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Water Service Management In Island Communities: Analysis Of Community Participation And Local Policies In Ay Island, Banda, Maluku Province

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ABSTRAK

Penelitian ini bertujuan untuk menganalisis manajemen layanan air di Pulau Ay, Kecamatan Banda, Provinsi Maluku, dengan fokus pada partisipasi masyarakat dan implementasi kebijakan lokal. Penelitian ini menggunakan pendekatan kualitatif dan metode studi kasus. Hasil penelitian menunjukkan bahwa pemerintah lokal telah berhasil mengimplementasikan manajemen layanan air berupa kebijakan yang mencakup perencanaan, pengorganisasian, pengarahan, dan pengawasan dalam mengelola sumber daya air di wilayah Pulau Ay. Dalam konteks perencanaan, identifikasi sumber air potensial, alokasi sumber daya, dan pengembangan infrastruktur air menjadi fokus, menunjukkan keseriusan dalam memastikan ketersediaan air untuk pertanian dan kebutuhan masyarakat. Selanjutnya, peran vital partisipasi masyarakat dalam pengelolaan air di Pulau Ay dari tingkatan yang lebih rendah hingga tingkatan yang lebih tinggi dalam Tangga Arnstein, yaitu non-participation level, tokenism level, dan citizen control level, perkembangan tersebut mencerminkan transformasi yang positif dari keterlibatan simbolis menuju pemberdayaan penuh masyarakat dalam pengambilan keputusan terkait air. Dengan praktik menampung air hujan dan pembangunan bendungan air, Pulau Ay mewujudkan konsep keberlanjutan yang mencakup aspek ekologis, ekonomis, dan sosial, menciptakan model pengelolaan air yang dapat menjadi inspirasi untuk wilayah-wilayah kepulauan lain yang menghadapi tantangan serupa, serta menjadi sebuah ketahanan sosial.

ABSTRACT

This research proposes to analyze water service management in Ay Island, Banda, Maluku Province, with a focus on community participation and the implementation of local policies. The study employs a qualitative approach and a case study method. The research findings indicate that the local government has successfully implemented water service management through policies covering planning, organizing, directing, and supervising in managing of water resources in the Ay Island region. In the context of planning, the identification of potential water sources, resource allocation, and the development of water infrastructure come to be the main focus, demonstrating a commitment to ensuring water availability for agriculture and community requirements. Furthermore, the crucial role of community participation in water management in Ay Island, progressing from lower to higher levels on Arnstein's ladder, namely non-participation level, tokenism level, and citizen control level, reflects a positive transformation from symbolic involvement to full empowerment of the community in water-related decision-making. Through practices such as rainwater harvesting and dam construction, Ay Island embodies the concept of sustainability, encompassing ecological, economic, and social aspects, creating a model for water management that can serve as inspiration for other island regions facing similar challenges, and become a social resilience.

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INTRODUCTION

Maluku, one of the provinces located in eastern Indonesia, is an archipelago area that is rich in natural beauty, biodiversity, and cultural heritage. Despite its abundant natural resources, the province faces serious challenges related to water supply. As it is informed, water comes as a basic necessity for human life and livelihoods that requires to be sustainably managed for various purposes to meet the community's basic needs (Irnani, 2016). The utilization of water resources for various purposes, on one hand, continues to increase from year to year, as a consequence of population growth and the development of activities. On the other hand, the availability of water resources is becoming increasingly limited and tends to be scarce (Septiani, 2018).

Many areas in Maluku Province, such as Bula, East Seram, Kisar, Lakor, Moa, Serwaru, and especially the Kei Islands, particularly on Dullah Island within the island regions, suffer from a severe lack of clean water sources (Koritelu, 2023). This phenomenon is inseparable from the impacts of global climate change, which has increased the intensity and frequency of extreme weather conditions in the region. Irregular rainfall, long periods of drought, and changes in rainfall patterns have led to difficulties in meeting water needs, especially for agriculture, daily life, and industrial requirements (Marttunen et al., 2022).

