community owners of the area and local natural resources. Stakeholders are involved in an action or policy directly or indirectly, and become one of the decision makers (Vogler et al 2017).

The roles of stakeholders were divided into four quadrants (Adimu et al 2017). Quadrant I represents the input quadrant or driving variables. This quadrant consists of stakeholders that have a strong influence and low dependence among stakeholders.

Quadrant II represents the stake or leverage variables. This quadrant consists of stakeholders who have strong influence and dependence among stakeholders is also strong. Quadrant III represents the output quadrant or the output variable. This quadrant consists of stakeholders who have low influence and strong dependence among stakeholders. Quadrant IV represents the unused or marginal variable quadrant. This quadrant consists of stakeholders who have low influence and low dependence among stakeholders.

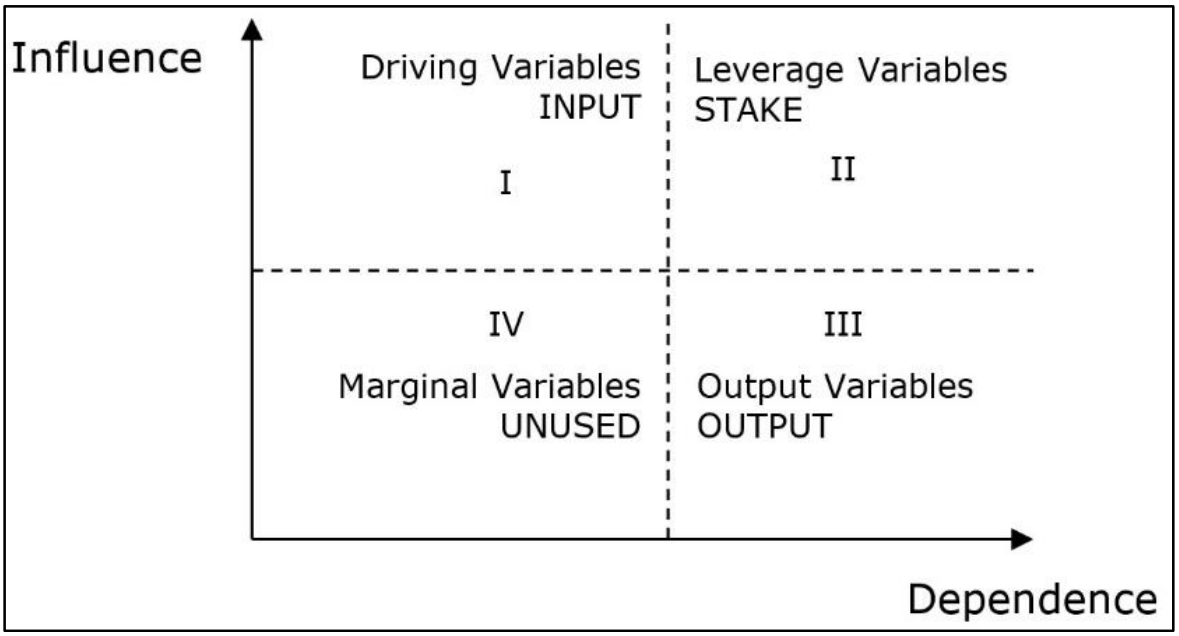

Figure 2. Quadrant of influence and dependence between key elements or stakeholders of Baluno Mangrove Learning Center Ecotourism.

In general, there were two forms of stakeholder distribution in the influence and dependency quadrants. The first form was the distribution that tends to converge on the diagonal of quadrants IV and ll. This form indicates that the system formed is unstable because most of the key elements or stakeholders have marginal or leverage variable elements. This makes it difficult to develop strategic scenarios for the future. The second form was the distribution of key elements or stakeholders who tend to gather in quadrant I to quadrant III, as an indication that the system being built was stable because it showed a strong relationship, where the driving variable regulates the output variable strongly. In this second form, strategic scenarios can be built more easily, efficiently and effectively and are strategic in nature (Bourgeois & Jesus 2004).

