Pak. j. life soc. Sci. (2025), 23(1): 8885-8897 E-ISSN: 2221-7630;P-ISSN: 1727-4915

Pakistan Journal of Life and Social Sciences

www.pjlss.edu.pk

https://doi.org/10.57239/PJLSS-2025-23.1.00693

RESEARCH ARTICLE

Implementation of Sustainable Irrigation System Governance Policy in Rotiklot Watershed, Belu District-Indonesia

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ARTICLE INFO

Received: Mar 20, 2025

Accepted: May 12, 2025

Keywords

Rotiklot River Basin
Implementation
Policy
Sustainable Irrigation
Governance

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ABSTRACT

This research aims to describe and analyze the implementation of sustainable irrigation system governance policies in the Rotiklot River Watershed and identify supporting and inhibiting factors through the Goggin et al. Implementation Model. This research is descriptive research with a qualitative approach. The results showed that the Implementation of the Sustainable Irrigation System Governance Policy has been running as follows: (1) Structuring the water allocation mechanism at the watershed scale, (2) Patterns of implementing integrated and sustainable management to optimally utilize available water resources from Rotiklot dam (3) Irrigation excellence characterized by a focus on the water allocation mechanism and the effectiveness of integrative management. (4) Utilization of superior and advanced irrigation techniques, namely SPRINKLER, as appropriate technology. This research formulates the "Integration Model" as a policy implementation model for sustainable irrigation system governance in Rotiklot Watershed, Belu Regency, and East Nusa Tenggara Province, Indonesia. Sustainable irrigation system governance is a form of policy implementation in managing water resources to meet various environmental and community requirements, such as agriculture, plantations, fisheries, and livestock that require professional and independent management to improve overall community welfare.

INTRODUCTION

Water is an absolute necessity for the survival of humans, animals, and plants. Almost all daily human activities require water as a primary or supporting material, including in the industrial sector, domestic needs, clean water, and agriculture. The human need for water is increasing from time to time. Before the reformation century, various programs implemented by the government had shown spectacular success, especially the political independence of the Indonesian people, who had been free from the shackles of colonialism for approximately four centuries. On the other hand, economic and social independence has yet to be fully realized for the community due to the low ecological capacity that supports the state's capacity to implement socio-economic development with the government. Development has not been equitable, so people throughout Indonesia have yet to enjoy it fully. Water scarcity, food shortages, and artificial energies, especially in East Nusa Tenggara, including Belu Regency, have only received proper and adequate handling by the reform order government in the last decade.

Various causal factors are identified to encourage and control efforts to fulfill the basic needs of clean water, food, and renewable energy at both the central and regional levels, in addition to the factors of decision results and state capacity, state implementation and feedback, and policy redesign. The fundamental thing behind the research on the implementation of sustainable irrigation system governance policies is a matter of knowing and doing based on the opinions of scientists supported by the results of previous research. The basic assumption is the importance of a broad and in-depth understanding of the substance and dynamics of implementation in a

scientific and integrated manner that will affect the overall achievement of results. The constellation of the existence and role of the state and government as public institutions and public figures of water resources are related to the interests of many people, which must be regulated and managed correctly. Water management governance becomes relevant and strategic due to the commonalities of water as common goods or shared (social) property. This phenomenon places the government or state in a critical role by involving various elements representing the state. Here the state is understood as an authentic collection of various national and local political subsystems. (Douglas Rose, 1973: 1170) in Implementation Theory and Practice by Malcolm L Goggin et al., "States Are A Real Collection of Various Subsystems of National and Local Politics.") In concrete form, the comprehensive meaning of the state is known as the legislature, executive, and judiciary, which at the operational level are politics, bureaucracy, and organized interest groups. To a certain degree, these three units of relationships or clusters at all levels of government are with the government from the beginning of program planning, the implementation process on an ongoing basis to the output and outcome.

The term sustainability attached to the subject of irrigation system governance is specific because, at a certain level, it is related to the failure of handling that occurred previously or missed management. The phenomenal development showed the reconciliation of knowledge and power accumulated in the executive structure of the government by involving many institutional parties and the business world in accelerating social change. The dynamization of the priority scale of meeting the basic needs of the majority of economically weak, underdeveloped, and remote rural communities is carried out through spectacular infrastructure development, including water dams for clean water consumption and irrigated agriculture development, transmitted through the construction of superior multipurpose irrigation infrastructure at Rotiklot dam, one of the dams built in East Nusa Tenggara Province.

Thus, the Implementation of a Sustainable Irrigation System Governance Policy, which is the topic of this research, is part of an effort to solve the main problems of the people of Belu district, namely water scarcity, food shortages, renewable energy deficits, water utilization for irrigated agriculture, flash flood control and watershed ecosystem instability. Policy direction on the continuation of ecological, economic, and social factors under integrated water resource management, or called Water Governance.