Ay Island is a village and island in the Banda, Central Maluku. The island is located west of the Banda Islands and is one of the excellent snorkeling spots in the Banda Sea. The soil structure on Ay Island is composed of coral reefs so that it is very difficult for the people of Ay Island to obtain clean water. Clean water is needed by humans to ensure their survival. This is because humans not only need water for their body's needs, but for various other needs such as washing, cooking, and others (Harling, 2020). Clean water is a rare and exclusive item in the village of Pulau Ay. So far, to obtain clean water, the people of Ay Island have had to collect rainwater as a supply of clean water. In the dry season, the shortage of clean water requires that the people of Pulau Ay village supply clean water from Banda Neira by using a longboat for 2 hours The water found in the Banda Islands is in the form of sea water as much as 90%, while the rest is in the form of ground/land water and rain. Seawater is water that has an average salt content of 35%, meaning that in 1 liter (1000 ml) of seawater there are 35 grams of seawater salt (Bahalwan et al., 2022).

Previously, agriculture on Ay Island was highly affected by the uncertainty of water supply. Farmers on the island relied on rainfall as the primary source of water for their crops. The uncertainty in rainfall patterns has created challenges in crop planning and maintenance.

Although water scarcity challenges emerge, Ay Island has successfully maintained high agricultural productivity and has never experienced significant crop failures. This success can be attributed to effective water management. A deep understanding of local climate and soil conditions, coupled with the implementation of water conservation practices, has been the key to ensuring food security on the island.

The community of Ay Island, grappling with uncertain water supply, has developed innovative strategies to enhance agricultural resilience and their overall livelihoods. One notable strategy is the practice of harvesting rainwater and constructing water reservoirs. The local community recognizes the crucial value of rainwater as a resource that can be utilized to address the uncertainty of water supply during dry seasons. By building various reservoirs and water storage ponds, they can capture and store rainwater during the wet season for use during periods of drought.

The local government on Ay Island also actively contributes to supporting these strategies. They involve the community in water reservoir construction projects as part of a collaborative effort to manage water resources sustainably. Outreach programs and training initiatives are implemented to enhance the community's understanding of effective water storage techniques and the importance of collaboration in achieving common goals related to water resource management (Fauzi et al., 2023).

The effects of these strategies are evident in the increased availability of water for local agriculture and daily needs. Farming on Ay Island has become more self-reliant and less dependent on uncertain rainfall. Moreover, with preserved water sources, the community of Ay Island has improved its food security, reducing the risk of crop failures due to water shortages during the dry season. Thus, the practices of harvesting rainwater and building water reservoirs on Ay Island not only serve as innovative solutions to address water challenges but also exemplify how collaboration between the community and local government can bring about positive changes in agricultural sustainability and daily life.

The research on water service management in island communities on Ay Island, Banda Sub-district, Maluku Province, is based on the urgency to understand how communities and local policies interact in managing water resources in a unique environment. Islands, including Ay Island, often face unique challenges related to water supply and sustainability. The success of practices such as rainwater harvesting and building water reservoirs on Ay Island highlights the importance of active community involvement in water management. This research will further uncover the dynamics of community participation and the impact of local policies in managing water services, providing profound insights into how this interaction can be strengthened to support environmental sustainability and community life on the island. The focus on the island context adds a specific dimension to this research, as the challenges and solutions emerging on Ay Island can offer valuable perspectives for water management in similar island regions in Indonesia and globally.

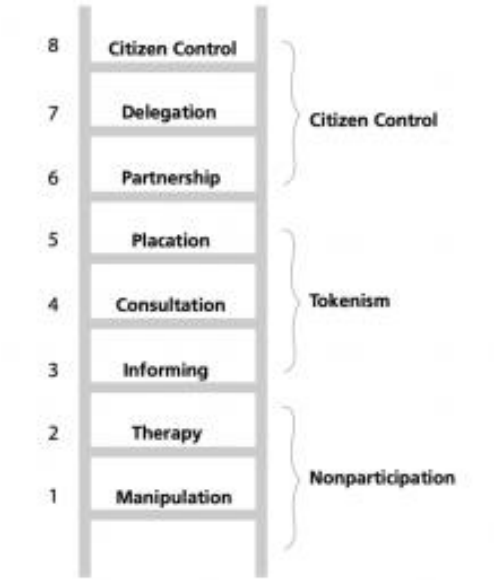
Literature Review

Water service management refers to a comprehensive process that involves planning, organizing, directing, and controlling the provision of clean water to meet the needs of the community. The goal of water service management is to provide quality and adequate clean water services to the public. Several factors influencing the quality of clean water services include operational management, resource availability, and community participation (Agrifa Maser et al, 2017).