Results and Discussion. During the study, nine key elements or stakeholders of BMLC Ecotourism were identified. By brainstorming and interviews, 27 roles of stakeholders in the management of Baluno MLC ecotourism were found (Table 1).

The prospective analysis of stakeholders indicated that NGOs (VPCP Foundation) were the main stakeholder in the management of BMLC Ecotourism. NGOs were the driving variables or input (Quadrant I) (Figure 3). Apart from NGOs, there were three stakeholders who have a fairly strategic role (weight ≥1), namely the Forestry Agency of West Sulawesi Province, Environmental Agency of West Sulawesi Province, and Forestry and Plantation, Agency of Majene Regency (Table 2). The global strength score describes the strength of each stakeholder. A higher global strength score shows a greater influence of certain stakeholders in the BMLC Ecotourism management system.

Table 1

The stakeholders roles in the Baluno Mangrove Learning Center Ecotourism management

Stakeholder	Symbol	Roles
Village Community Partners Youth (VPCP) Foundation, NGOs	A1	(1) Establishing a Mangrove Learning Center (MLC); (2) Planting mangroves along the coastal area of four villages in Sendana District; (3) Forming community groups for mangrove seeding; (4) Managing BMLC Ecotourism; (5) Fostering a community of 100 households to support BMLC Ecotourism; (6) Providing awareness to the public on the importance of protecting mangrove resources; (7) Train the community to plant mangrove seedlings on dead coral fragments;
Forestry Agency of West Sulawesi Province	A2	(8) Partners in selling mangrove seedlings produced by assisted communities of NGOs; (9) Promote the sale of mangrove seedlings to other regions and provinces; (10) Supporting mangrove planting in the Majene Coastal area; (11) Making tracking in the mangrove ecotourism location;
Forestry and Plantation Agency of Majene Regency	A3	(12) Carrying out mangrove planting involving the community; (13) Supporting the coastal communities empowerment; (14) Partnering with the Forestry Agency of West Sulawesi Province in allocating budget for ecotourism facilities;
Environmental Agency of West Sulawesi Province	A4	(15) Carrying out mangrove planting involving local communities; (16) Routinely provide outreach to local communities about environmental preservation that supports ecotourism;
Marine Affairs and Fisheries Agency of Majene Regency	A5	(17) Empowering fishermen groups; (18) Empowering the community in processing fishery and mangrove products
Ministry of Environment and Forestry of the Republic of Indonesia	A6	(19) Mangrove planting involving local communities; (20) Providing capital for mangrove seedling businesses
Binanga Village (BV) Enterprise	A7	(21) Partnering with NGOs in managing BMLC Ecotourism;
Fishermen community leader in the Baluno coastal area	A8	(22) Practicing mangrove seedling; (23) Selling mangrove seeds; (24) Processing mangrove fruits; (25) Participating in BMLC Ecotourism management as owner of food stalls or restaurants;
Regional Planning and Development Agency of Majene Regency	A9	(26) Support the planning and procurement of facilities for BMLC Ecotourism; and (27) Initiating the Baluno coastal area becoming Essential Ecosystem Area

