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POLICY AND REGULATORY IMPLEMENTATION IN WATER RESOURCES CONSERVATION DEVELOPMENT IN INDONESIA: A CRITICAL ANALYSIS

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Abstrak:
The suboptimal management of sustainable water resources in Indonesia stems primarily from the misalignment between economic, social, and environmental development strategies. Rapid population growth, characterized by diverse demographic dynamics, has intensified demands for essential resources such as food, water, energy, housing, and infrastructure. However, natural systems operate within ecological limits, necessitating prudent resource governance. Water resource conservation serves as a strategic pathway to achieving sustainable development, supported by a myriad of regulations and policy frameworks. The core issue, however, is not a lack of regulatory instruments or financial allocations but rather fragmented and overlapping policies that undermine implementation effectiveness. Regulatory contradictions have led to "programmatic cannibalism," where interventions compete rather than complement, diminishing the impact and coherence of conservation efforts. Sectoral fragmentation at the bureaucratic level reflects the disjointed nature of the regulatory environment itself. Moreover, watershed-based planning frameworks often fail to align with local government budgeting and planning mechanisms. This study synthesizes the landscape of legal and policy instruments governing water resource conservation across multiple sectors—including forestry, energy, agriculture, environment, spatial planning, and public works—at national and subnational levels. Using a qualitative literature review approach, the paper draws from policy documents, regulatory texts, and relevant international references. The findings highlight the urgency of regulatory harmonization, institutional integration, and multilevel governance readiness to support sustainable, coherent, and outcome-oriented water resource conservation strategies.

INTRODUCTION

Water is a vital resource whose quality and quantity must be maintained sustainably for future generations (Pambudi, 2021). Water resource problems arise due to many influencing factors, one of which is a significant increase in population (Pambudi et al., 2020; Bappenas, 2015). A large population affects the need for clothing, food, and shelter (Bellfield et al., 2016). Indonesia is a country with a relatively high population growth rate. This increase in population growth impacts increasing industrial, service, and urban activities that require support from various sectors, including raw water supply (Maheshwari et al., 2016; Bappenas, 2015; Fulazzaky, 2014). The need for raw water for industrial activities, the service sector, and urban needs is estimated to increase by 2-3 times compared to the current needs. Water supply requires more attention, considering its role as a vital resource, so its quality and quantity can be maintained sustainably for future generations

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(Pambudi & Kusumanto, 2023; Pambudi, 2021). The issue of water security is a national development agenda that needs to be achieved and planned until 2045.

Table 1. Data and Projections on Surface Water Availability in Indonesia 2000 – 2045 (m3/capita/year)

Year	Sumatra	Java	Bali	Kalimantan	Sulawesi	Maluku	Papua
2000	12371.06	836.55	2411.12	61838.35	13659.40	40182.60	236139.95
2005	11482.08	777.08	2275.88	57546.75	12737.21	37711.81	220547.03
2010	10653.77	724.74	2149.88	53542.24	11865.03	35398.52	206023.46
2015	9886.60	676.40	2031.40	49811.95	11053.59	33230.48	192484.93
2020	9195.15	630.26	1920.31	46412.35	10316.67	31194.01	179889.10
2021	9061.89	621.26	1898.83	45757.75	10175.85	30800.75	177474.05
2022	8931.01	612.37	1877.53	45111.95	10036.92	30411.88	175090.31
2023	8802.40	603.62	1856.47	44477.80	9897.39	30027.14	172743.30
2024	8675.48	595.08	1835.57	43854.74	9760.36	29646.92	170430.09
2030	7950.12	546.52	1713.35	40305.76	8956.95	27451.80	157197.03
2035	7393.86	509.97	1616.98	37595.86	8364.89	25715.61	146992.25
2040	6875.53	476.62	1526.69	35079.64	7808.14	24079.94	137474.19
2045	6392.18	445.82	1443.74	32741.38	7293.24	22550.18	128568.84

Source: Bappenas, 2020

In general, in the baseline situation, the domestic water supply at the national level can meet the overall water demand. The supply availability level (supply/demand ratio) is 342% to 223% of water needs in 2000-2045. However, spatially, water availability at the regional (island) level is starting to show scarcity levels in certain areas. Special attention needs to be given to water reserves on Java island, which has entered a rare status, and in the Bali-Nusa Tenggara region, which is already under pressure. Improvements need to be made to water quality, which has been a declining trend since 2015 (Bappenas, 2020; Pambudi, 2019).