The theory of water service management has evolved to focus on inclusivity, achieving sustainable water services for all, enhancing resilience, and protecting the environment. It no longer revolves solely around price regulation but aims to provide good value for money and sustainable water services (Goldman-Benner et al., 2012). This theory recognizes the importance of regulatory bodies in ensuring water service provision and the need for public-private partnerships in managing water resources. Public-private partnerships have been utilized to secure additional funding and reduce government debt, but they have also led to increased water prices after privatization. Water service management goes beyond infrastructure and encompasses aspects such as economics, billing, and customer service. It is crucial to involve both formal and informal institutions in the governance and management of water resources, acknowledging the role of traditional water institutions in community-level decision-making (Mbusa, 2020).

Furthermore, regarding community participation, it is explained that community participation is based on the power of the community to determine a final product and the extent of citizens' power in determining plans and programs (Balram, 2002). Therefore, Arnstein developed the ladder of public participation, and there are generally three degrees of community participation: (1) Non-Participation, consisting of manipulation and therapy; (2) Degrees of Tokenism, comprising information, consultation, and placation; (3) Degrees of Citizen Powers, consisting of partnership, delegated power, and citizen control (Arnstein, 1969).

Figure 1.
Degrees of Citizen Participation



Source: Arnstein's Ladder (1969)

The Arnstein Ladder, proposed by Sherry Arnstein, presents the concept of community participation as a series of levels reflecting the degree of involvement of citizens in the decision-making process. Essentially, this ladder highlights that effective participation is not just about involving the community symbolically but rather empowering them with real influence over policies and projects that affect their lives. At the lowest level, non-participation, the community has no influence, and participation is merely symbolic or limited, as seen in tokenism and consultation stages that do not have a substantive impact on decisions (Wicaksono, 2019).

Arnstein emphasizes that meaningful participation involves citizens as active partners in the decision-making process. In the context of this ladder, higher levels of participation, such as partnership, delegated power, and citizen control, create dynamics where power shifts from the center to the community. Ultimately, community participation is not just about providing information or consultation but recognizing the need to empower the community as an integral part of a healthy democratic system (Skidmore et al., 2006).

Various previous studies have been conducted, including: First, a study titled "Tampayang Innovation as a Seawater Purification Tool in Pulau Ay Village, Banda District, Central Maluku Regency" (Bahalwan et al., 2022), this study aimed to innovate in purifying seawater into drinking water in Pulau Ay village and testing the quality of the water produced. This research was conducted by designing a seawater purification device called

Tampayang (Pulau Ay drinking water station) consisting of a water storage barrel, a simple filter, seawater distillation apparatus, and reverse osmosis (RO) membrane machine. The water produced from seawater distillation was then analyzed in the laboratory according to Indonesian national standards and the Ministry of Health regulation of 2010 regarding drinking water quality requirements. The results showed that the Tampayang tool produced 2 types of water, namely clean water and drinking water. After being tested, both types of water met the quality requirements for consumption based on physical, chemical, and biological parameters. The clean water and drinking water produced can be useful and consumed by the residents of Pulau Ay as a solution for seawater utilization.

Second, a study titled "Management of Clean Water Services in Maropokot Village, Aesesa District, Nagekeo Regency, East Nusa Tenggara Province" (Mbusa, 2020), this study aimed to determine the management of clean water services by the Regional Water Company (PDAM) in meeting the needs of the community in Maropokot Village, Aesesa District, Nagekeo Regency, East Nusa Tenggara Province. The results showed that the management of clean water services by PDAM includes four indicators; (1) planning at PDAM Nagekeo has been carried out well, but there are still some budget issues where the available funds cannot meet the needs, especially in efforts to expand the piping network; (2) implementation conducted by PDAM Nagekeo through socialization and regular meetings by PDAM officials who visit each village; (3) coordination through the organizational structure chart enables the identification of tasks and authorities of each employee; (4) resolution has been carried out by PDAM Nagekeo through two types of supervision, preventive supervision and repressive supervision.

