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Stakeholder Analysis in the Management of the Biyonga Watershed (DAS) Gorontalo Regency-Gorontalo Province

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ABSTRACT

Several factors cause damage to the watershed areas, such as changes in land cover, erosion, sedimentation, and the increase of critical land, which occurs almost throughout the Biyonga sub-watershed area. Another factor contributing to the damage of the Biyonga sub-watershed is the management of the Biyonga sub-watershed itself. The Biyonga sub-watershed is one of the priority sub-watersheds within the Limboto watershed. One proposed solution is to map the stakeholders involved in the management of the sub-watershed. This study aims to analyze the stakeholders involved in the management of the Biyonga sub-watershed. Stakeholder analysis is crucial to determine the implementation of policies and programs in the Biyonga sub-watershed area based on changes in the biophysical and socio-economic conditions of the watershed. Data collection methods include interviews and focused discussions. The analysis used in this study is stakeholder analysis and policy implementation analysis. Based on the analysis results, there are nine stakeholders involved in the management of the Biyonga watershed. These stakeholders include key players such as the Bone Bolango Watershed Management Agency (BPDAS), Sulawesi River Basin Agency II (BWS), Regional Development Planning Agency (Bappeda), Provincial Environmental and Forestry Service (DLHK) of Gorontalo, Environmental Service of Gorontalo Regency, Public Works and Public Housing Service (PUPR), and Forest Management Unit VI of Gorontalo. Meanwhile, the subject stakeholders consist of the community, NGOs, and universities.

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INTRODUCTION

Watersheds are a complex megasystem, including physical systems, biological systems, and human systems. Each system and sub-sub-system in it interacts with each other, the role of each component and the relationship between components greatly determines the quality of the watershed ecosystem (Latuamury, 2020). Disturbances to one component of the ecosystem will be felt by other components with a chain impact nature. The balance of the ecosystem will be guaranteed if the mutual conditions between the components run well and optimally (Ekawati et al., 2012; Nurtjahjawilasa et al., 2015).

Stakeholders are individuals or groups with substantive interests in an issue, including those who have a role in making decisions or doing so (Barney & Harrison, 2020). Another definition of stakeholder is all parties who are interested and involved in every stage of the policy development cycle, both those who prepare, advocate, implement, and are affected by a policy either directly or indirectly, and negatively or positively. In addition, stakeholders also come from relevant groups that own or hold control along with all the instruments needed in policy implementation (Setiawan & Nurcahyanto, 2018). According to (Hidayat et

al., 2020) stakeholders are as communities, both individuals and groups, who have legitimacy, power, and interests in the success of water resources management.

Stakeholders have a great role and influence on the sustainability of water resources management (Latuamury, et al., 2021). (In Baldassarre et al., 2019), it is stated that stakeholders can be divided into two parts, namely primary stakeholders and other stakeholders or supporters (secondary stakeholders). The main stakeholders related to and affecting the sustainability of water resources management include government institutions that have an important role in the management of water resources directly such as the Ministry of Public Works, the Ministry of Environment and Forestry, local governments, the private sector relevant to water resources such as drinking water companies and other partners. Meanwhile, other stakeholders or supporters consist of communities, environmental or social activist groups, and also the government and other policymakers (Luthfi, 2019).

Gorontalo Province has more than 500 watersheds based on the Decree of the Minister of Environment and Forestry Number SK.304/MenLHK/PDASHL/DAS.0/7/2018. The Limboto watershed, which is part of the Bone Bolango Watershed Management Area Unit (SWP-DAS), is one of the watersheds that is included in the priority-critical category. The siltation of Lake Limboto that has occurred over the past 30 years is suspected to be caused by the high sedimentation of the watershed above it, namely the Biyonga sub watershed. The Biyonga sub watershed is one of the watersheds located in the Limboto watershed. The Biyonga watershed is included in the category of small watersheds with an area of ± 7,391 hectares (Cahyono, et al, 2021).