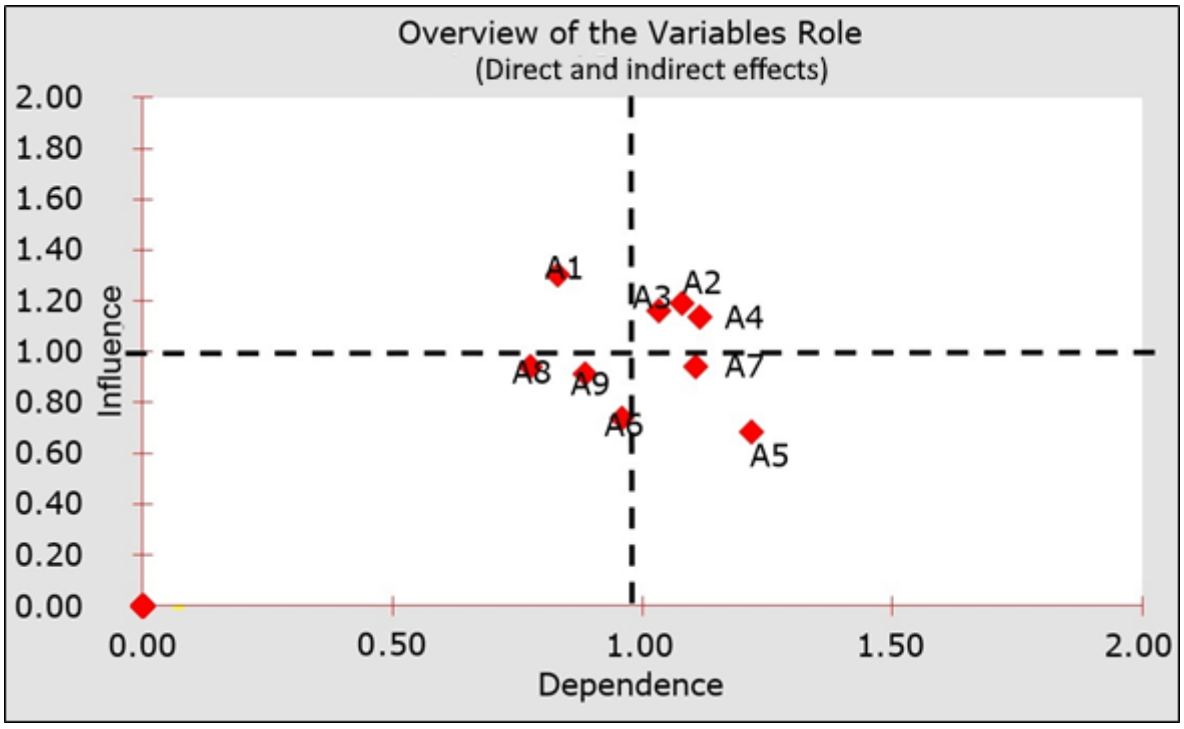

Figure 3. Quadrant of influence and dependence between key elements or stakeholders of Baluno Mangrove Learning Center Ecotourism.

Table 2
Global strength scores of the key elements or stakeholders of Baluno Mangrove Learning Center Ecotourism

Key elements (stakeholders)	*Symbol*	*Global strength score*	*Quadrant*
Village Community Partners Youth (VPCP) Foundation, NGOs	A1	2.2	I
Forestry Agency of West Sulawesi Province	A2	1.66	II
Environmental Agency of West Sulawesi Province	A4	1.06	II
Forestry and Plantation, Agency of Majene Regency	A3	1	II
Regional Planning and Development Agency of Majene Regency	A9	0.92	IV
Fishermen community leaders in the Baluno coastal area	A8	0.65	IV
Ministry of Environment and Forestry of the Republic of Indonesia	A6	0.57	IV
Marine Affairs and Fisheries Agency of Majene Regency	A5	0.49	III
Binanga Village (BV) Enterprise	A7	0.44	III

The NGO (VPCP Foundation) was in the first quadrant position (driving variables), meaning that the NGO had a strong influence, and dependence to other stakeholders was low. This can be seen from its ability to be the initiator of various activities or roles. The Forestry Agency of West Sulawesi Province, Environmental Agency of West Sulawesi Province, and Forestry and Plantation, Agency of Majene Regency were in the second quadrant position as leverage variables, meaning that they have a strong influence, and dependence to other stakeholders is also strong. The strong dependence on other stakeholders can be seen from the unified coordination line between the Forestry Agency of West Sulawesi Province and the Forestry and Plantation, Agency of Majene Regency in supporting mangrove planting and community empowerment in the area of BMLC Ecotourism (Figure 4). The species of mangroves from BMLC Ecotourism area are *Rhizopora mucronata*, *Camtostemon philippinens*, *Bruguera ghimnorrhiza*, *Aegiceras corniculatum*, and *R. stylosa* (Tuwo 2011; Tresnati et al 2020). The species planted was only *R. mucronata.*