The difference of this research from other research is that this research brings innovation by combining two theoretical frameworks, Water Service Management, and the Arnstein Ladder, to provide profound insights into how water management in Ay Island, Banda Sub-district, Maluku Province, can be enhanced. By utilizing the concepts of Water Service Management involving planning, organizing, directing, and controlling, this study will examine how the application of these management principles can support the effectiveness of water service provision in island regions. Meanwhile, through the lens of the Arnstein Ladder, this research will also analyze the level of community participation in decision-making processes related to water management, ensuring that the Ay Island community is not just a recipient of services but an active partner in shaping policies and practices related to their water resources. With this holistic approach, the research has the potential to provide a comprehensive understanding of how to integrate effective water management with strong community participation, thereby improving the sustainability of water services and the well-being of island communities (Khwaja, 2004).

RESEARCH METHODS

This research aims to obtain a profound understanding of how water service management unfolds in island environments. A qualitative approach and case study method are employed to depict the local context and dynamics of interaction between the community, local policies, and water resource management (Creswell, 1994). This research was conducted on Ay Island, Banda sub-district, Central Maluku Regency from March to July 2023.

The primary data collection techniques used by the researcher are observation and interviews. The researcher conducted observations by taking several field notes during the observation, positioning himself as an observer, and analyzing the actual conditions in the field. Meanwhile, interviews were conducted by asking informants several semi-structured questions. To obtain

secondary data, researchers conducted documentation studies by studying various documents, research, and websites relevant to the research.

Firstly, this research will explore the planning, organizing, directing, and controlling aspects of water service management on Ay Island. Through qualitative analysis, the study will identify the roles of local government, institutions, and the community in planning and implementing water-related policies. This includes an assessment of the success or obstacles in carrying out these management functions, which can provide a foundation for improving the water management system in the region. Furthermore, the research will utilize the Arnstein Ladder approach to analyze community participation in decision-making regarding water services. The case study method will enable this research to illustrate how the Ay Island community is involved in decision-making processes, whether such participation is tokenistic, consultative, or genuine. The focus will be on understanding the extent to which the community influences managing local water resources and whether such participation supports the sustainability of water services on the island.

The data analysis techniques used in this research include data reduction, data display, and verification. Data reduction is done by sorting relevant data, focusing on essential things, searching for themes, and finding patterns. Data display is done by systematically understanding and compiling the data obtained to obtain an overview of the problem or situation. The presentation of data in qualitative research is usually in the form of narrative text, making it easier to understand what happened and design further work based on what has been understood. Conclusion/verification is the process of drawing conclusions, which are new findings that have not previously existed. Findings can be in the form of a description or picture of an object that was previously still vague or dark so that after examination, it becomes clear.

After obtaining data that is considered valid by the researcher, the researcher must then carry out a validity test on the data. The strategy chosen by researchers in this study is triangulation. Triangulation can improve understanding of complex phenomena, where agreement between multiple sources confirms their validity. This research will use the triangulation strategy by utilizing data sources. Researchers tested the validity of the data obtained by comparing data obtained through observation, interviews, and documentation studies. Besides, the researcher will also compare the results of interviews between informants until the researcher obtains saturated data. By using a triangulation strategy of data sources, researchers assume that the data from the analysis can have higher validity. To ensure accurate or valid research results, researchers also conducted regular interviews with the same informants to verify the accuracy of the interview data obtained by previous researchers.

The results of this research are expected to contribute to a deeper understanding of the relationship between water service management and community participation this includes local policies in the island context. These findings may serve as a basis for recommending improvements in the implementation of policies and water management practices, to enhance the availability and sustainability of water services in island communities such as Ay Island, Banda Sub-district, Maluku Province.