The Biyonga watershed is very important because it contains the Biyonga River, where the water always flows throughout the year and as a source of clean water needs and agricultural water needs for the people of Limboto and its surroundings. The Biyonga watershed also has an important value for people's lives because of the huge economic potential of natural resources. The Biyonga watershed currently has a vulnerability to the environment. According to Tabba (2011), the condition of the Biyonga watershed is classified as somewhat degraded because it is estimated that more than 30% are in the critical and somewhat critical category. The Biyonga watershed is part of the Liboto watershed, which according to the Decree of the Minister of Forestry Number SK. 328/Menhut-II/2009 is included in the 15 Priority Watersheds. The Biyonga watershed is also an upstream area of Lake Limboto which based on the Strategic Plan of the Directorate General of Watershed Control and Protected Forests for 2020-2024 is included in 15 national priority lakes that will be repaired and restored because they have experienced a level of critical damage (Directorate General of PDASHL, 2020; Dunggio & Ichsan, 2022).

Various parties/agencies make various efforts through activity programs to overcome resource management problems in the Biyonga watershed, in accordance with the main tasks and functions of each institution/institution, both the Government, provincial governments, Regency/City Regions through the Regional Apparatus Work Unit (SKPD) and non-governmental organizations (NGOs) that care about the environment. The number of institutions and parties involved in the management of the Biyonga watershed raises problems related to the coordination of planning, implementation, and evaluation. It is necessary to understand who is influenced by decision-makers, who influences and has an interest in decision-making in a Biyonga watershed. Based on the description mentioned above, the purpose of this study is to analyze the role of the parties in the management of the Biyonga watershed, so that more appropriate policies can be taken in providing a real picture in the field of who plays an important and influential role in the management of the Biyonga watershed.

RESEARCH METHODS

The location of the research was carried out in the Biyonga watershed, Limboto District, Gorontalo Regency, Gorontalo Province. The research was carried out in February-April 2024. The data used in this study are primary data and secondary data. Primary data in this study were obtained directly from key informants and respondents through in-depth interviews and using questionnaires. Secondary data is collected from reference books, the internet, government agencies and institutions in the form of reports, archives and documentation related to research problems.

The method of taking or determining the number of respondents is carried out in a purposive way. As many as 15 respondents are representatives of stakeholders of each related agency. The analysis in this study uses stakeholder analysis using an actor diagram built by Reed et al (2009).

Data Analysis

Stakeholder analysis is an approach and procedure to achieve an understanding of a system by identifying key actors or key stakeholders in the system and assessing each interest in the system. Stakeholders are all parties who influence or are influenced by the policies, decisions and actions of the system (Bridoux & Stoelhorst, 2022). The analysis in this study uses stakeholder analysis using an actor diagram built by (Ramoglou et al., 2023). Stakeholder analysis is carried out to find out the interests/interests and roles of each stakeholder and their authority in watershed management. Stakeholder analysis is a tool for

a person to obtain information about "relevant actors" to understand their behavior, activities and influence on the decision-making process. To conduct an analysis, analysts need to take three steps, namely identifying stakeholders first, then grouping or categorizing, and analyzing the relationship between stakeholders (Freeman et al., 2021). To determine the value of influence (power) and interest (interest), the scoring method is used which is asked during FGD and interviews

In compiling the matrix of influence and interests of each stakeholder , it is acknowledged on the basis of the description of the informant's questions which are expressed in quantitative measures (in the form of scores) and subsequently grouped based on the criteria of influence and interest (Hollebeek et al., 2023). Based on the stakeholder analysis matrix, a descriptive analysis of interests and influences on stakeholders is carried out . The interests in question refer to the role of stakeholders in achieving outputs and objectives and are the focus of consideration for decisions. Meanwhile, influence refers to the power possessed by stakeholders to control the process and results of a policy. The analysis tool used is the stakeholder grid. Figure 1 shows the matrix of stakeholder analysis results as follows:

