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INTEGRATING SOCIAL-ECONOMIC APPROACHES FOR INTEGRATED WATERSHED MANAGEMENT AND COASTAL AREA

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ABSTRACT:
Integrated watershed management is a holistic and sustainable approach in managing water resources and the environment associated with river flow. One of the important aspects in integrated watershed management is to pay attention to the socio-economic aspects of the people living around the river. In many places in Indonesia, watershed bears a heavy burden due to its high population density and intensive utilization of natural resources, leading to environmental degradation and a decline in watershed conditions. On the other hand, the demands on watershed to support livelihood systems, including community activities and fisheries from upstream to downstream, coastal areas, and the sea, are substantial. The purpose of the study was to identify the socio-economic situation of the community and how to manage the watershed with the approach of the socio-economic aspects of the community. The method used was Qualitative analysis with observation, deep interview, and questionary. The purpose of the study was to identify the socio-economic situation of the community and how to manage the watershed with the approach of the socio-economic aspects of the community. The method used was Qualitative analysis with observation, deep interview, and questionary. The results showed that education level in the upstream area is higher than the downstream area. The level of education, employment, and community income can affect their attitudes and participation in watershed management activities. Communities who have higher education, jobs related to watersheds and coastal areas, and adequate income tend to be more active and aware of maintaining the sustainability of watersheds and coastal areas.

Keywords: Education, Occupation, Socio-economic approaches, watershed, Coastal area, Integrated management.

INTRODUCTION

Watershed, or Daerah Aliran Sungai in Indonesian, refers to a vast area that encompasses rivers and their tributaries, functioning to receive and collect rainfall, channel water, and store water resources. Watershed is an essential ecosystem where organisms and the biophysical environment interact dynamically. In many places in Indonesia, watershed bears a heavy burden due to its high population density and intensive utilization of natural resources, leading to environmental degradation and a decline in watershed conditions (Departemen Kehutanan, 2010). On the other hand, the demands on watershed to support livelihood systems, including community activities and fisheries from upstream to downstream, coastal areas, and the sea, are substantial (Scotford, 2017) (Agustiningsih, 2012)

Integrated Watershed Management aims to achieve optimal conditions for vegetation, soil, and water resources to provide maximum and sustainable benefits for human welfare. However, the reality is that the management system faces increasing problems year after year (Madu, 2007). The escalating issues of watershed damage and degradation summarize the cumulative events that have not yet touched the root of the problem (Baddeley, 2001). The problems of watershed degradation have existed for a long time, but the intensity and frequency have increased over time along with population growth, the increase in industries, and the expanding use of land for agriculture, inland fisheries, settlements, and cultural development (Dirjen Penataan Ruang dan Pengembangan Wilayah, 2002). The resulting impacts include environmental issues such as floods, droughts, sedimentation, erosion, landslides, eutrophication, and water quality decline (Dixon et al., 2013) (Brown & Timmer, 2006).

The social-economic approach of communities in integrated watershed and coastal area management is an approach that integrates social, economic, and ecological aspects in efforts towards sustainable management. This approach acknowledges that communities play a crucial role in maintaining the sustainability of natural resources and the environment in the watershed and coastal areas (Kaunang, 2021). Given the numerous problems in the watershed, the author wishes to study the Talawaan watershed in North Minahasa Regency, with an area of approximately 822 hectares (Arif, 2021). It possesses significant natural potentials such as waterfall tourism, natural beauty, fertile soil, mining potential, and fisheries areas (Dinas Pertambangan dan Energi, 2008; Dinas Kelautan dan

Perikanan, 2016; Pemkab Minut, 2016). These potentials are extensively utilized by the community, including artisanal gold mining. The traditional gold processing methods employed in the mining villages around the Talawaan watershed involve simple technology using mercury as a gold-capturing agent through amalgamation processes (Dinas Pertambangan dan Energi, 2008). Issues arising from artisanal gold mining include the potential for social conflicts among the community and water quality degradation, as mining waste could potentially flow into nearby rivers. Poor water quality can lead to the death of aquatic organisms, disrupt the ecology, and subsequently affect the community's health (Sumual, 2009).

The social-economic approach of the community encompasses several important aspects (Maridi, 2012), including: a) Community Involvement: this approach encourages active participation of the community in decision-making processes related to watershed and coastal area management. The community should be involved in planning, implementation, and evaluation of management programs that impact the environment and their livelihoods. b) Recognition of Local Knowledge: this approach recognizes local knowledge and experiences as valuable sources of information in integrated watershed and coastal area management. Local knowledge can include understanding of ecology, weather patterns, natural cycles, and sustainable traditional practices in natural resource utilization. c) Community Economic Empowerment: this approach aims to empower the local community economically through the development of sustainable small and medium enterprises. It can involve skills training, local product development, promotion of sustainable tourism, and fair market access. d) Development of Alternative Livelihoods: this approach encourages the diversification of community livelihoods that rely on the natural resources of the watershed and coastal areas. Developing alternative livelihoods such as sustainable agriculture, fish farming, ecotourism, or creative industries can help reduce pressure on vulnerable natural resources.