The disharmony of paradoxical relationships between ecological, economic, social, and political aspects of the environment has led to ecological insecurity characterized by water scarcity, increased global warming, and food shortages. The development of water resources has not yielded meaningful results or benefits for the community due to the solid sectoral interests in the ministries related to water management, namely the Ministries of Forestry, Environment, Public Works, Finance, Ministry of Home Affairs, Ministry of Agriculture, and Ministry of Villages. A Dutch scientist, Snellen, researched the government's top-down approach and its effects on the country. The results of Snellen's research pointed to the failure of the sectoral approach or top-down management during the Dutch colonialism in the colonies, including Indonesia. Intergovernmental Policy Implementation refers to conceptualizing implementation at the state level as a process with its products, namely outputs and outcomes resulting from the state's choices. The implementation behavior of the state is a function of the encouragement and constraints that the state must face in various lines, from above, from below, and from the side, in line with the state's desire to act according to its capacity in realizing the programs implemented. Encouragement is the factor that stimulates implementation, while constraint is the opposite. It is recognized that no single factor can explain variations or differences in implementation. State responses to federal/union nudges and constraints differ, depending on the nature and intensity of preferences of critical participants, including local-level agents in the state policy formulation process.

Implementation of the Sustainable Irrigation System Governance Policy describes the sustainable development goals (SDGs) at Rotiklot Dam, Belu Regency. The term sustainability in this paper's title contains important meanings in Law Number 17 of 2019 concerning Water Resources,

paragraph 15 concerning Utilization of water resources, and paragraph 17 concerning Control of water damage. The essence of the three is the regulation of water resources, which aims to (1) Provide protection and ensure the fulfillment of the people's right to water; (2) Ensure the sustainability of the availability of water and water sources in order to provide benefits fairly for the community; (3) Ensure the preservation of the function of water and water sources to support sustainable development; (4) Ensure the creation of legal certainty for the implementation of community participation in supervising the Utilization of water resources, starting from planning, implementation, and evaluation of Utilization; (5) Ensure the protection and Empowerment of communities, including indigenous peoples in efforts to conserve water and water resources; (6) Control water destructive power as a whole, which includes prevention, Control, and recovery (Article 3, Law Number 17 of 2019).

The specifics of Rotiklot dam management are multifactorial because it is categorized as a local watershed but national and international in scale due to the breadth and coherence of the relationship between Indonesia and Timor Leste. The Rotiklot Dam is categorized as a national strategic program in this context. This specific categorization is based on policy patterns and plans such as those contained in Government Regulation Number 37 of 2012 concerning Watershed management, Law Number 17 of 2019 concerning Water Resources contained in Article 22 paragraph 1, stating internal linkages between surface and groundwater use sectors, inter and intergenerational linkages, intra and inter-regional linkages in terms of non-administrative water ecology. The importance of the principle of sustainability is further stated as water resources management is carried out in a comprehensive, integrated and environmentally sound manner to realize sustainable water benefits for the greatest prosperity of the people. The Utilization of water resources is intended to utilize water resources sustainably with the main priority of fulfilling water needs for the community.

The principle of sustainability is also expressed equivalently in the same sense, namely maintaining the continuity of the functions and benefits of water and water sources in a sustainable manner, which characterizes the governance of irrigation systems, which means water institutions and, at the same time functions to manage irrigation systems. Irrigation network management is the maintenance and operation of irrigation networks in irrigation areas. The irrigation system is a unity of primary, secondary, and tertiary irrigation systems, including the reliability of irrigation water supply, irrigation infrastructure, irrigation management, and human resources. Irrigation system governance manages water and water resources in a unitary area based on the river area. In this constellation, the Rotiklot dam in Belu Regency is a sub-region of the Benenai River which covers four districts, namely South Central Timor Regency, North Central Timor Regency, Malaka Regency, and Belu Regency, according to the Decree of the Minister of Public Works and Public Housing Number 243, 2020 concerning the Management Pattern of Water Resources for the Benenai River area.

The low economic scale category at Rotiklot dam still cannot meet the overall water needs in Belu Regency, in the sense that it must prioritize the fulfillment of basic needs through water storage in the form of reservoirs and dams to overcome water scarcity, prevent flood hazards, and meet food needs. (Food estate) Moreover, irrigated agriculture is in stages. The main principle is to gradually direct its sustainability on the scale of time, breadth, and coherence, starting from the local scale of the micro-hydro river basin.

The choice of water resources management strategies is Conservation of water resources, utilization of water resources, control of water damage, systematization of information, and Empowerment and improvement of the role of water institutions. The basic assumption for sustainable development under the Control of water institutions or local irrigation system governance is local water resources management of micro-watershed patterns at Rotiklot dam.