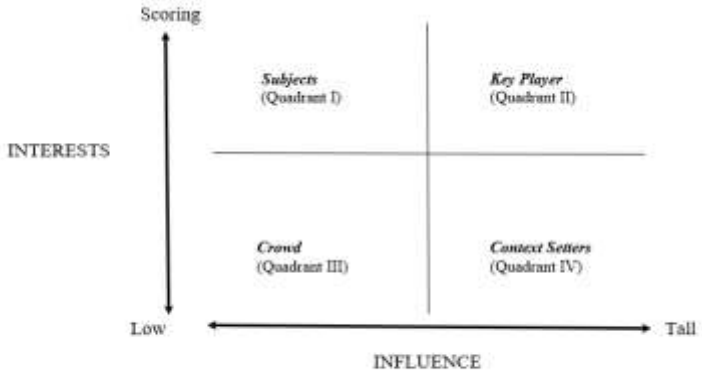


Figure 1. Stakeholder Analysis Results Matrix

The subject is a stakeholder who has a big interest but little influence. Some of these stakeholders even have seriousness in managing the Biyonga watershed better even though they do not have the power to influence or make policies or rules.

Players are stakeholders who have great interests and authority. Players can be interpreted as key implementers who have an interest and have a great influence on the better management of the Biyonga watershed.

Contest setters are stakeholders who have small interests and great influence. Contest setters in the management of the Biyonga watershed can be interpreted as stakeholders who have the function of macro planners from development and coordination, which because of their very broad scope of work, are considered to have little interest in the management of the Biyonga watershed. The influence is great because the contest setter has the influence to approve programs from related agencies, including the authority in prioritizing budgeting. Or those that have an influence on the sustainability of the watershed, even though their importance is small.

Crowds are those who have little interest and little authority. In this box, community stakeholders are included . The people in the crowd box are those who have little interest in watershed management.

RESULT

The results of the Stakeholders analysis carried out through the systematic identification of stakeholders, and conducting, assessment, comparison of interests, roles, and powers through the stages of stakeholder identification and stakeholder classification obtained the following results: Stakeholders managing the Biyonga watershed starting from upstream and downstream are multi-stakeholders, from the Central Government consisting of; The Bone Bolango Watershed Management Center (BPDASHL) and the Sulwesi II River Area Center (BWS) are responsible for the management of watersheds and water resources. Meanwhile, at the provincial level, it consists of DLHK, KPH IV which is responsible for planning, implementation and supervision according to their duties. Then the Regency / City Government consists of; PUPR Office, and the Environment Service and village government. Further details of the takeholders and their roles based on the position, as stated in the Table. 1.

Table 1. List of Stakeholders and Roles Based on the Results of Identification in Watershed Management

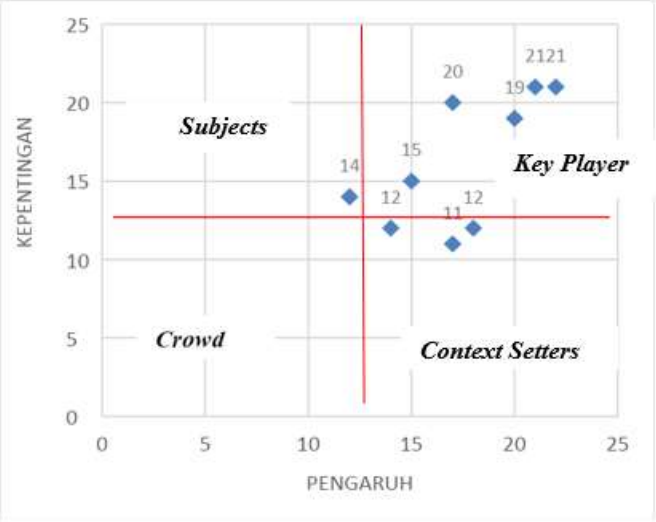
It	Stakeholders	Role
1	Bone Bolango Watershed	Implementer of forest and land rehabilitation activities as

