

## Analysis of Participatory Approaches of Community-Based Sustainable Marine Protected Area Management Groups

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### KEYWORDS

Marine Protected Areas;  
Marine Sustainable  
Fisheries; Participation;  
Sasi Culture

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### ABSTRACT

This study was conducted to see the role of community participation in the management of community-based marine protected areas. In addition, this study also shows the impact of conservation area management on improving community welfare and improving the quality of the environment. The research design used is a mixed method which is a combination of qualitative and quantitative analysis. Qualitative analysis uses in-depth interview methods with resource persons, while quantitative analysis uses the one-sample test method to test respondents' perceptions related to research variables. The research sample consisted of the Head of the Management Group, Village Head, Traditional Head, Religious Leaders, and Community Member Representatives in Roon District, Teluk Wondama Regency, West Papua, Indonesia. Research findings show that the role of the community in the management of conservation areas is very high, this can be seen from the supervisors of conservation area management groups consisting of Government, Religious, and Social groups. In addition, active participation from the community around the conservation area is also the key to the success of good area management. The findings of one sample test showed, that 1) The participation of members of the Marine Protected Area group has been classified as high, 2) Sasi culture has been proven to affect the income level of the community, 3) Member participation has been proven to be active in decision making, 4) The existence of Sasi has been proven to increase the sustainability of natural resources, 5) Proven to successfully contribute to the achievement of SDG number 14.

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### 1. Introduction

Indonesia is one of the largest archipelagic countries in the world with the number of islands reaching around 17,504 pieces. In addition to the number of islands, Indonesia is one of the countries with the longest coastline with a length of more than 95,181,000m according to the 2022 BPS report. Diverse biodiversity makes Indonesia's coastal areas have great potential to be managed (Pranata &

Satria, 2015); (Wardono & Muslih, 2020). According to the IUCN definition, a Marine protected area or Marine Protected Area (MPA) is declared as a water area including flora, fauna, and related cultural and historical features protected by law or other effective means, to protect part or all of the surrounding environment (Mossy, 2020).

According to statistics from the Ministry of Marine Affairs and Fisheries, the number of Indonesian fishermen in 2021 reached 5,088,581 people. Communities and fishermen who live close to marine protected areas are key to the success of preserving these areas (Hadika, Karuniasa, & Herdiansyah, 2021). According to community-based natural resource management is one of the keys to sustainable village development (Rahmat & Apriliani, 2022). Community-based management is particularly relevant for coastal villages and islands in the tropics (Hoshino, van Putten, Girsang, Resosudarmo, & Yamazaki, 2017). Environmental sustainability and economic growth of the community are balances that should be maintained. This can be seen from the basis of sustainable development which always places environmental, social, and economic pillars in development. The practice at the community level can take various forms, In Indonesia this practice is not new, because the ancestors have in various forms of customary law and culture have carried it out in various regions. One of them is the Sasi or Kadup culture in eastern Indonesia (Anjani, 2014).

The research problem to be raised in this study is how effective and impactful the participatory approach of community-based sustainable marine protected area management groups is. This study aims to review and evaluate the process and results of participatory approach analysis conducted by community-based sustainable marine protected area management groups to increase their capacity, awareness, and involvement in the sustainable management of aquatic resources. This research uses qualitative and qualitative mixed method methods with data collection techniques through observation, interviews, surveys, and documentation.

The Participation Ladder is a concept that classifies the level of involvement of children in decision-making processes that impact their lives. The concept was created by Roger Hart, an expert on child development and participation. According to Hart, there are eight levels of child participation, symbolized by eight steps. The first rung of the ladder is manipulation, which means children are forced or persuaded to do something without their understanding. The eighth rung is children's participation in decision-making with adults, which means children are perceived as equal partners and have a voice heard. The Participation Ladder can help us to evaluate how much children's rights are respected and fulfilled in various situations, such as at home, at school, in the neighborhood, and in the community (Mamokhere & Meyer, 2022).

This study adopted the Ladder of participation theory by Arnstain Sherry in 1969. Arnstain's participation ladder theory discusses the participation of American society in its country planning process (Sembiring, 2023); (Sopanah, 2010). Eight stages define the level of participation, this stage will show the role and participation of the community or members in the decision-making that a group will make. This model describes the level of community participation in decision-making and program implementation. The participation ladder consists of 8 levels, which are divided into 3 degrees of community participation, namely: Non-Participation, Degrees of Tokenism, and Degrees of Citizen Powers.

