The role of communities in conserving mangrove forests to achieve sustainable development

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Abstract. The function of the forest and mangrove forest both ecologically, economically and socially is very much felt by the community so far, but now it has been damaged due to increasing population and very limited land availability, so people choose to open the forest with the aim of earning a living, conditions this of course needs to be accompanied by conservation efforts so that the function of forests for the community can continue without damaging the environment. The objectives of this study are: (1) Factors that cause forest destruction in the City of Baubau; (2) Community participation in forest conservation in the City of Baubau. This type of research is descriptive qualitative using interview techniques to informants both community leaders and the community around the forest. The results showed that (1) a. Lack of community knowledge about the function of forests, especially community forestry, if community groups who are members of community forestry are empowered, the community around the forest will prosper because in addition to carrying out the function of forest conservation, they can also sell forest products; b. The community still considers the forest as the main livelihood, therefore government efforts are needed in community empowerment in the economic field for those who live around the forest; c. Forest conversion and illegal logging, some gardening, making ponds or housing because of the lack of clarity of forest boundaries according to the community. (2) The community did not understand their role clearly, so they themselves destroyed the forest because they opened a garden in the forest up to several kilometers so that it penetrated the South Buton District, so there were still some trees visible from the outside but when they entered inside. all of their forests are garden communities so there needs to be serious attention from the local government. To enhance the role of communities in maintaining the economic and ecological functions of forests, communities need to be given basic knowledge, especially ecosystem restoration.

1. Introduction
Efforts to preserve forests due to human activities that utilize forest products are not wise and prudent, even causing environmental damage such as illegal logging, opening mining, extensification of agriculture in a broad sense, and the use of mobile land. All of the symptoms mentioned are indeed the work of humans themselves both living around the forest and those from outside who invest in forestry products both wood and non-wood just for profit. Community involvement is highly expected, especially the community around the forest in preserving the forest so that the function of the forest can have a positive impact on the community and also life in the forest, because one of the forests is
producing oxygen that is needed by humans, can save water as a reserve in season dry, also the forest will make the living creatures at home will not leave the forest and enter the community environment, because food reserves are available in the forest. If the function of the community around the forest is empowered to preserve the forest, then no one will dare to use the forest illegally, because the community itself will play an active role in preventing wider forest destruction as happened in the Sorawolio District of Baubau City, as seen by the forest from the outside it turns out more and more inside the wood stands or trees are no longer visible.

Interaction between communities around the forest becomes an important part in managing forests based on the environment, towards forest preservation. To support policies in forest management in the future, various policies are needed in the direction of decentralization and deconcentration of management resources (forests) between the central and regional governments. Likewise more effective cooperation (partnerships) in the management of forest resources between the people and the government based on the principles of justice, sustainability, democratic and transparency. This is an important part of the community-based forest management framework. For the achievement of environmentally sound development in the forestry sector, development needs and the urgency to strengthen environmental awareness should come first from the forest concessionaires as perpetrators of activities, so that the government and the community can more effectively carry out guidance and supervision.

If the forest is not managed properly, it will cause disaster, because there is forest destruction that is not accompanied by conservation efforts, which in turn are the people of Baubau City who are the victims and this has been felt by people in Bungi District who cannot harvest their fields because of flooding. Places that usually occur in Baubau City according to the Head of the Baubau City Regional Disaster Management Agency (RDMA), the floods usually hit the Bungi Subdistrict and in front of Baubau 2 State High School, forest fires in Sorawolio District, house fires in the Region Bataraguru and Tomba villages, Batupuaro Subdistrict with the threat of big waves, sponsored in Wolio Subdistrict, those points that the community must watch out for. The Regional Disaster Management Agency of Baubau has made various efforts to cope with disasters, one of which is installing 300 signs of disaster evacuation routes. These signs are installed at several points including temporary evacuation sites, including the Regional Work Unit offices, sub-district and village office[1,2].

Losses caused by natural disasters are also not small, and even tend to increase. Losses due to floods that hit Jakarta in February 2007, for example, according to estimates from the National Development Planning Agency (NDPA) and the United Nations Development Program (UNDP) reached around Rp. 8.8 trillion. It can be ascertained that the losses due to floods nationally are greater than this figure considering similar disasters have also struck various other Indonesian regions. Based on the Indonesian Disaster Information Data (IDID) National Disaster Management Agency (NDMA), it is known that flood disasters accounted for around 35 percent of the total number of disasters that occurred in the period 1997-2009 which totaled 6,632 times (Kompas, March 1, 2010) [3].