Public administration, as an interdisciplinary science and a study of public policy, legitimizes the functions and authority of the state in making any decision as long as it concerns the public interest. In this regard, water, as a source of life for humans and living beings and as common goods, falls within the domain of state assignment and management as a representation of

popular sovereignty. Douglas Rose, 1973: 1170, defines the state, appointed by Goggin et al., 1995 in a book entitled "Implementation Theory and Practice: States. "States are natural collections of various sub-systems of national and local politics. States are natural collections of various subsystems of national and local politics. This definition justifies the paradigmatic assumption that various national and regional interests concern resources that must be managed jointly by the government, the community, and the business world as a unit. Water Resources Law Number 17 of 2019 on water resources is a concrete and consistent manifestation of the 1945 Constitution Article 33 paragraph (3) and paragraph (2). However, when traced back, there have been gaps, both empirical, theoretical, and normative, as reported above, due to inconsistencies with the spirit and soul of the 1945 Constitution.

Technical data on agricultural irrigation performance based on the 2020 SIPD evaluation of the PUPR Office noted that irrigation development at the provincial and district levels has not been optimally served in 24 irrigation areas covering an area of 1,243.18 ha due to technical and non-technical damage to channels including the Haekesak irrigation area covering an area of 4,400 ha, which is the task and domain of the central government. The dominant factors affecting the delay in handling include the existence of order and security disturbances due to the natural hydrogeological conditions of the river basin at the node point of the cross-border between Indonesia and Timor Leste, namely the Talau River basin and the Loes River basin. The existence and role of the Rotiklot dam downstream in the Ainiba irrigation area, in its status as part of the Haekesak irrigation area, is less influenced by security and order factors because the hydrogeological conditions of the water flow do not directly lead to the Malibaka river but flow on the north coast within the juridical territory of Indonesia. Thus, irrigation development runs fast and can even affect the process of accelerating the development of other irrigation areas as a pilot project.

Various disharmonies of paradoxical relationships between and among external and internal environmental factors are wrong policies. In many cases, there is even failure or no implementation of the policies that have been launched. (garbits in, garbits out). The various problems and gaps that occur include (1) Unbalanced rapid population growth with continuously depleting water availability, (2) Extreme climate and rainfall, (3) Global warming pressures, (4) Overexploitation of land forest and water resources through conversion of forestry land into seasonal subsystem farmland or shifting cultivation, (5) Destructive overgrazing of land due to extensive grazing patterns, (6) Low income and purchasing power due to limited capital-intensive activities in the non-agricultural industrial sector, (7) Water policies that are one-sided and not directed towards the realization of people's human rights to water, (8) At the policy implementation stage; it tends not to run smoothly because it is not based on a causal theoretical basis as a Grand Theory, middle theory, empirical theory, and methodological weaknesses as a means of reference for achieving goals or results.

Efforts to solve the problem in the form of formulation, implementation, and monitoring of problem-solving policies by the government are not carried out as they should because the policy targets and objectives do not address the community's basic needs for water and the agrarian agricultural sector, which is the community's main livelihood. The handling of these main problems is only sectoral, with no involvement of other related sectors, both intra-governmental and inter-governmental. The characteristics of handling water resources problems, especially those concerning water in the Watershed category, are so complex that they require the involvement and participation of many parties to plan and solve in an integrated, environmentally sound, and sustainable manner. Some of the main problems identified are (1) Low collective understanding of what implementation is, why it should work better, and how to make it work better. In other words, implementation is oversimplified as something that happens automatically rather than very complex. (2) There is a communication gap between bureaucrats and politicians due to certain motives and interests, such as to avoid Control over the creation and implementation of discretion. (3) The absence of a grand theory that obscures the entire process from policy formulation, implementation, monitoring, and evaluation of results. (4) Overlapping regulations resulting in implementation failure in realizing normative/legal goals

and values. (5) Paradoxical relationship between external and internal factors of water policy; need for understanding of principles, objectives, functions, and authorities in institutional governance or the absence of strong institutions in regulating and managing water resources. (6) Resources (human, financial, social, cultural) are still very limited and have yet to be fully utilized and managed. (7) Stakeholders involved in water resources management have yet to be well identified and have not been maximally involved. (8) Government strategies and policies still need to address the complexity of water resources management issues fully. (9) There is no forum or institution based on collaboration.

Based on the description of these problems, this research was conducted to describe and analyze the Implementation of Sustainable Irrigation System Governance Policies in the Rotiklot River Basin, Belu Regency, by analyzing the supporting and inhibiting factors of Policy Implementation and formulating an appropriate Policy Implementation model in Sustainable Irrigation System Governance in the Rotiklot River Basin, Belu Regency-Indonesia.

LITERATURE REVIEW

Previous research from domestic and foreign journals totals 11 discusses water abundance and scarcity and how to overcome them. The complexity of water problems and the status of water as a public good places the government in an essential position in its management for the benefit of public welfare and justice. However, planning, implementing, and evaluating the performance of water programs must always involve the business world and civil society in the broadest sense as a prerequisite for the program's success and to ensure its sustainability on an extended scale for future generations. The bottom line is how to minimize risks and optimize benefits that include the sustainability of water management from three aspects: ecology, economy, and community. In this relationship, the government is a central public institution.