	Management Center (BPDASHL)	well as soil and water conservation, and evaluator of watershed and protected forest management.
2	Sulwesi II River Area Center (BWS)	Implementer of water resource management in the river area which includes planning, construction implementation, operation and maintenance.
3	Gorontalo Provincial Environment and Forestry Service	Organizers of natural resource protection and conservation tasks; forest and land rehabilitation, damage control and environmental capacity building.
4	KPH IV	Technical guidance and protection of forests and forest resources, forestry law enforcement, fire prevention and control and forest security, implementation of forest and land rehabilitation, reforestation, and reclamation, as well as supervision of forestry licensing and cooperation
5	Gorontalo Regency PUPR Office	Implementing government affairs and development in the field of public works and spatial planning.
6	Gorontalo Regency Environmental Agency	Increasing Integration in Planning, Control, and Evaluation in Environmental Management on Environmental Carrying Capacity and Carrying Capacity
7	NGO	Initiators and supporters, mediators and evaluators of activities and cooperation.
8	College	Providing input based on the results of studies and research by researchers and technical experts.
9	Community	Protect the environment, implement programs and increase capacity

Table 2. Stakeholder Influence & Interest Interpretation Table

It	Stakeholders	Influence					Number (X)	Interests					Number (Y)
		P1	P2	P3	P4	P5		P1	P2	P3	P4	P5	
1	BPDASHL	5	4	4	4	4	21	5	5	5	3	3	21
2	BWSS II	5	5	4	4	4	22	5	5	5	4	4	21
3	DLHK	5	3	4	4	4	20	5	5	5	2	2	19
4	KPH IV	3	2	3	3	4	15	3	4	3	2	3	15
5	PUPR	4	2	4	3	4	17	5	5	4	3	3	20
6	DLH	3	2	3	3	3	14	3	4	2	1	2	12
7	NGO	3	2	4	4	4	17	3	3	1	3	1	11
8	College	3	1	5	4	5	18	3	3	1	3	2	12
9	Community	1	1	2	4	4	12	4	5	1	1	3	14

Remarks : 5 = Very High, 4 = High, 3 = Moderately High, 2 = Less High, 1 = Low
P1 = Influence of stakeholders in watershed management
P2 = Budget contributions and stakeholder facilities
P3 = Institutional capacity/human resources stakeholders
P4 = Level of stakeholder dependence
P5 = Intensity of stakeholders collaborating with other parties
K1 = Stakeholder involvement
K2 = Benefits of the existence of stakeholders
K3 = Authority of stakeholders
K4 = Stakeholder program
K5 = Impact of stakeholder programs
Source : Data Processing Results (2024)



Description : 1. BPDASHL (21) 2. BWS Sulawesi II (21) 3. DLHK (19) 4. KPH IV (15) 5. PUPR (20) 6. DLH (12) 7. NGOs (11) 8. Higher Education (12) 9. Society (14)
Source : Data Processing Results (2024)

Figure 2. Stakeholder Classification Matrix

Stakeholder classification is carried out by interpreting the influence and interest matrix based on the answers to the questions that produce data on the Table. 1, then the data becomes a coordinate that places the position of stakeholders in 4 quadrants. From this classification, it is known that Government agencies dominate stakeholders who have high influence and interest in watershed management, this is because Government agencies have many rules issued and activities carried out.

Kartodiharjo (2017) stated that the Government with the authority to change the rights and distribution of costs and benefits faced by other stakeholders, both groups and individuals. In addition, the Government is usually also a ruler, to a certain extent as the owner of natural resources and a party representing the public interest. The results of mapping based on influence and importance divided into 4 quadrants with various types of groups are as shown in the figure. 2.

Subjects are stakeholders who are most active in management because they have high influence and interests but do not have authority. High Interest – Low Power). The stakeholders who fall into this group include the community. The position of stakeholders is actually the right position for the achievement of watershed management activities because the community, both individuals and groups, have a high interest in the watershed both for the fulfillment of living needs and the improvement of welfare, although sometimes in the field it does not take place, the community tends to be used as an object, almost always there is a gap between the results of the implementation of activities and what the community needs (Kartodiharjo, 2017). If the output of the program is not in accordance with the needs of the target group, then it is clear that the output cannot be utilized. If the program implementing organization does not have the ability to carry out the tasks required by the program, then the organization cannot convey the program output appropriately.