**Table 1. Participation Ladder**

8. Citizen Control
7. Delgasi
6. Partnership
5. Placation
4. Consultasi
3. Informasi
2. Terapi
1. Manipulasi

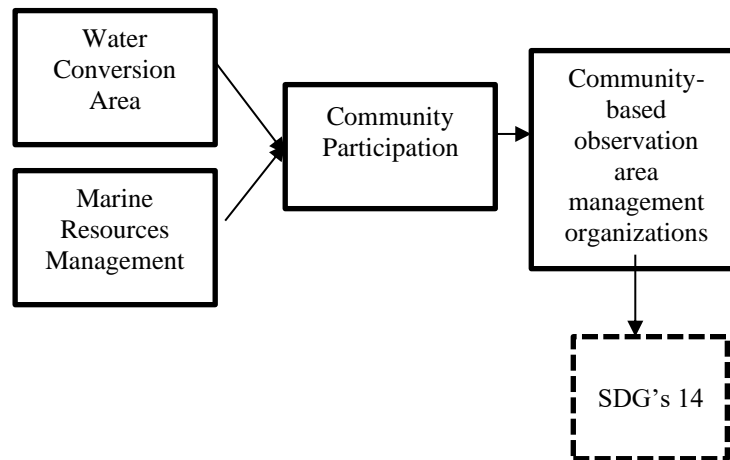
Food Waste (fw) refers to the decrease in the amount or quality of food that occurs due to decisions and actions from retailers, food services, and consumers (Lins, Puppini Zandonadi, Raposo, & Ginani, 2021); (Makanjuola, Arowosola, & Chenyu, 2020). Fw can be divided into two categories based on its feasibility, namely edible food waste (fw that can still be consumed) and inedible food waste (fw that cannot be consumed). An example of edible food waste is withered vegetables, while an example of inedible food waste is coffee grounds (Ballad, Morooka, & Shinbo, 2022).

Food Waste Management (FWM) refers to efforts involving various levels and related parties to prevent and reduce food waste through diverse solutions (S. AlQahtani, Khan, Ahmed, & A. AlQahtani, 2024); (Närvänen et al., 2019). The main principle of FWM is the 4Rs, namely refuse, reduce, reuse, and recycle (Tenriawaru et al., 2021). Refuse means reducing the amount and type of products consumed to produce less waste. Reduce means reducing sources of waste by eliminating products that produce waste on a large scale. Reuse means reusing a product before it becomes waste without physically altering it so that the product can be used repeatedly. Recycling means recycling waste into raw materials for new products. The recycling process includes sorting waste, manufacturing derivative raw materials, and producing new products (Suprpto & Purwanti, 2014).

Community-based marine protected areas are management efforts that involve local communities in the preservation and management of coastal and marine areas (Indouw, Maturbongs, & Prabawardani, 2022). In Indonesia, the government has committed to establishing marine protected areas throughout Indonesia covering an area of 20 million hectares by 2020. Communities are given utilization space for fisheries within conservation areas, such as fishery zones, utilization zones, or other zones. Some key points in community-based marine protected area management include Concerns: Local communities, especially fishermen, should be given space to manage their concerns in conservation area management. Traditional rights: Communities are granted traditional rights in the management of conservation areas, such as customary law-based management of marine

resources. Community-based marine resources management This management involves the community in the management of marine resources, especially in fisheries zones (Ninef, Adrianto, Dahuri, Rahardjo, & Adhuri, 2019).

This research uses a conceptual framework prepared by modifying the main journal related to the object of research (Teladia & van der Windt, 2022). The conceptual framework of this research is described with the following concept:



**Figure 1. Conceptual Framework**

## 2. Materials and Methods

The research design used is a mixed method which is a combination of qualitative and quantitative analysis. Qualitative analysis uses an in-depth interview method to resource persons, while quantitative analysis uses one sample test method to test respondents' perceptions related to research variables. The research variables used were Participatory Ladder, Sustainable fisheries, community-based conservation, policies, benefits and challenges, Strategy, and SDG 14.

In this study, data were obtained from primary data. Primary data refers to data obtained through in-depth interviews, FGDs, and surveys of resource persons. In-depth interviews are a method of interviews conducted with key informants who have a significant role in the context of research. The purpose of an in-depth interview is to gain a deeper understanding of the events, activities, people, organizations, feelings, motivations, demands, concerns, and anything else relevant to the study. Surveys are also used to obtain Quantitative data.