This past research describes 11 studies on water policy and implementation for various community needs in various countries, including Indonesia. These countries include Mexico, the U.S., Western Europe, Singapore, China and Indonesia. Periodically, the research is limited here to 2019-2020 for the scientific journal category. Of course, it is based on the foundation of science as a result of scientists' research and is relevant to the discipline.

The contemporary development of research articles in the research area, specifically the Rotiklot Watershed in Belu Regency, on the border of Indonesia and Timor Leste, is inseparable from the reference framework of the studies that preceded it. It is adapted to the local situation and conditions that stem from the diversity of each country or region. This research shows differences or gaps between individuals and community groups in various countries or between countries. The phenomenon of water scarcity or water abundance affects each country's policy on water, according to the situation and conditions of availability, governance, and its impact on people's lives. A cursory overview of some countries shows the following circumstances: (1) Singapore consumes water from neighboring Malaysia due to water scarcity because the country has no watershed to manage. Its status is that of a small country or city-state. (2) Another example is that Mexico and its partners, the U.S. and Guatemala, work together to manage cross-country watersheds by applying technological advantages, so there is almost always sufficient water. (3) European Union countries such as the Netherlands, Germany, Portugal, Italy, and France have different water resources, affecting water pricing water policy. The Netherlands and Germany have abundant water, so no water pricing policy exists. On the other hand, Portugal, France, and Italy do not have sufficient water resources, so the government sets a water tax policy for the community. (4) China excels in the irrigated agriculture sector due to scientific and technological innovation and has become a model for other countries to apply, including Indonesia. It is known as the appropriate technology for superior irrigation, called SPRINKLER. A case example of the use of technology in the Rotiklot research area is that after the construction of the Rotiklot Dam, the water source is used for sustainable irrigated agriculture. The unique thing is that the government's existence of the Rotiklot water dam since 2020 has dramatically influenced the lives of some border communities in Belu Regency from ecological, economic, and social aspects. In addition, using the SPRINKLER appropriate technology system as an element of sustainable

irrigation system governance has begun to increase agricultural productivity, current community income, at least at a minimum level, and food availability because water stocks are adequate to be utilized efficiently and effectively.

METHODS

The paradigm of this research is the constructivism paradigm. According to Peter L. Burger and Thomas Luckman (Karman, 2015), the paradigm is a point of view in viewing social symptoms and realities.

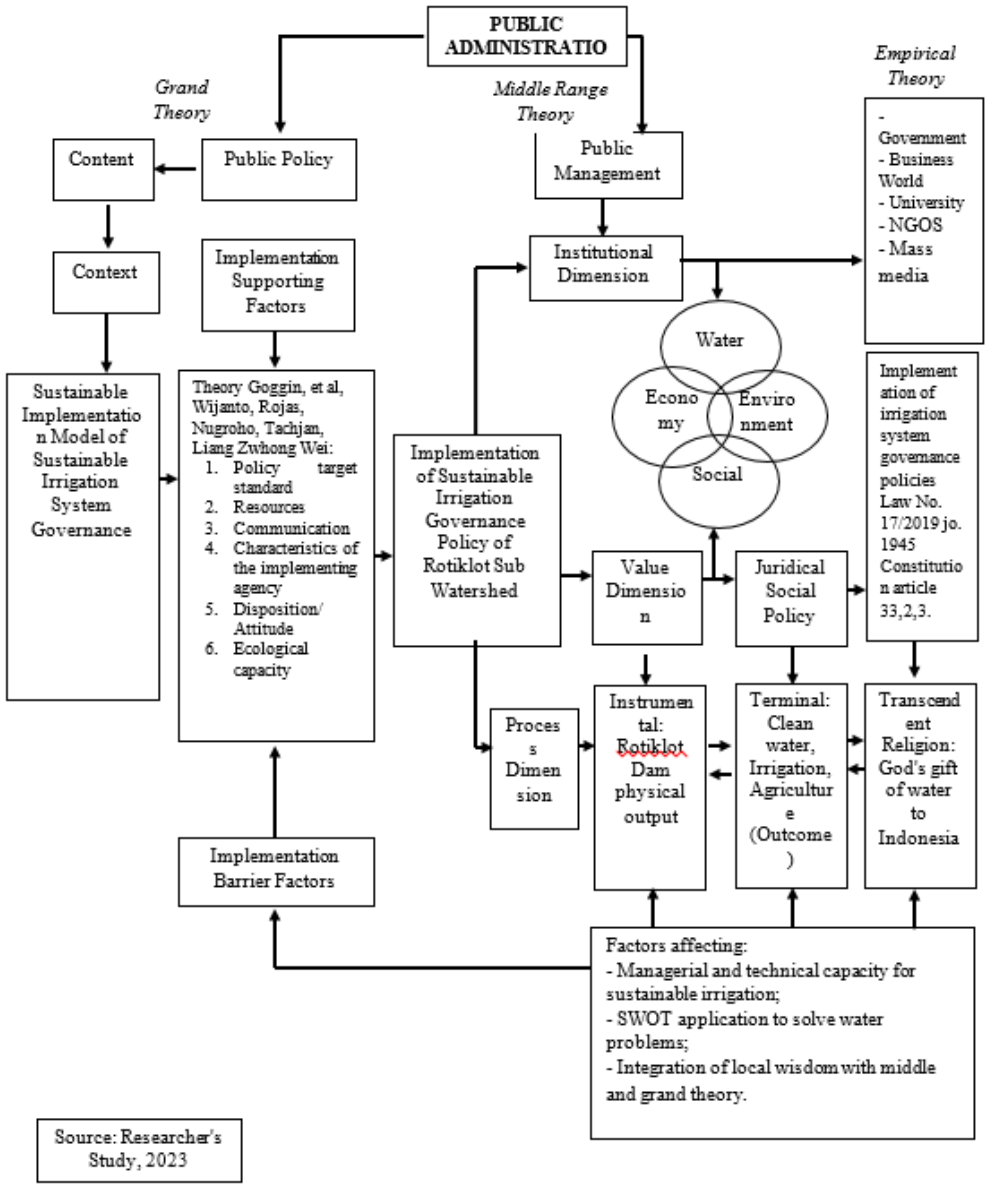
This research approach is a qualitative research approach, which, according to (Anggito and Setiawan, 2018), is to collect the data needed from research sources and then use it to interpret existing phenomena. Here the researcher is the key instrument. Data sources are taken purposely to ensure the achievement of specific goals tested with triangulation (combined) collection techniques. Qualitative data analysis focuses on emphasizing the meaning behind the phenomenon. According to Erickson, quoted by (Anggito & Setiawan, 2018), researchers try to find and describe narratively the activities carried out and analyze the impact of the actions taken. It can be concluded that qualitative research is scientific research that seeks to understand the social aspects of phenomena by building a relationship between researchers and the events happening. Description and analysis use words and language that are specific and natural but do not reduce their academic and normative levels. Observation techniques, interviews, triangulation, or expert panels support the research approach. Research focus and research phenomenon.