Key Players are stakeholders who have high interests as well as have the resources to carry out activities starting from the planning, implementation, to monitoring and evaluation stages, which are included in this group including: BPDASHL, BWS Sulawesi II, Bappeda, DLHK, PUPR Office and FMU IV. Stakeholders in this group are agencies that have the authority and budget to carry out activities but there are differences of opinion regarding the determination of areas and types of activities, because these agencies are guided by their respective regulations, a watershed according to BPDASHL is as a unit of management area while according to BWS is part of the river area (WS) which consists of several watersheds. This difference is often the trigger for watershed management activities to be hampered. Kartodiharjo (2017) stated that at the provincial level, national regulations tend to be strongly binding that must be thought about by policy implementers or heads of regional implementing work units (SKPD) in carrying out work programs and work plans. The Watershed Forum, although it does not have the authority and budget, is part of the Key Player because as a forum formed based on the Governor's decree, it has a strong mandate to facilitate and coordinate with the parties for integration and conflict prevention in the management of the Biyonga watershed.

Crowd is a stakeholder who has little influence and interest, from the results of the interview no one belongs to this group.

Context Setters are stakeholders who have high influence but little interest, which are included in this group including: Universities, NGOs, and DLH. Universities and NGOs have many expert resources whose knowledge and views can influence decision-making in watershed management, these experts do not have any interest except when involved in programs and activities. Likewise, the Environment Agency does not have a direct interest in watershed management because it focuses more on monitoring activities that can affect watershed management.

DISCUSSION

Stakeholder analysis was carried out to determine the interests/interests and roles of each stakeholder and their authority in the management of water resources in the Biyonga watershed. Each stakeholder has a positive relationship which is shown by the cumulative value of the stakeholder attributes so that each stakeholder who has a higher value is considered more than a stakeholder who has a smaller value. This finding emphasizes that stakeholders can vary from one issue to another. Thus each stakeholder has different legitimacy and power in a case (Purnama & Sulastri, 2014)

The results of the matrix mapping analyzed the influence and interests of stakeholders descriptively. Influence refers to the power possessed by stakeholders to control the process and results of a policy, and the interest in question refers to the role of stakeholders in achieving outputs and objectives and being the focus of consideration for decisions. The results of the assessment of the influence and interests of the nine stakeholders include assessment indicators related to the management of water resources in the Biyonga watershed, including: (1) inventory activities and identification of potential and damage to the watershed, as well as the preparation of watershed management programs and plans; (2) inventory and identification of community institutional systems, development of institutional models and watershed management partnerships; (3) monitoring and evaluation of water management, land use, institutions and management of watershed management information systems; (4) developing watershed management models, institutional development and watershed management partnerships, (5) preparing forest management plans, managing watershed conservation areas and rehabilitation, as an executive institution that plays a role in water resources management, (6) preparing patterns and plans for natural resource management in river areas, preparing plans and implementing water source protected areas in river areas, managing hydrological systems, (7) community empowerment in water resources management, (8) role in water resource management, discharge and water quality measurement, (9) role in empowering communities in the fields of forestry, agriculture and plantations, (10) role as coordinators/facilitators/regulators/supervisors in the implementation of watershed management at the district/city scale and provide technical considerations for the preparation of watershed management plans in the district/city area and can play a role as implementers in certain activities, playing a role in environmental management and water quality; (11) play a role in maintaining the surrounding environment so that it can function properly, play a role in maintaining the quality of the river to keep it clean, (12) play a role in connecting sellers and land buyers, play a role as a supervisor of natural resource management activities, (13) play a role as an implementer of activities, act as a supervisor of natural resources management activities, play a role as a funder of watershed management activities.

The community is a subject that has great importance but little influence. These stakeholders have seriousness in managing water resources in the Biyonga watershed better even though they do not have the power to influence or make policies or rules. Communities living in the upstream part of the watershed play an important role in the success of watershed management and have an interest in the preservation of the watershed. Cutting down trees to clear agricultural land without the support of soil and water conservation technology will have an impact on the area below. The upstream communities of the watershed have economic and social dependence on the watershed.