The same condition also occurs in mangrove forests, because in Baubau City there is a lack of mangrove forests due to human activities that open ponds and housing around mangrove forests. This problem is the same with mangrove forests elsewhere.

One of the problems of mangrove forests in Kubu Raya is the decrease in forest area every year, this is due to the conversion of mangrove forest land. Research conducted in July 2013 aims to obtain information about the role of mangrove forests, diversity, species potential, carbon content and management policies in Kubu Raya, West Kalimantan. Plots were made in three places and each of them was made ten 10 x 10 m samples for tree inventory and 50 m spacing between plots, in plots made for 5 x 5 m sub plot for belta level inventory and 2 x 2 m for seedling level inventory. The results showed that in mangrove forests 20 species of trees were found with 4 dominant species namely *Rhizophora apiculata, Bruguiera gymnorrhiza, Sonneratia alba* and *Xylocarpus moluccensis*. The role of mangrove forests is characterized by biomass and carbon content in the study area of 438.79 tons/ha (equivalent to 219.53 tons C/ha or 805.68 tons CO/ha). Mangrove conservation needs to be done holistically and cooperation between the parties including the Ministry of Environment and
Forestry, the Ministry of Maritime Affairs and Fisheries and Local Government, to avoid overlapping policies based on the assessment of each party [4]. Deforestation and conversion of mangrove forests into ponds are the main factors of mangrove forest degradation. The population has a positive perspective on the existence of mangrove forests, destruction done due to economic pressures [5].

Understanding belta and seedlings in mangrove forests, namely belta is a woody plant that has a diameter at breast height (1.3 m) between 2 cm to less than 10 cm. The minutes were observed in 5 m x 5 m plots, made in 10 m x 10 m plots, in species, diameter and height data. Whereas the seedlings are from seedlings to 1.5 cm height; plot size 2 m x 2 m, made in 5 m x 5 m plots, in type and amount data [4].

Mangrove forest area besides functioning physically as a beach abrasion barrier, as a biological function, mangroves provide food for human life, especially fish, shrimp, shellfish and crabs, and energy sources for life on the coast such as plankton, nekton and algae. According to Supriharyono (2000), there are 38 types of mangroves that grow in Indonesia, including the genera Rhizophora, Bruguiera, Avicennia, Sonneratia, Xylocarpus, Barringtonia, Lumnitzera and Ceriops. Ecologically the use of mangrove forests in coastal areas that are not managed properly will reduce the function of the mangrove forest itself which has a negative impact on the potential of biota and other forest ecosystem functions as habitat [4].

The function of the forest and mangrove forest both ecologically, economically and socially is very much felt by the community so far in the City of Baubau, but now it has been damaged due to increasing population and very limited land availability, so people choose to open the forest with the aim of earning a living, conditions this of course needs to be accompanied by conservation efforts so that the function of forests for the community can continue without damaging the environment. Ecosystem restoration needs to be carried out to restore the economic and ecological functions of the forest including its social functions. Ecosystem Restoration, which is an effort to restore the condition of natural forests in production forest areas while enhancing the function and value of forests, both economically and ecologically. [6] This study aims to analyze the factors that cause forest destruction in the City of Baubau and to see the level of community participation in forest conservation in the City of Baubau.

2. Methodology
This research was conducted from February to April 2019 on people living around forest areas in the City of Baubau. This study uses materials in the form of a list of questions that will be used for informants, to facilitate the research phase. While the tools used during the study are stationery in the form of pens and field notebooks and cameras that will document the research activities.

The procedure of this study begins with conducting data collection activities, both primary and secondary data. Primary data obtained through interviews with informants. Namely the people who live near the forest area. Secondary data were obtained from various reports both from the kelurahan and from the Forestry Office. Data analysis was performed using qualitative descriptive methods (Lambert and Lambert, 2012). Qualitative descriptive studies describe the natural conditions of a research locus, leading to a commitment of these natural conditions to a better level [7].