Related to the research topic is (1) Analyzing the Implementation of Sustainable Irrigation System Governance Policy in Rotiklot Watershed, Belui Regency, RI-RDTL Border; (2) Examining and analyzing the supporting and inhibiting factors of the Implementation of Sustainable Irrigation System Governance Policy in Rotiklot Watershed: (3) Formulate a model of Sustainable Irrigation Governance Policy Implementation in Rotiklot Watershed, which is found and its recommendations. The type and basis of research are (1) Interpretative, in which natural and engineered meaningful phenomena are described to realize specific goals. In the context of public institutions, these goals are normative, academic, and empiric or natural reality. (2) Case Study is research found in many fields of science, especially evaluation science, where researchers develop an in-depth analysis of a case, program, event, activity, or process of one or more individuals. Cases are limited by time and activity, and researchers collect detailed information using a variety of data collection procedures over a sustained period (Yin, 2012). Data collection techniques in case studies are interview techniques, observation, and examination of documents and artifacts. The selection of participants should be based on their ability to contribute to understanding the phenomenon to be studied, such as perceptions of interactions between students in general and particular education (Fauzy et al., 2022). The data used in this study consisted of primary data and secondary data. Data collection methods are through observation, interviews, and documentation. Data testing is part of research that uses the triangulation method. The credibility test serves as a tool to test the quality of data researchers obtain. Then, the credibility of the data shows that the data obtained by the researcher is based on the facts. There are several ways to achieve credibility: observation, triangulation, and conducting discussions and expert panels obtained according to their views on the object/subject of research. This research uses triangulation techniques and detailed description techniques.

RESULTS

To some extent, the Sustainable Irrigation System Governance Policy has been implemented. However, it has yet to run optimally because it still requires capacity building and competence of local communities and increasing the role of local governments to help implement central government policies about the tasks of assistance and as a tool of deconcentration of the Central Government. The supporting factors are: (a) The existence of regulatory clarity; which is directed at meeting the basic needs of water for the community and irrigated agriculture, with the highest legal source, namely the 1945 Constitution, Article 33 paragraphs 3 and 2. (b) Human resources