BPDASHL, BWS Sulawesi II, Bappeda, DLHK Gorontalo Province, PUPR Office and KPH IV are Players , namely key implementers who are interested in and have a great influence on the better management of the Biyonga watershed. The six Technical OPDs in quadrant II (players) play their roles and duties in accordance with the technical directions and policies of the OPDs concerned. The Gorontalo Provincial Watershed Management Center, and related agencies can plan a watershed management program that is integrated (not sectoral) so that it has one goal and the upstream community can accept the program and are willing to be involved together in the activity plan to be implemented. It is necessary to enforce the rules to the maximum because through the enforcement of the rules, the conservation of the upstream watershed will be maintained, in addition to complementing regional regulations that lead to the conservation of the upstream watershed by always coordinating with the legislature so that it receives support from the legislature through the ratification of the draft regional regulations and budget support by the legislature. This budget support must also prepare part of the budget for research activities that will be carried out by related agencies and academics related to watersheds in Gorontalo Regency because the

research results can be used as a basis for what activities are feasible to be carried out in water source areas from forests to other uses.

The Sulawesi II River Area Center (BWS) of Gorontalo Province has influence related to the planning and construction of water buildings such as SPAS in the context of monitoring water levels, on rivers flowing in the Biyonga watershed. Planning and implementation activities, the River Center coordinates with technical agencies such as the Gorontalo Regency Public Works Office and the Gorontalo Regency BAPPEDA.

The Gorontalo Provincial Environment and Forestry Service has a role in the management of forest areas and the management of river border protected areas through forest and land rehabilitation work programs. Water resources management is involved in activities in accordance with their main tasks and functions.

KPH IV of Gorontalo Province plays an important role in developing community-based forest management while preserving forests up to the site level. There are extension workers in the field. Related to the maintenance of forest areas in the Biyonga watershed, they carry out forest and land rehabilitation activities.

Context Setter in the management of the Biyonga watershed is a stakeholder who has the function of macro planner from development and coordination, which because of its very wide scope of work, is considered to have little interest in watershed management. The influence is great because the contest setter has the influence to approve programs from related agencies, including the authority in prioritizing budgeting. Or those that have an influence on the sustainability of the watershed, even though their importance is small. The results of mapping the influence and interests of stakeholders related to water resources management in the Biyonga watershed show that there are three stakeholders in quadrant IV (Contest Setter), namely the Gorontalo Regency Environment Office, universities, and NGOs.

The Gorontalo Regency Environmental Agency has a very important role and function as a government agency related to environmental issues. Environmental agencies are tasked with formulating, planning, coaching, coordinating, controlling and monitoring technical aspects in the field of pollution and environmental impacts and regional environmental damage in accordance with the strategic plan that has been set by the Regional Government. This agency has the authority to monitor environmental quality, including the quality of river water in the Regency/City.

Universities are stakeholders who help review policies from the academic side. Environmental organizations (NGOs) are stakeholders who play a role in environmental protection and management and play an active role in supervision, providing suggestions, opinions, proposals, objections, complaints and the submission of information and reports.

CONCLUSION

The results of the study show that there are 9 stakeholders involved in the management of the Biyonga sub-watershed, government stakeholders are generally included in the category of key players who have high interests as well as have resources to carry out activities, which are included in this group including: BPDASHL, BWS Sulawesi II, Bappeda, DLHK, Gorontalo Regency Environment Agency, PUPR Office, and FMU Unit IV. Meanwhile, stakeholders outside the government are included in various other categories, namely Subject, Crowd and Context Setter. Looking at the current conditions, it is necessary to improve comprehensive and synergy-based policies between stakeholders who play a role in river management and policy improvements, including increasing community influence in policy implementation, increasing firmness in licensing, supervision and law enforcement, as well as regular coordination between stakeholders in reviewing the condition of river management and industrial waste control.

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