3. Results and Discussion
The problem of forest destruction is a serious problem and the government, including the regional government, should carry out studies and evaluations of integrated forest management mechanisms by involving the role of communities around the forest to ensure the sustainability of the forest in the future, so that it can be enjoyed by our grandchildren and those who live. now need to guarantee that. Therefore, the Forestry Service of the Southeast Sulawesi Province as a regulator and coordinator of forestry institutions/agencies in the provinces/districts/cities, needs to make improvements through the restructuring of the forestry sector institutions, by means of among others the need to form forest management units for each unit forest area under an existing work unit with adequate facilities, and needs comprehensive and integrated coordination between various components involved in forest
management, so that we no longer hear about illegal logging, illegal forest encroachment, forest control by some communities without there are clear rules.

The Forestry Service of Southeast Sulawesi Province needs to prepare a reporting system or public complaints that are updated and integrated online even though there is already an online service system that is the Online People's Aspirations and Complaints Service (OPACS) is a social media-based aspirations and complaints facility that is easily accessible and integrated with 81 Ministries/Institutions, 5 Local Governments, and 44 State-Owned Enterprises in Indonesia. Online People's Aspirations and Complaints Services developed by the Office of the President's Staff in order to increase public participation for program supervision and government performance in the implementation of development and public services. However, this service system has not been utilized properly, as evidenced by reports from the community that entered 4 September 2018, at 13.50 Central Indonesia Time. The contents of the complaint "we hereby want to complain about the problem of forest management in the Bombana region, that the fact is only a group of rich people who enjoy the results, the community does not get welfare". The complaint did not receive a response until this research ended in early May 2019. This can be seen at the link https://www.lapor.go.id/instansi/dinas-kehutanan-pemprov-sulawesi-tenggara/waiting. This shows that the government in this case the Forestry Service of Southeast Sulawesi Province has not prepared itself with the current era of globalization, and forestry issues are not getting a response, so people do not want to provide input, because there is no response from the service system that has been provided. This is of course very detrimental in terms of rapid reaction in dealing with efforts to destroy the larger forests, due to community activities that are not in accordance with procedures and will certainly harm us all both society, government and the world globally.

Factors that cause forest destruction include mangrove forests in Baubau City, namely:

1. Lack of community knowledge about the function of forests including mangrove forests, especially supported by low levels of education, the average community only finishes junior high school. This certainly affects the knowledge of the people who live around the forest in terms of ownership, because there is a perception of some people who think that clearing land in the forest for agricultural crops and plantations as happened in Sorawolio District, where the forest is used as paddy land, namely rice fields and planting other horticultural crops and forests in Bungi District the forest is used as cocoa and horticultural plantations and this has been going on for decades, so the forest boundaries are not clear and people have claimed that their land, because they have been working for a long time, but the parties the government cannot do anything and does not provide support to these illegal farmers who use the forest as their agricultural business area. Proven wild farmers are not given assistance by the government either in the form of seeds, medicines, calculations in getting fertilizer supply or the formation of farmer groups, so those listed as farmer groups are those who have agricultural land rather than in the forest. Likewise, damage to mangrove forests in Kampeonahu Sub-district of Bungi Sub-District and Lowu-lowu Sub-District of Lealea Sub-District of Baubau City, which considers the mangrove forests to belong to the surrounding community, so that they cut down arbitrarily some are used as firewood, some are cut down because land is converted into ponds, there are also cut down for construction activities and landfills. The government, in this case the Forestry Service, needs to promote community forestry with the community empowerment approach around the forest, so that the community can carry out the function of forest conservation, while at the same time selling forest products. The impact of community activities on forests that are not wise and prudent, gives rise to forest vegetation and mangrove forests, decreases and the sustainability or sustainability of the forest is not properly maintained. Therefore, planting trees for vacant land needs to be encouraged again in the form of reforestation, rehabilitation, reforestation, reforestation and restoration of ecosystems, given the function of forests that can prosper the lives of the surrounding communities.