Thus, the objectives of this research are: 1. To identify the socio-economic conditions of the community in the Talawaan watershed through education, occupation, and income data. 2. To analyze the relationship between these three factors and community involvement in watershed and coastal area management.

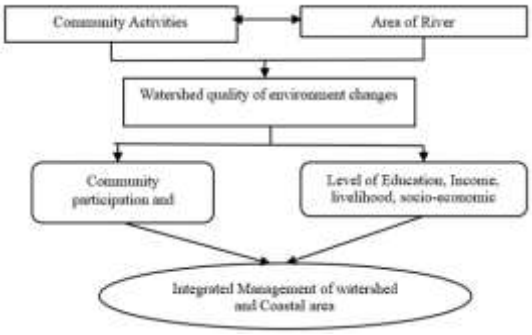
RESEARCH METHODS

The research was conducted in the Talawaan River Basin in North Minahasa Regency, with data collection taking place from April to June 2022. In general, to achieve an integrated management model, this study employed a descriptive qualitative approach and analytical research using various methods such as interviews, questionnaires, purposive random sampling, and observations to gather data and

information, both randomly and non-randomly. The social-economic study utilized an analysis of community awareness and participation in watershed management (Stagnari et al., 2010). The parameters measured included community participation and awareness, as well as the socio-economic conditions of the community. The research design can be illustrated with the following flow:

Figure 1

Flow of Community Participation & Awareness Research on Watershed



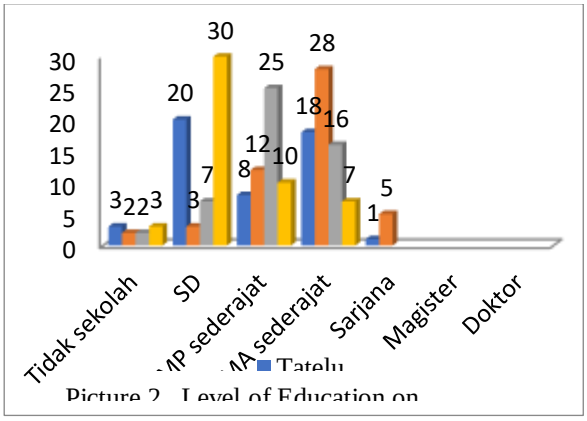
Primary Data Collection: Primary data was obtained through interviews with selected respondents using purposive random sampling. Interviews were conducted to gather in-depth information on the level of community participation and awareness in watershed management, as well as their socio-economic characteristics such as education, occupation, and income. Secondary data collection was obtained from sources such as literature, government documents, and statistical data related to the socio-economic conditions in the research area.

RESULTS AND DISCUSSION

Data on social and community aspects were obtained through the distribution of questionnaires and interviews with respondents. A total of 50 questionnaires were distributed in each village or sub-district. The research findings and interview results revealed that the age range of the respondents was between 19 and 86 years old in three villages and one sub-district, namely Tatelu Jaga V Village, Talawaan Jaga I Village, Talawaan Bajo Jaga V Village, and Bailang Neighborhood 1 Sub-district, located on the banks of the Talawaan River. Two villages were selected from the upstream area of the Talawaan River, while the other two villages were from the downstream coastal area of Manado City. The results can be seen in the following image/graph:

Figure 2

Respondents in The Four Villages

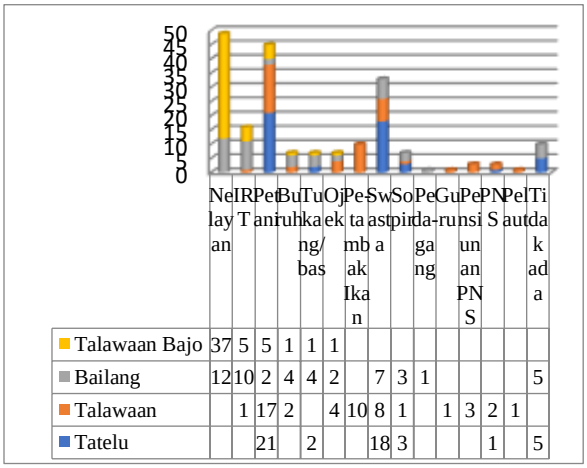


Picture 2. Level of Education on

The data in Figure 2 shows that 34% of respondents in the four villages have completed their education up to Senior High School (SMA), followed by Junior High School