RESULTS AND DISCUSSIONS

Water Service Management and Local Policies on Ay Island

The research findings related to Water Service Management on Ay Island, Banda Sub-district, Maluku Province, provide a profound understanding of the implementation of local policies encompassing planning, organizing, directing, and controlling the management of water resources in the island region (Tuong & Bouman, 2000).

1. Planning

In the context of planning, it was found that the local government on Ay Island has implemented planning strategies focusing on water availability for agriculture and community needs. This planning includes the identification and mapping of potential water sources, resource allocation, and the development of water infrastructure in line with the characteristics of the island.

The agricultural productivity remains stable after the implementation of water-focused planning strategies. Additionally, a survey conducted by the village government indicates community satisfaction with access to water, with 70% of respondents reporting improved access to clean water for domestic needs compared to previous years. These statistics highlight the effectiveness of integrating water-focused planning approaches in addressing agricultural and community water needs on Ay Island.

2. Organizing

Regarding organizing, the findings indicate a close collaboration between the village government, Saniri (Village Representative Council), and the local community in forming a group responsible for water management on Ay Island. According to information from local village officials, this collaboration has proven to have a positive impact on the availability of clean water and sustainable water resource management.

This institution not only acts as a regulator but also serves as a platform for active community participation in environmental conservation efforts. The existence of such institutions represents a progressive step in addressing global and local environmental challenges and can serve as an example for other regions facing similar issues.

3. Directing

The direction of local policies related to water management on Ay Island appears to involve active community participation. The presence of consultation forums and meetings between the government and the local community provides a platform for the exchange of ideas and needs related to water management. This strategy creates a platform for the residents of Ay Island to contribute to decision-making related to water policies, resulting in more inclusive and responsive policies to local needs.

Furthermore, data collected from these forums and meetings can provide valuable insights into the specific challenges and priorities of water management on the island. For example, interviews conducted during various consultations reveal information about water usage patterns, the prevalence of water-related issues such as scarcity or contamination, and the effectiveness of existing infrastructure and initiatives. By integrating such data into the policymaking process, the village government develops and formulates more effective strategies to address the unique circumstances of Ay Island, ensuring sustainable and equitable water management practices for the community.

4. Controlling

At the controlling level, the findings show that the local government on Ay Island has implemented an effective monitoring system for water management. This monitoring includes the assessment of water quality, the amount of water used, and efficiency in the use of water resources. With rigorous monitoring, the government can identify potential issues early on and respond quickly to maintain the sustainability of water management.

Despite facing water difficulties, Ay Island has successfully maintained high agricultural productivity and has never experienced significant crop failures. These findings indicate that the water management strategies on the island have successfully addressed environmental challenges. One notable strategy is the harvesting of rainwater and the construction of water reservoirs, along with irrigation systems such as drip irrigation and precision-based irrigation, which have helped optimize water usage, reduce waste, and enhance agricultural efficiency on Ay Island.

In addition, the adoption of drought-resistant crop varieties adapted to changing climate conditions also becomes a key strategy. Research and development of plant varieties suitable for the environmental characteristics of Ay Island help farmers cope with weather uncertainties and enhance agricultural resilience. In the coconut plantation sector, the findings indicate that the effective implementation of water management has a positive impact on coconut production. A well-designed irrigation system helps ensure an adequate water supply for coconut plants, which require stable environmental conditions.

For crops like cashews, cloves, and nutmeg, research results show that the adaptation of plant varieties suitable for the environmental conditions on Ay Island plays a crucial role in improving productivity. Plant varieties that are more resilient to dry and extreme climate conditions help minimize the risk of crop failure. Moreover, active community participation in adopting sustainable farming practices can also have a positive impact on the yields of these plantations.

Active community participation in water management also stands as a pillar of success (Balram, 2002). Education and training programs have raised awareness among the community about the importance of water conservation and sustainable farming practices. The Ay Island community is not just a recipient of water services but also an active partner in maintaining the balance between water supply and consumer needs. This success can also be attributed to local policies supporting sustainable water management initiatives. Investments in water infrastructure, climate monitoring, and early warning systems have strengthened resilience to ongoing climate change (Pangeran, 2012).