2. Communities around the forest still consider the forest as the main livelihood, so the community only looks at the economic aspects and does not see the ecological aspects. Therefore the government needs to empower people in the economic field for those who live around the forest, so
that they can have businesses outside the forest, not only rely on businesses in the forestry sector, so that they can support their family life, such as being given good skills in sewing skills, business workshop such as welding, processing of agricultural products, and improving skills for construction workers and others. This is in line with the results of research conducted by Hartati and La Harudu that the condition of the mangrove forest at the research location has been damaged as a result of human activities to meet their needs and by only paying attention in terms of the economy without regard in terms of ecological functions so that the mangrove forest causing a lack of public knowledge about the functions and uses of mangrove forests and a lack of government attention regarding the capacity of mangrove forests. The main factor that causes damage to mangrove forests is the cutting down of mangrove vegetation and it is used as firewood and building materials such as houses and bridges by people who live around mangrove forests. In addition to logging activities that are used for firewood and construction materials, it is also carried out the clearing of ponds from logged-over areas that have been carried out [8]. One of the uses of mangrove forests is that mangroves have enormous potential in mitigating global warming because mangroves are able to absorb very large CO\(_2\) gas from the atmosphere at a higher rate per unit area, compared to absorption from terrestrial forests [4].

3. The community does not know the real forest boundary, this makes farmers compete to expand their agricultural area so that it continues to encroach on the forest, even there are some farmers in the City of Baubau namely in the District of Sorawolio, who open gardens in the forest up to several kilometers and have penetrated the South Buton District, so there are still some trees that are visible from the outside but when they enter the forest, they are all community planters, so there needs to be serious attention from the government in this case the Forest Service to determine the actual forest boundaries and must be socialized to the people in around the forest including the mangrove forest through the Baubau City Government, so that the community does not arbitrarily cut down the mangrove forest either wishes to make a pond with open land, moreover making it easy and inexpensive, so that it is economically, profitable and for the urgent need for firewood for households, because a There are no other trees around that will be used for firewood, so the community is looking for the easiest way to overcome their life problems.

The level of community participation around the forest and mangrove forests needs to be raised in awareness to encourage the planting of one person one tree, one million trees for barren land, and forest community awareness is still quite good, for example by providing tree seedlings that can be utilized by the community like nutmeg trees, clove trees, candlenut trees and others. On the other hand the community can be introduced to forest ecotourism and mangrove forests. Ecotourism can be seen as a concept of sustainable tourism development that aims to support environmental conservation efforts and increase community participation in its management [9]. The community is also taught how to optimize existing land without destroying forests. Based on data in the field that forest damage due to farmers’ land is already lacking, productive, not to mention the presence of pests and plant diseases, this is based on observations in the field many farmers who leave the land they have been working on and began to encroach the forest, evidence of this a lot of land that is not neglected there is overshadowing each other, there is overgrown with weeds, some are attacked by pests and plant diseases, not to mention the knowledge of farmers who are still lacking with productive age of plants. Therefore farmers can be taught how to manage their farms by paying attention to environmental aspects such as the use of vegetable pesticides. The use of plant-based pesticides for pest and plant disease attacks on cocoa plants should farmers use plants that have the potential as plant-based pesticides around them, because besides being environmentally friendly to create organic cocoa gardens, they are also cheap so that farmers can reach them the price ratio of 1:10 with the same size even if produced on its own the price is getting cheaper because the ingredients are not all purchased, because they are in the environment of farmers [10].

Basically a forest area can be utilized by taking into account its nature, characteristics and vulnerability, and it is not justified to change a forest area that has a protection function and an in-
depth and comprehensive study must be conducted [11]. So the use of forests must be in accordance with the main functions of the forest, namely the function of conservation, protection and economy. These three functions must be synergized in order to preserve the forest.

4. Conclusion
The results showed that (1) a. Lack of community knowledge about the function of forests, especially community forestry, if community groups who are members of community forestry are empowered, the community around the forest will prosper because in addition to carrying out the function of forest conservation, they can also sell forest products; b. The community still considers the forest as the main livelihood, therefore government efforts are needed in community empowerment in the economic field for those who live around the forest; c. Forest conversion and illegal logging, some gardening, making ponds or housing because of the lack of clarity of forest boundaries according to the community. (2) The community did not understand their role clearly, so they themselves destroyed the forest because they opened a garden in the forest up to several kilometers so that it penetrated the South Buton District, so there were still some trees visible from the outside but when they entered inside. all of their forests are garden communities so there needs to be serious attention from the local government. To enhance the role of communities in maintaining the economic and ecological functions of forests, communities need to be given basic knowledge, especially ecosystem restoration.

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