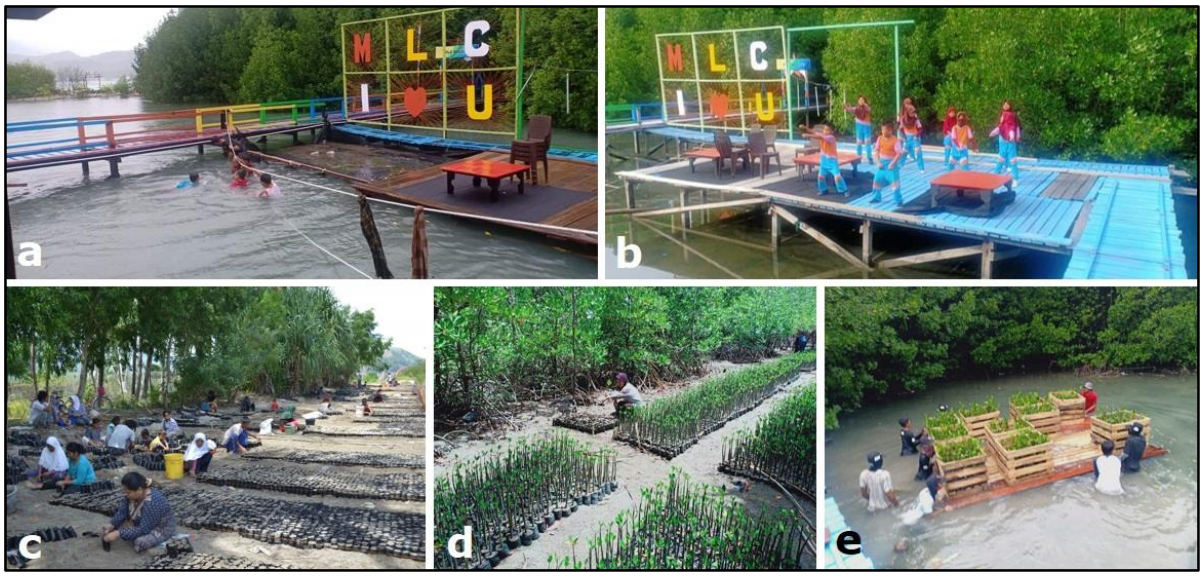

Figure 4. Some activities involving the stakeholders at Baluno Mangrove Learning Center Ecotourism; a - main gate; b - student visits; c - mangrove seedling planting; d - maintaining mangrove seedlings; e - transportation of mangrove seedlings for planting.

The Marine Affairs and Fisheries Agency of Majene Regency and BV Enterprise were in the third quadrant position (output variables). Stakeholders in this quadrant have a low influence, but with a strong dependence on other stakeholders. The low role in BMLC Ecotourism activities and the high dependence on other stakeholders causes this stakeholder to have the lowest global strength scores. The Regional Planning and Development Agency of Majene Regency, the fishermen community leader in the Baluno coastal area, and the Ministry of Environment and Forestry of the Republic of Indonesia

were in the fourth quadrant position (marginal variables). Stakeholders in this quadrant have low influence and low dependence on each other. Stakeholders in quadrant IV had a free character, were not bound by the BMLC Ecotourism activities, their role in the BMLC Ecotourism was low, and the level of cooperation with other stakeholders was also low (Figure 3).

Stakeholder analysis is part of the planning process to identify and assess the viewpoints relevant to the activities carried out in a plan. Stakeholders can be involved directly or indirectly in management activities, and become part of the decision making (Vogler et al 2017).