Overall, the research findings provide an overview that the success of water service management on Ay Island is not solely based on robust local policies but also involves active community participation, the application of appropriate technology, and adaptation to climate change. The experience of Ay Island can serve as a model for other regions facing similar challenges in managing water resources and achieving agricultural sustainability.

The theory of water service management, in the context of this research, serves as the conceptual foundation guiding the analysis of Ay Island's local policies related to planning, organizing, directing, and overseeing the management of water resources. The concept of planning emphasizes the importance of setting clear goals for water management, identifying potential water resources, and mapping supporting infrastructure. This theory also highlights the need for efficient and sustainable allocation of resources to ensure an adequate water supply for agricultural and community needs (Otieno, 2019).

In terms of organization, the theory of water service management helps understand how coordination among involved parties, such as local government, institutions, and the community, can be efficiently managed (Mbusa, 2020). The formation of organizations or groups responsible for water management on Ay Island reflects the implementation of organizational principles to ensure the involvement and contribution of all stakeholders. This concept also underscores the importance of clear roles and shared responsibilities in managing water resources.

In directing, the theory of water service management provides insights into how community participation can be integrated into decision-making and water management processes. The success of implementing local policies involving active community participation can be analyzed through the lens of this concept. The implementation of consultation forums and meetings between the government and the local community aligns with this theory, resulting in more inclusive water policies tailored to local needs. This concept also recognizes the importance of ensuring open and transparent communication channels among stakeholders (Madubun, 2023).

By applying the theory of water service management, this research not only analyzes the implementation of local water policies but also provides a strong theoretical foundation for understanding how effective water management can be realized in island contexts like Ay Island. The integration of this theory provides a cohesive framework for evaluating various aspects of water management, helps identify potential areas for improvement, and contributes to conceptual thinking in the field of water resource management.

Community Participation in Water Service Management

This research describes findings and discussions related to community participation in water management, focusing on rainwater harvesting practices and dam construction on Ay Island, Banda District, Maluku Province. In the context of Arnstein's Ladder of Participation theory, these findings provide insights into the extent of the Ay Island community's involvement in decision-making and the implementation of water management practices.

1. **Non-Participation Level**

At the first level of Arnstein's Ladder, namely non-participation or manipulation, the findings indicate that the Ay Island community previously had limitations in decision-making regarding water management. Decisions were often made without consultation and community participation, creating uncertainty and a lack of sustainability in water management practices. However, over time, a significant shift towards higher levels of participation occurred.

The available information indicates that these changes are driven by a push to improve quality of life and the environment, as well as an awareness of the importance of community participation in decision-making processes. The first step in this change is to enhance community access to information related to water management, both through outreach efforts and the provision of easily accessible documents. With more transparent information, communities become more engaged and feel a greater stake in water management issues.

Furthermore, significant changes are also evident in the level of consultation conducted by decision-makers. Previously, consultation with the community was merely symbolic and not considered crucial in the decision-making process. However, with an increased awareness of the importance of community participation, decision-makers have begun actively involving communities in discussions and consultations regarding water management. This allows for more open and sustained dialogue between stakeholders and the community, ensuring that decisions reflect shared interests.

Moreover, to achieve higher levels of participation, placation measures are also necessary in the decision-making process concerning water management. This includes concrete efforts to involve communities in the implementation of water-related policies and programs. For example, decision-makers can encourage community participation in environmental preservation and restoration projects, as well as provide technical and financial support for community initiatives. Thus, communities are not only invited to provide input in the decision-making process but also empowered to take tangible actions that impact water management as a whole.

2. Tokenism Level

At the tokenism level, the Ay Island community began receiving information about water management plans and policies, but their participation remained symbolic. Nevertheless, steps towards inclusivity and greater involvement in decision-making processes related to water management were already evident. Active education and training programs were encouraged to enhance the community's understanding of rainwater harvesting practices and dam construction.