In this study, sampling was carried out using the non-probability sampling method. Non-probability sampling is a method that does not provide an equal opportunity for every element or member of the population to be selected as a sample. The non-probability sampling technique used in this study is purposive sampling. Purposive sampling is a sampling technique that is carried out deliberately by selecting samples based on certain objectives. In purposive sampling, samples are selectively selected to obtain the most relevant and representative information related to the research topic. This study involved 30 respondents consisting of group leaders, village heads, religious leaders, management members, and communities around marine protected areas in Roon Teluk Wondama District.

To analyze the results of research findings related to the implementation of the Program in reducing the impact of climate change, this study uses content analysis, namely analysis of aspects of Input – Process – Impact. This analysis is conducted on the compatibility between the programs being run, and the involvement of stakeholders in the program, as well as the impact resulting from program interventions and the involvement of these stakeholders.

To strengthen the validity of the findings, this study used the Triangulation method. Triangulation is an analytical technique that involves comparing data from different sources or techniques. In this study, Source Triangulation and Triangulation Techniques were used. Source triangulation is done by verifying findings by comparing data from different informants and comparing the results of this study with other relevant studies. Meanwhile, Triangulation Techniques are performed to test the credibility of data by examining data from the same source but using different analysis techniques.

### **3. Result and Discussion**

The Community-Based Marine Protected Area in the Wondama Bay area is commonly referred to as Sasi. Sasi management in Wondama Bay recognizes the term three furnaces, namely custom, church, and government (village / regional) where all three support the application of sasi rules. The involvement of three social groups in the management of conservation areas invites high participation from communities living around the area.

In general, everyone in Menarbu Village knows about the prohibitions and all the rules in the sasi or Kadup in Menarbu so in the EAFM assessment score it is seen that the fisheries management model at the Menarbu sasi location is in good condition. The Sasi arrangement in Wondama Bay regulates all marine area management systems. With the Sasi regulation, the Community stipulates a ban on fishing activities in marine waters and some coastal areas (Lewerissa, Ashri, & Asis, 2021).

In the implementation of the Menarbu Sasi Open, it is known that there are rules made by the Menarbu Village Sasi Management Group together with the community. However, obstacles in the field are still encountered violations of the rules that have been made. Some of these violations were made by the Menarbu community and those made by other Kampung communities in the open sasi area of Menarbu Village. These violations include: 1) Violations by the Menarbu community Violations of sasi rules committed by the Menarbu community are only involuntary negligence in catching small catches and laying eggs. However, there were only a few cases, and BUMKA Yenui as the buyer of these products did not receive biota in these conditions and continued to tell fishermen not to take prohibited marine products. 2) Violations by communities outside Menarbu Violations committed by communities outside Menarbu have been tried to be prevented by the Sasi Management Group. The prevention is in the form of coordination with the government of neighboring villages, especially 6 villages within Roon District, regarding information on open sasi rules and the process of permitting outside fishermen to search in the open sasi area. These violations are as follows: Catching seafood without the permission of the sasi manager, taking seafood in areas that are not opened in open Sasi, Using compressors to find sea cucumbers

The test results of one sample test for the variable Active Participation of Members resulted in an average value of 4.4510 which shows that the overall active participation rate of members is already high. With a statistical value of 14.221, a p-value of  $0.000 < 0.05$  is obtained, which means that

$H_0$  is rejected and  $H_a$  is accepted so that it can be concluded that the level of active participation of members has a high intensity.

In its management, the three groups of communities that jointly manage marine protected areas are established under the village government, with the village head, religious leaders, and traditional leaders as group leaders. The group leader is responsible for the daily activities of the sasi management group such as patrolling, monitoring, and administration.

The test results for the Participation in decision-making variable resulted in an average value of 4.3235 which means that member participation in decision-making is high (active). A statistical t value of 16.252 yields a p-value of  $0.000 < 0.05$  which means that  $H_0$  is rejected and  $H_a$  is accepted so that it can be concluded that the participation of decision-making members is active.