that have adequate capacity and competence. It refers to the bureaucracy and third parties (contractors) working on the project. (c) Communication between and among the Ministry of Public Works and other relevant ministries, namely the Ministry of Environment, Ministry of Agriculture, Ministry of Home Affairs, and Foreign Affairs. (d) The government's political commitment, managerial capacity in carrying out its primary task of public welfare, and the technical expertise of implementers in carrying out physical project work in the field. (e) The managerial ability of the Regional Government, in this case, the Regional Planning Agency of Belu Regency and the Fatuketi Village Government, to plan from the bottom for approximately five years. Then, propose a single agenda for constructing the Rotiklot dam to the Central Government. Based on field observations, this phenomenon was encountered in the research field, when examining the performance of planning and implementing institutions at the district level. The competence and moral commitment of the local government, led by the Bappeda institution and the village head, is categorized as reliable since the formulation and implementation of the plan, as well as monitoring and evaluation in the management of Rotiklot dam water resources, on an on-going basis. It is indicated by the interest and determination of the community to protect and maintain and ensure its sustainability. Formal and informal networks or relationships built with planning institutions, implementers, and politicians at the top level, namely the Province and the Center, strengthen optimism for success and sustainability. Goodwill The government prioritizes the fulfilment of the community's basic needs for clean water, food, and energy as an expression of the realization of the human right to AI by Law Number 17 of 2019. Factors inhibiting policy implementation are: (a) The human resources of policy implementers, especially community groups, still need to be improved in knowledge and experience to further develop non-construction programs in the irrigated agriculture sector. (b) Miscommunication often occurs because it relies on one-way communication, namely from top to bottom, communication should be interactive from bottom to top as well. (c) There is a conflict of interest between the bureaucratic implementers and the legislature's role in carrying out the supervisory function over the implementation of the physical works of the project, which needs to be more evident in coordination and cooperation at the Local Government level. (d) Organizational characteristics: Local advocacy institutions have yet to play an optimal role in empowering the community in promoting values concerning the community's interests. So far, it has only been limited to the role of religious and social organizations that play an optimal role in backing up the development of material values concerning the community's basic needs. (e) Conventional sociocultural values that are local are still rooted due to the intense physical and social isolation that has lasted for some time. The model found and proposed for the Implementation of Sustainable Irrigation System Governance Policies on a future scale is the "**Integration Model**," which can unite theory, practice, and values that have the potential to ensure increased achievement of project goals and program objectives successfully and sustainably. Goggin defines integration as the accumulation of top-down and bottom-up approaches in formulating, implementing, monitoring, and evaluating feedback and redesigning toward the development or continuous improvement of program quality.



Integration Model of Sustainable Irrigation System Governance in Rotiklot Sub-watershed, Belu Regency

DISCUSSION

Ecological, economic, and social aspects with details of technical activities in the field related to the use of surface water and groundwater, including transboundary watershed strategies and activities (articles 22-23), but the description also does not ignore the overall overview as a unity of systemic governance of water resources which includes primary, secondary and tertiary irrigation systems, agricultural irrigation water supply, irrigation management and management institutions and human resources as feedback for sustainable irrigation system governance related to Rojas' water policy and finally with the five components of the communication model of Goggin et al. As part of natural resources, water is the core of basic needs for human life and other living things. The regulation of river basins by the state or government as a public institution is relevant to address the needs of many people, including individuals and communities. The constitutional foundation of the 1945 Constitution, article 33, paragraph 3 clearly states that the government should direct the development and Utilization of water for the greatest prosperity of the people. Various local and national

problems, such as water scarcity, food insecurity, energy deficit, global warming, and others, contain economic, ecological, and social dimensions. All of these are accumulated in the fundamental conception of: Sustainable Development.

The purpose of water resources management, as contained in the state constitution, is nothing other than the academic crystallization of sustainable development. Therefore, it is becoming increasingly important to understand the paradigm shift from economic growth alone to eco-development or environmentally sound development. So the following examines whether and to what extent its implementation is by the objectives of water resources management, namely the implementation of the greatest possible prosperity for the people. As mentioned above, the source of reference is five objectives: Conservation of water resources, Utilization of water resources, Control of water destructive power, Water resources information system, Empowerment, and enhancement of community participation.