The main stakeholder in the management of BMLC Ecotourism was the VPCP Foundation (NGO). VPCP Foundation was founded in 1990. It established the Baluno Mangrove Learning Center (BMLC) in 2005. BMLC subsequently developed into BMLC Ecotourism whose areas were located in four villages in Sendana District. In 2020, the total area of the BMLC Ecotourism was 67 ha. BMLC Ecotourism follows the success of the Tongke-Tongke Ecotourism in South Sulawesi, which succeeded in developing a mangrove area of 249 ha by mangrove planting initiated and carried out by local communities (Mursalim et al 2020). The mangrove planting in Tongke-Tongke has received the highest environmental award in Indonesia, the Karpataru Award, for the Environmental Service category from the President of the Republic of Indonesia in 1995 (Tresnati et al 2020). The VPCP Foundation also plays a role in mangrove planting activities, the formation of mangrove seedling groups, management of BMLC Ecotourism, fostering communities involved in ecotourism activities, increasing public awareness on the importance of preserving mangrove resources, and training in techniques for planting mangrove seedlings on dead coral fragments areas. This huge contribution includes the VPCP Foundation in the top rank in terms of global strength scores for the management of BMLC Ecotourism. A high global strength score indicates that the VPCP Foundation has a strong influence in the management of BMLC Ecotourism. This high global strength score occurs due to the success of the VPCP Foundation in partnering with other stakeholders. Stakeholder partnerships can streamline and ensure the sustainability of management activities. Partnership between stakeholders can be seen from the five aspects of coordination, implication, integration, synchronization, and cooperation among stakeholders (Kuhaja 2014). These five aspects of the partnership have been implemented in BMLC Ecotourism. The success of the VPCP Foundation in managing BMLC Ecotourism has received recognition with three awards in environmental management: (1) award from the Indonesian Biodiversity Foundation, the Kehati Award, for the Sustainable Initiative Category for its efforts to grow mangroves on dead coral fragments areas in 2015; (2) award from the Governor of West Sulawesi, the Governor Award, for its achievements and services in environmental and forestry management and preservation in 2019; and (3), award from the press media, the Sulbar Express Award, for the category of Environmental Inspirational Figure in 2017.

Supporting stakeholders in the management of BMLC Ecotourism are government agencies and communities. The first supporting stakeholder is the Forestry Agency of West Sulawesi Province. The Forestry Agency has contributed in facilitating the sale of mangrove seedlings produced by VPCP Foundation Baluno-assisted community groups to buyer partners in South Sulawesi Province, such as Makassar City, Palopo City, Pinrang Regency, Mamuju Regency, Luwu Regency in Sulawesi, and Central Sulawesi province, such as Palu City. The Forestry Agency also contributes by providing mangrove seeds, tracking construction for BMLC Ecotourism, and supporting mangrove planting on the coast of Majene Regency.

The second supporting stakeholder was the Environmental Agency of West Sulawesi Province. The Environmental Agency contributes to mangrove planting and outreach to communities at Baluno coastal area concerning the importance of environmental preservation as a support for ecotourism. Ecotourism outreach content was related to an understanding of the ecotourism concept that prioritizes the ecological preservation, socio-cultural and economic aspects of the community (Latupapua 2015). The outreach activities at BMLC Ecotourism include ecological preservation, socio-cultural and economic content.

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The third supporting stakeholder was the Forestry and Plantation Agency of Majene Regency. The Forestry and Plantation Agency has contributed to mangrove planting involving the coastal communities of Baluno, and has provided assistance to coastal community groups in processing mangrove fruits, whose products were sold in the BMLC Ecotourism area.

The fourth supporting stakeholder was the Regional Planning and Development Agency of Majene Regency. The Regional Planning and Development Agency had contributed to the provision of ecotourism facilities, and coordinated with other institutions and agencies competent in protecting mangrove forests. The Regional Planning and Development Agency was the initiator of the formation of the Baluno coastal area into an Essential Ecosystem Area in 2019.

The fifth supporting stakeholder was the local community who contributes to producing mangrove seedlings, selling mangrove seedlings, processing mangrove fruits, and managing food stalls and restaurants. Local community involvement in the BMLC Ecotourism area was more dominant at the level of technical activities than at the level of planning and decision making. The involvement of local communities at the planning and policy-making level can take the form of opinions in policy making, consultation on technical management policies, and involvement in the decision-making process (Kustanti et al 2014). The success of BMLC Ecotourism management was due to the active participation of the local community. Low local community participation was one of the reasons for deficient mangrove ecotourism management (Idajati et al 2016). Management of ecotourism and mangrove conservation is more successful if it is carried out in a participatory way that largely involves the local community (Treephan et al 2019). The involvement of local communities in mangrove management aims to identify perceptions and accommodate the interests of local communities (Arumugam et al 2020). Sustainable coastal resource management must consider the characteristics of the local community. Therefore, local community involvement is necessary in the formulation of comprehensive policies. Comprehensive coastal resource management has five characteristics: it is local based, oriented towards increasing welfare, partnership-based, holistic, and sustainable (Dahuri 2000; Dahuri et al 2004). The five characteristics of this comprehensive management have been applied to BMLC Ecotourism.