In the Roon district, there are three Kadup locations, namely Kampung Menarbu Kadup, Aisandame Kadup, and Auri Island Kadup. The Menarbu and Aisandami Village Kadup are managed by the Sasi Manager of each village while the Auri Island Kadup is managed by a kadup management group consisting of 6 villages on Roon Island. Kadup Menarbu has a total area of 1,396 hectares, with two zones, namely the core zone covering an area of 412ha, and the utilization zone covering an area of 984ha. Menarbu Village has a culture of customary rules similar to sasi called "kadup" which is interpreted as a place closure in the Roon language. The Menarbu kadup area is divided into two parts, namely full cup and type cap where the type of kadup is applied to several types of marine resources, namely lobster (*Panulirus* sp), sea cucumber (*Holothuroidea*), Lola (*Trochus niloticus*), and pea pea (*Pinctada* sp).

Fishermen who catch at the time of opening sasi are almost similar to their daily fishing habits, there are only restrictions imposed by the parties. Menarbu Village Sasi Management Group. This restriction is in the form of rules prohibiting species such as 1) Dugongs, 2) Sharks, 3) Parrotfish, 4) Napoleon Fish, 5) Sea turtles, 6) Laying fish and small ones. The use of fishing gear used by fishermen during the permitted opening of the case is as follows: 1) Fishing, using fishing rods and nylon, 2) Molo, using molo glass, molo guns, and flashlights, 3) Balobe, with lights and kahawai

Traditional fishing activities are still permitted, while for a full cup, all natural resources in the area cannot be taken. During the two-month opening period in Menarbu Village, it is known that there are fluctuations in fishermen who sell fish at BUMKa Yenui Menarbu Village. In March 2020 it was known that there were 14 days of sales of seafood from fishermen and in April there were only 5 days of sales. Fishermen who go to sea and sell to BUMKa in a day range from 1 to 25 fishermen. Fluctuations occur due to several factors, including the need for BUMKa orders, weather factors, and the undeniable impact of the COVID-19 Pandemic. During the waiting time for BUMKa delivery, fishermen will sell their fishing products to meet the order quota, this is enforced to avoid over-harvesting by fishermen. There were three peak days when sales of seafood from fishermen to BUMKa were high, namely on March 18, 20, and 26, 2020. Almost similar to the fluctuation in the number of fishermen selling produce, the catch weight was also high in March 2020. There are two peak days where the catch weight is high, namely on March 18, 20, and 25, 2020 (Shin, Woo, & Choi, 2022).

The test results for the variable influence of sasi culture on community income resulted in an average value of 4.3715 which means that members feel an increase in income by becoming sasi members. A statistical t value of 20.905 yields a p-value of  $0.000 < 0.05$  which means  $H_0$  is rejected and he is accepted so that it can be concluded that members feel a significant increase by becoming a member of the sasi.

The processing results for the Natural Resources Sustainability variable resulted in an average value of 4.4632 which means that respondents assessed that objections can improve the sustainability of natural resources. The statistical t value of 19.982 obtained a p-value of  $0.000 < 0.05$  which means that  $H_0$  is rejected and  $H_a$  is accepted so that it can be concluded that the existence of sasi can increase the sustainability of natural resources.

The processing results for the variable contribution of SDG 14 resulted in an average value of 4.5647 which means that respondents to the existence of sasi proved to make a significant contribution to SDG 14. The statistical t value of 23.079 obtained a p-value of  $0.000 < 0.05$  which means that  $H_0$  is rejected and  $H_a$  is accepted so that it can be concluded that the existence of sasi contributes significantly to SDGs 14.

#### **4. Conclusion**

Community-based Marine Protected Area management patterns are as follows: Zoning Determination, Sasi Open and Close Determination, Patrol Activities, and Monitoring Activities. Management of marine protected areas at the research site still adheres to management patterns with cultural, customary, and religious values. The Marine Protected Area management group in Roon District plays an active role in increasing the participation of communities living around the conservation area. This can be seen from the involvement of village heads, religious leaders, and also community representatives in group board members. In addition, socialization and patrol activities are also carried out in a participatory manner, these activities are not only carried out by group members but also by the community living around. Management of conservation areas can increase the income of people living around the area. Community-based conservation area management practices and Sustainable Fisheries Practices strongly encourage economic improvement at the village and district levels, this can also be seen from the results of questionnaire surveys to resource persons that justify an increase in income for the surrounding community. Community-based management of marine protected areas in Roon District has a positive impact on the quality and quantity of marine natural resources it manages. Participatory Sasi Management is key in efforts to improve the sustainability of aquatic ecosystems Sasi Management Group plays a role in achieving Sustainable Development Goal number 14, namely Marine Ecosystems.

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