The constellation of sustainable development is defined as the maintenance of essential ecological processes and life support systems, the maintenance of genetic diversity and the sustainable use of species and ecosystems. In essence, the environmental sector focuses on protecting the integrity of ecological systems (Munasinghe, 2002). , in other words, at an early stage of development, the ecological conservation paradigm aimed at conserving water resources in such a way that activity was in line with the direction of national policy on water resources management and the Regional Regulation of Belu Regency, Number 6 of 2011 concerning the Regional Spatial Plan. So, it can be said that the Rotiklot dam and its associated sustainable agricultural irrigation facilities and infrastructure contribute to national achievements as an integral part of the national contribution to efforts to overcome water scarcity and sanitation worldwide. It happened, among others, because of the accelerated completion of the Rotiklot construction of only four years, a year faster than the 5-year construction period, namely 2015-2020. This condition also encourages the acceleration of the development of the Ainiba agricultural irrigation infrastructure network by utilizing water resources from the Rotiklot dam, as well as building water damage control infrastructure in the upstream-downstream watershed through reforestation and gabions along the watershed, including clean water transmission facilities and infrastructure for the community as many as 28 public hydrants. In addition, Ainiba swamp land management activities overcome flood inundation by diverting watershed flows to not interfere with the productivity of agricultural cultivation lands and freshwater fisheries. SPRINKLER technology saves water usage by water-using farming communities for water-saving agricultural irrigation. Economy The foundation of economic theory here is the Integration of economic and environmental understanding in a mutually supportive ecosystem, or what is commonly known as environmentally sound development. It is based on the juridical foundation of Law Number 32 of 2009 concerning Environmental Protection and Management. One of the considerations of this Article is that national/regional economic development is organized based on the principles of Sustainable and Environmentally Sound Development. It further states, "Sustainable development is a conscious and planned effort that integrates environmental (ecological), economic and social aspects into development strategies to ensure the integrity of the environment, the ability, welfare and quality of life of present and future generations ."(Law No. 32/2009, Article 1, Paragraph 3)Some sub-subjects related to this are: (1) Assumptions, criteria, and standards. (2) Scenarios used. (3) Alternative strategy choices. (4). Assumptions, criteria, and standards Assumptions are references used as patterns in management. The reference is the realization of good governance in economic and population growth. Good governance, including sustainable irrigation system governance, must be realistic. It means prioritizing urgent problems and the community's basic needs while adjusting to changes around them. In this constellation, water resources management becomes important and urgent because it concerns the survival of many people. Therefore, the real economy scenario is the best option because it is balanced with relatively low population growth. It means that by spurring the adequacy of water stocks from various water resources through the application of science and hydro-technology, it strengthens the stability of the existing ecosystem to sustain each other's lives. According to the criteria for water demand based on real economic schemes, at the semi-

city level, including sub-districts / villages, each person's water needs are 90 liters/person, including water needs for agricultural irrigation. It means that the largest water allocation is for irrigation, by utilizing water-saving technology. Then the criteria include how much potential surface water and groundwater. How much water households/people/day need, water quality index, land erosion, water allocation for irrigated agriculture. Finally, standards are concerned: Semi-urban population of 3,000-20,000, the standard requirement of 60-90 liters. Fatuketi Village residents fall into this category. Medium and large urban populations of >1,000,000, water requirement of 150-200 liters/per person. The Rotiklot watershed falls into the first category, generally the same for the province of East Nusa Tenggara. The available water discharge of 0.454 M3/det at Rotiklot dam in its current position is surplus with a water quality rating of good for consumption. (Interview with Mr. Daud Lay, PLT. Head of Puskesmas Ainiba, September 21, 2022) (2) Real Economic Scenario. The results showed that maize/paddy production increased from 1 ton to 5-6 tons per growing season due to increased land productivity through land preparation, the use of superior maize and rice seeds, fertilization, weeding, and regular spraying of crop pests under the technical guidance of PPLs.

In addition, there is easy access to marketing results because they can be reached from various directions. According to the plan, a Village-Owned Enterprise is being prepared to become a buyer/supplier of agricultural products at a decent standard price. Agricultural production and livestock (poultry) businesses have started to generate additional income for the community. The regular water supply from the dam has encouraged farmers to apply a two-season cropping pattern in a year, and some have even started to apply a three-season cropping pattern. The green revolution is starting to become a reality. (3) Altemative Strategy Options Sustainable Irrigation System Governance is capable of controlling and strengthening the stability of ecological, economic, and social ecosystems/communities of local communities. The social aspect of this sector aims to strengthen values related to good relations between people, harmonious human relations with nature, especially water, and vertical human relations with God. The village community in this area is an indigenous community whose relationships between people, relationships with nature (water), and vertical relationships with God are still very well maintained. This relationship strengthens the joint commitment to ensure the sustainability of any Project Program in the village. For example, customary rituals are considered sacred in almost all aspects of life, and this is believed to be able to ensure their survival. This condition is very influential on the willingness to accept development innovations from above and from the side in the form of tangible development results: the awakening of a sense of belonging (self of belonging), a sense of responsibility to maintain (self of preserving), and a sense of adding to its beauty (self of beautifying). Hadi Sabarno Yunus states this in his paper City Management, Spatial Perspectives, Yogyakarta, 2005, page 207). On the same matter, a traditional leader of the Fatuketi community expressed the determination of the entire indigenous community to play an active role in ensuring the program's sustainability for the welfare of present and future generations. (Interview with Fatuketi Village Head on September 23, 2022).