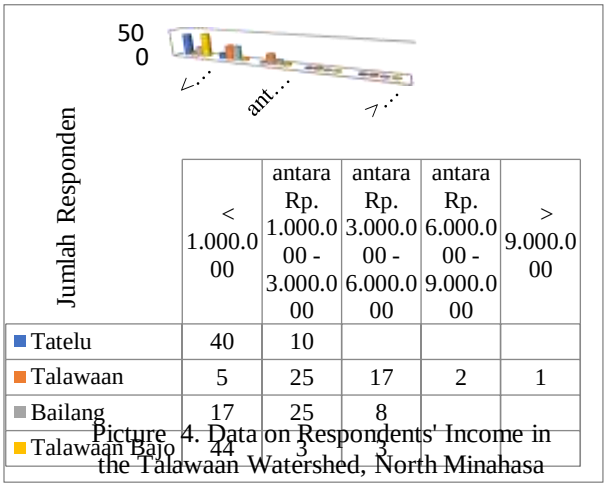
(SMP) and Elementary School (SD). Only a small number of respondents have obtained higher education degrees, such as a bachelor's degree. Furthermore, there were 5% of respondents, who did not receive any formal education. The level of education of the community can influence their awareness and knowledge of the importance of watershed management. Individuals with higher education tend to be more aware of the importance of preserving natural resources and the environment (Waryono & DAS, n.d.). They may also have better knowledge of effective ways to manage watershed sustainably (Kaunang, 2021). Additionally, they have better access to training, meetings, and forums related to watershed management. On the other hand, individuals with low-income face financial limitations and time constraints that hinder their participation in watershed management activities (Satish & Janardhan, 2012) (Kaunang, 2019)

Figure 3
Data of respondent's profession



In Figure 3 above, the data shows the occupations in the Talawaan river basin. The most common occupation in the downstream area is fishermen, while in the upstream area, farmers is the predominant occupation. Other professions include laborers, artisans, entrepreneurs/private sector workers, drivers, traders, sailors, civil servants (PNS), and retired civil servants. It was found that 10 individuals or 5% of the population were unemployed. The choice of occupation among the community can be influenced by their place of residence (Satish & Janardhan, 2012). In the upstream area, which is known for plantations and agriculture, it is not surprising that farming is the main occupation. In the downstream area, which is closer to the estuary and the sea, many people work as fishermen. The location affects the choice of occupation (Dixon et al., 2013) , (Satish & Janardhan, 2012) (Kaunang, 2019). The type of occupation also has an impact on watershed management. From the interviews, it was found that 47% of the community worked in the agricultural and fisheries sectors, which depends on the natural resources from the watershed. Therefore, they have a greater interest in maintaining the sustainability and quality of the watershed. Occupations directly related to the watershed can also provide a better understanding of the importance of good management practices (Stein & Anderson, 2002) (Radjabaycolle & Sumardjo, 2014).

Figure 4
Income of Respondent



Picture 4. Data on Respondents' Income in the Talawaan Watershed, North Minahasa

Figure 4 shows the income of the respondents presented in ranges from less than one million rupiahs to above nine million rupiahs. Based on the values presented: below 1 million (very low), 1-3 million (low), 3-6 million (medium), 6-9 million (high), and above 9 million (very high), it can be observed that the economic condition of the community is mostly in the medium to lower range. 53% of respondents have an income below 1 million rupiahs, followed by the range of 1,000,000 - 3,000,000 rupiahs, then the range of 3,000,000 - 6,000,000 rupiahs, and only three respondents have an income above 6,000,000 rupiahs. Individuals with low income are aware of their financial and time constraints, which limit their participation in watershed management activities (Dixon et al., 2013) (Adam, 2012).

The relationship between education level, income, and environmental management is that higher education and a sense of prosperity in the community can lead to higher or more positive awareness and participation in environmental management (Handayani, 2009). When individuals are provided with knowledge and awareness of sustainable and environmentally friendly practices that can impact their future and the environment, they are more willing to participate without hesitation. The income level of the community can also affect their ability to participate in watershed management activities. Communities with higher incomes may have more resources and access to the necessary technology for effective management. On the other hand, communities with lower incomes are likely to face limitations in accessing resources and technology, which can affect their participation in watershed management (Mulwale et al., n.d.).

CONCLUSION

From the research conducted on the social-economic aspects of the community in watershed area, the following findings are obtained. The education level is higher in the upstream area compared to the downstream area. The most common occupations are farmers in the upstream area and fishermen in the downstream area. The income level is higher in the upstream area and lower in the downstream area. The education level, occupation, and income of the community can influence their attitudes and participation in watershed management

and coastal activities. Communities with higher education, occupations related to watershed and coastal areas, and sufficient income tend to be more active and aware in maintaining the sustainability of watershed and coastal areas.

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