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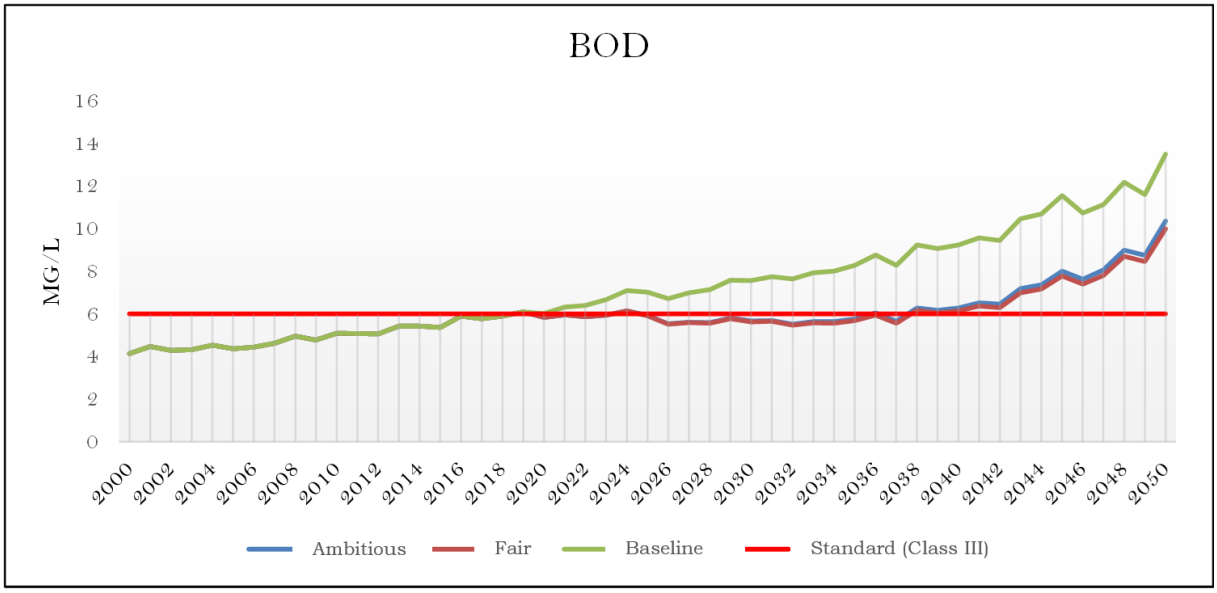

Figure 1. Data, Projections, and Scenarios of BOD Values of Water in Indonesia 2000 – 2045

Source: Bappenas, 2020

In baseline conditions, national water quality tends to deteriorate, with BOD and COD values increasing yearly (Bappenas, 2020; Razali et al., 2018). The BOD value at the national level will even exceed the BOD standard limit in 2030 (Class III BOD Standard Government Regulation 82 of 2011). The COD value at the national level has not yet exceeded the Class III COD standard limit of Government Regulation 82 of 2011 but shows a value that continues to increase annually. With sustainable agricultural management implementation, the BOD value can be reduced and will only exceed the BOD standard by 2038. The COD value can also be suppressed even though it still shows an increasing value.

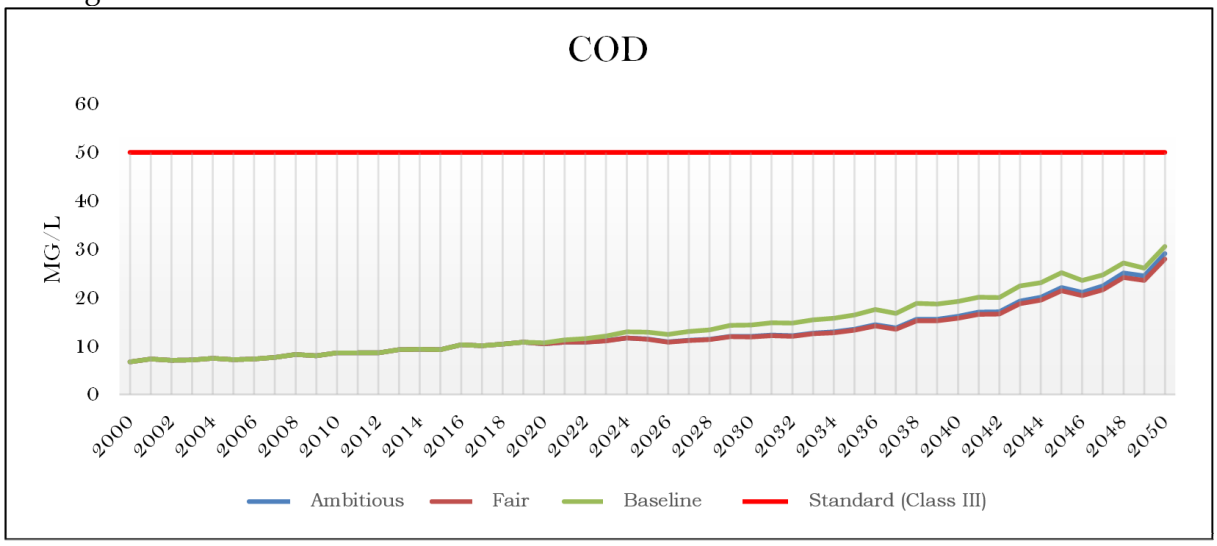

Figure 2. Data, Projections, and Scenarios of COD Values of Water in Indonesia 2000 – 2045

Source: Bappenas, 2020

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The main issue of water resources generally only covers three aspects, namely conservation, use (utilization), and control (control) of the destructive power of water. Water resource conservation is placed in the most crucial position, considering that this policy is the most vital in the concept of sustainable development in supporting other sectors (Pambudi, 2019). Water resource conservation policies cannot be separated from the locus of the watershed, and its ecosystem, which is land and hydrologically has a crucial position in supporting urban and rural socio-economic activities (Pambudi, 2019; Lubis et al., 2018; Maheshwari et al., 2016). In the concept of integrated water resource management, conservation is also part of the governance of the River Basin, which consists of regulations. Generally, water resource conservation policies consist of water source protection and preservation, water preservation, and water quality control and management. In its implementation, these three policies are in many sectors, like forestry, environment, public works/infrastructure, fisheries, agriculture, plantations, mining (groundwater), and others. This policy should have a significant impact on the watershed as well as the River Basin.