The sixth supporting stakeholder was the Ministry of Environment and Forestry of the Republic of Indonesia. The Ministry of Environment and Forestry, through its labor-intensive program, has contributed to planting mangroves and providing capital for mangrove nurseries for local communities.

The seventh supporting stakeholder was the Marine Affairs and Fisheries Agency of Majene Regency. The Marine Affairs and Fisheries Agency actively supports the development of fishermen groups and fishery product processing groups, including mangrove fruit processing.

The last supporting stakeholder was the Binanga Village (BV) Enterprise. BV Enterprise has contributed by collaborating with the VPCP Foundation in managing ecotourism.

The success of stakeholders from government agencies was achieved due to their ability to avoid involvment in conflicts of interest that usually occur in management activities (Widodo et al 2018). Conflicts of interest can disrupt coordination between institutions or stakeholders. Good coordination can avoid the gaps that reduce management capabilities (Pattimahu et al 2010). In some cases in Indonesia, good coordination and partnership between government and non-government stakeholders were the key to success in mangrove ecotourism management (Idajati & Widiyahwati 2018) and other tourism objects based on coastal and marine resources (Akhmad et al 2016).

Mangrove ecosystem management is a very complex activity. Therefore, it requires accommodation capabilities and a synergistic cooperation mechanism between stakeholders so that each management activity plan can run synergistically and sustainably. The basis for cooperation between stakeholders in ecotourism development is the distribution of main tasks and functions, the existence of clear institutional rules, the existence of a common vision and mission of institutions, agencies and community groups

(Widodo et al 2018). Cooperation between stakeholders must be established in the form of horizontal and vertical coordination (Handayani et al 2016).

In managing coastal resources that require the involvement of all relevant stakeholders, the government must take more initiatives. In some cases in Indonesia, the government must revitalize and reform every institution to function effectively through strengthening the organization's culture and values. This aims to create partnership in carrying out the duties and functions of each stakeholder involved (Wahyono 2017; Wati 2017). This kind of partnership has appeared in BMLC Ecotourism. Stakeholder partnership is needed because area-based management has complexities related to the ecological and socio-economic conditions (Reinl & Kelliher 2014). Cooperation in mangrove forest management can be more effective when considering stakeholder preferences (Wahyono 2017; Wati 2017; Thompson & Friess 2019). Mangrove ecotourism management will also be more effective if there is the same perception among stakeholders (Martínez-Espinosa et al 2020).

Of the 27 roles, a role of stakeholders in waste management was not found, even though waste is one of the main problems in the mangrove ecotourism area (Luo et al 2020; Paulus et al 2020; Sari et al 2020b). The unique mangrove root system (Tuwo 2011) causes the mangrove area to become a waste trap area. Therefore, it is recommended to pay more attention to waste management.

The stakeholder roles in BMLC Ecotourism did not indicate any promotional activities to attract tourist visits. Promotion is an important part in developing ecotourism and mangrove conservation (Treephan et al 2019). Therefore, stakeholders, especially government stakeholders, need to develop promotional activities.

Conclusions. Baluno MLC Ecotourism involves nine stakeholders. Stakeholders perform 27 roles. NGOs are a key element in the management of MLC Baluno ecotourism on the coast of Majene Regency. Apart from NGOs, there are three other stakeholders who have supporting roles, namely the Forestry Agency of West Sulawesi Province, the Environmental Agency of West Sulawesi Province, and Forestry and Plantation, the Agency of Majene Regency. The successful management of BMLC Ecotourism was achieved due to the role and synergic cooperation of stakeholders, and the ability of stakeholders to avoid involvement in conflicts of interest.

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