At the consultation level, community participation became more apparent with the existence of discussion forums and meetings between local government and residents (Indriani et al., 2021). This process created space for Ay Island residents to voice their aspirations and needs regarding water management. Although policies sometimes remained less responsive to community input, this dialogue marked a significant shift towards more genuine participation.

Stepping into the next level, namely placation or concession, the community of Ay Island began to receive recognition for their contributions to water management. The local government responded positively to community input, and policies supported the principles proposed by residents regarding rainwater harvesting practices and dam construction.

3. Citizen Control Level

At the partnership level, the Ay Island community became more involved in the planning and implementation of water management policies. This process created a more equal relationship between local government and the community, with active involvement in decision-making and joint actions. The success of rainwater harvesting practices and dam construction became more apparent with strong collaboration between the government and the community. By reaching the level of delegated power, the Ay Island community gained greater authority in managing local water resources. They were involved in monitoring and direct oversight of water management practices, enhancing their control over policies related to local needs.

At the citizen control level, the Ay Island community has reached the pinnacle of genuine participation in water management. They have full control over decisions and actions related to water in their area. This creates conditions that support the sustainability of rainwater harvesting practices and dam construction.

The discussion highlights that the increasing community participation in water management on Ay Island has created an environment that supports the sustainability of water resources and agriculture. Rainwater harvesting practices and dam construction become more effective by involving local knowledge and meeting community needs, which, in turn, support local food security and the economy. This success indicates that integrating community participation in water management can positively contribute to the sustainability of water management and agriculture on Ay Island. The increasing community participation brings significant changes in

decision-making dynamics, from merely receiving information to active involvement in formulating policies relevant to local needs (Ramdhan, 2016) (Fraser, 2005).

Figure 2.
Construction of Water Dam to Harvest Rainwater

Source: Author (2023)

With the practice of rainwater harvesting and the construction of water reservoirs, the community of Ay Island has become not only recipients of water services but also stakeholders with a significant voice in the efforts to manage water resources. The success of these practices also reflects the community's adaptation to the arid environmental conditions of Ay Island by implementing local solutions that suit their needs.

Figure 3.
Collaboration between Local Government and the Community

Source: Author (2023)

In the levels of partnership and delegated power, there is a strong collaboration between the local government and the community. Empowering the community in decision-making and direct supervision strengthens the bond between the community and the government (Madubun & Madubun, 2023) (Wibowo & Belia, 2023). Such collaboration creates more sustainable policies by combining local knowledge with the technical resources possessed by the government (Ufi et al., 2023).

At the level of citizen control, the community of Ay Island has achieved full control over water management in their area. This illustrates the implementation of stronger democracy in decision-making related to water, where policies reflect the aspirations and real needs of the

community. The community not only participates in implementation but also has direct responsibility for the sustainability and balance of water resources on Ay Island.

In terms of agricultural sustainability, the results and discussions highlight that local policies involving active community participation in water management have a positive impact on agricultural outcomes, including the production of vegetables and crops such as coconuts, walnuts, cloves, and nutmeg. The adoption of efficient irrigation technology and the adaptation of plant varieties suitable for the island's environmental conditions have increased agricultural productivity. Similarly, community participation in the monitoring and maintenance of local water infrastructure has helped maintain an adequate water supply.

CONCLUSIONS

Based on the analysis and discussion above, the following conclusions can be drawn: (1) The local village government has successfully implemented water service management in the form of policies covering planning, organization, direction, and supervision in managing water resources in the Ay Island region. In the context of planning, the identification of potential water sources, resource allocation, and water infrastructure development are the focus, demonstrating seriousness in ensuring water availability for agriculture and community needs; (2) The vital role of community participation in water management on Ay Island from lower to higher levels in Arnstein's ladder, namely non-participation level, tokenism level, and citizen control level, reflects positive transformation from symbolic involvement to full empowerment of the community in water-related decision-making. Through rainwater harvesting practices and the construction of water reservoirs, Ay Island embodies the concept of sustainability encompassing ecological, economic, and social aspects, creating a model of water management that can inspire other regions facing similar challenges. This is part of the social resilience that must be supported and developed sustainably.

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