Table 1. Ecological, Economic, and Social Aspects (EES) of Rotiklot Dam Management

Focus	Sub-aspect/Result	Informant
Ecological Sustainability	Reforestation of upstream-downstream watersheds and areas around dams Opening alternative pathways downstream to reduce water pressure in the rainy season when flooding occurs Gabionization of watershed banks for dam stabilization Regulation of water area maintenance with Perdes, Perda, Government Regulations, and Laws Control of urban waste disposal in upstream watersheds and protection of forest areas	District Environment Office and Community Public Works Office NT River Basin II Sub-district head and village head District Environmental Agency District Land Agency

Economic Sustainability	50 hectares of land cultivated with high-yielding rice and corn varieties Verified farming by planting long-life crops, including hybrid coconut, cashews, Increased agricultural productivity due to the handling of five cropping efforts and Utilization of technology as many as 250 SPRINKLERs There is a trend of increasing community income from agricultural products, superior livestock and cattle, or goats, and contributions from the Tanam Jagung Panen Sapi program (TJPS Governor of East Nusa Tenggara). Stocking of freshwater fish fry at Rotiklot Dam Creation of fish ponds to utilize the excess water of the Rotiklot dam Effectiveness of planting and utilizing two planting seasons on an area of 120 hectares, using R 7 superior corn seeds and dam water sources in the early stages of 2021-2022.	Agriculture Office, Field Extension Officers, Community Community Assistance by Field Extension Officers and Village Heads NTT River Basin II 53 Sub-district Pokmas PT Permata Maju Provincial Agriculture Office District Livestock Service Office 53 community groups Provincial Agriculture Office Belu District Fisheries Service Kakuluk Mesak Sub-district Head Fatuketi Sub-district and Village Extension Officers Community group leaders
Community/Society Sustainability	The trend towards stronger self-help and community contribution in safeguarding, maintaining, and utilizing available water sources Individualization of land rights in the form of certification of people's lands Revitalization of Pokmas' understanding and skills in using agricultural machinery, such as hand tractors provided by the government Optimization and Utilization of project opportunities to increase added value, strengthening social ties with reduced conflict between residents and Timor Leste-born residents, in addition to strengthening healthy, competitive, independent work ethic	Traditional leaders and community leaders N.T. River Basin II Belu District Land Agency, village head, sub-district head N.T. River Basin II Field Extension Officer Village government Non-governmental organizations Church socio-religious organizations (NGOs)

CONCLUSION

From the findings and discussion that have been stated, three things can be concluded, namely: First, the Implementation of the Sustainable Irrigation System Governance Policy in Rotiklot Watershed, Belu Regency, to a certain extent, has been carried out by the provisions of the applicable regulations. It is also shown by the output and outcome as the achievement of the water resources management program/project results. However, it is not optimal and still requires capacity building and competence of the local community and increasing the role of the Regional Government to help implement Central Government policies about the tasks of assistance and as a tool for deconcentration of the Central Government. Second, this policy is implemented because it is supported by several factors, including (1) Policy sources in clear and supporting regulations. (2) The availability of financial resources from the Central Government through the State Budget (3) Communication with the government, in this case, the Ministry of Public Works, the River Basin Agency, and the Regional Technical Implementation Unit at the Provincial, District, and Village levels, is relatively well developed in order to coordinate and cooperate to support the success of the program. (4) local potentials in the agriculture, fisheries, livestock, and tourism sectors can be explored and developed optimally. (5) The support of a sizeable socio-religious organization, from the local church as a non-governmental organization.

The inhibiting factors are (1) Lack of community knowledge about rational ways of thinking and working. (2) Disharmony of understanding between economic and social factors because the orientation is to prioritize social aspects over economic aspects to change the level of life. (4) Lack of a comprehensive understanding of implementation as a complex process because it involves many people, institutions, and interests concerning basic needs that must be fulfilled. Third, the model found and at the same time recommended is the "Integration Model," which unites normative, academic, and empirical values on the various parties involved, namely scientists, government practitioners, non-governmental organizations, the business world, and the community.

Suggestions

Referring to the conclusions above, the researchers provide the following recommendations: First, the community empowerment program should be carried out continuously and directed towards strengthening business independence in the rational economic sector to balance the sociocultural aspects so that it becomes a force for social-economic change. Local Government policies should prioritize the development of the agrarian agricultural sector through an adequate allocation of Regional Budget II because the majority of the population in this area lives and depends on the non-industrial agricultural sector. Second, the regional executive and legislative parties not only make regional regulations but are also consistent in supporting the sustainability of Rotiklot dam management by carrying out concrete activities and law enforcement in the event of violations of the rules for protecting the safety of built water dams. Third, the Regional Government should intensively socialize existing policy sources to all policy implementers so that consensus is formed among implementers and policy objectives can be achieved and sustainable. Fourth, the Provincial Government ensures that the support of Regional Budget I funding sources continues to improve the management of the Ainiba Irrigation Area. Fifth, program assistance should be strengthened by increasing the number and quality of personnel and providing adequate incentive guarantees.

Acknowledgements

The authors would like to thank all parties who supported this research, which also helped the authors do much research. This research helped increase the authors' knowledge and skills. This research will be helpful for knowledge and a better future. No funding was received for conducting this study. This paper is an original, unpublished work, and not under consideration or publication elsewhere.

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