Presidential Regulation 2 of 2015 concerning the 2015-2019 National Medium-Term Development Plan has initiated a water resource conservation policy supported by a balance of 3 aspects, including infrastructure, ecosystems, and socio-institutions (GoI, 2014a). It is continued in Presidential Regulation 18 of 2020, National Medium-Term Development Plan 2020-2024, where efforts to conserve water resources in the infrastructure aspect are made by water reservoirs construction and rehabilitation, reservoirs, ponds, and lakes (GoI, 2020). The ecosystem aspect is carried out by improving river basin ecosystems, forest and land rehabilitation, and spatial planning to accommodate community activities, fisheries, agriculture, and industry, as well as to ensure the availability and quality of water. Social and institutional aspects are carried out in the form of strengthening community involvement in watershed management, strengthening coordination between sectors, and encouraging the implementation of action plans contained in several documents such as Regional Spatial Planning, River Basin Management Plan, Water Resources Pattern, and so on (Pambudi, 2024; Bappenas, 2015).

Vegetative water resource conservation in forest and land rehabilitation policies for critical land restoration within forest management units and watersheds. The above efforts will still face challenges regarding the rights and critical land status to be planted. In addition, there are other challenges concerning the less-than-optimal control of space utilization within the watershed. However, the rate of deforestation within the forest area has been successfully lessening. The forest and burned land area has also been significantly reduced through effective mitigation. In its development, the watershed tends to experience damage and decline in quality. This condition's measurement is from the indicators of erosion and sedimentation rates, which increase due to changes in land use in the upstream area from forests to agriculture, plantations, and settlements. Another indicator is related to hydrology, especially the occurrence of striking fluctuations in river discharge in the rainy and dry seasons and the decline in water quality (Razali et al., 2018; Reddy et al., 2017).

The suboptimal achievement of water resources policy needs further review. The aspects of ecology, hydrology, economy, and other branches of science in various studies are inseparable from the dynamic nature of water resources, which impacts fragmented handling efforts in several ministries/institutions. Each sector is managed based on sectoral tasks and regulations so that, in a particular time process, sectoral egoism will be formed, focusing more on each individual's interests. It impacts overlapping, or even "gaps" (emptiness) in the responsibilities and authorities of institutions that plan and compile regulations. Furthermore, existing regulations increasingly

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sharpen overlapping policies, even cannibalism of activities between institutions, even within an institution itself.

Research related to regulation synthesis and water resource conservation policies as a basis for policies and budget allocations is an interesting topic to discuss. As is known, almost all aspects of life and policies in Indonesia are governed by multiple formal regulations, even with the potential for overlapping. It is evident when existing regulations are reflected in various water resource conservation policies, where 'program/activity cannibalism' occurs, preventing the achievement of the expected outputs and outcomes. Sectoral ego in the governance of government institutions begins with the sectoral ego of the regulations made. In addition to policies, water resource regulations are also interesting to review as an impact of these regulations. This paper aims to present a synthesis of laws and policies related to water resource conservation for sustainability, as reflected in various policies implemented by the government. This analysis is expected to identify and present a review of the implementation of water resource conservation to provide recommendations on several obstacles to implementing water resource conservation policies in the field, those implemented by the government, the business world, and the community.

METHODS

This paper uses literature reviews through relevant theoretical references and is based on information on Watersheds, River Basins, and Water Resources policies. The author uses secondary data from various sources, such as books, documents, and applicable regulations, including in a global context. The analysis was through a comprehensive review of secondary sources, including laws and policies related to the Integrated Watershed Management Plan, River Basin Water Resources Management Pattern, Watershed Monitoring and Evaluation, National Medium-Term Development Plan, Regional Spatial Plan, Regional Medium-Term Development Plan, Regional Government Work Unit Work Plan, Laws, Government Regulations, Ministerial Regulations, Director General Regulations, Regional Regulations, Governor/Regent/Mayor Regulations and other documents. Other sources used are the results of studies by previous relevant researchers. The analysis results in a synthesis of information and a review of water resource conservation regulations and policies, providing policymakers with insights into opportunities, strengths, and weaknesses of existing laws and policies.

Water Resources Conservation. Development of Water Resources Conservation Policy. Water conservation policies have been in place since the colonial era, although before the 1980s, this policy focused on land protection. From the Soekarno administration until the Reform era, land and water conservation policies were through land rehabilitation activities like planting perennials. Various land rehabilitation programs are carried out in damaged forest areas and on community-owned land. This program has undergone several "slogan" changes but has the same form: planting perennials. The government implements water resource conservation policies using a vegetative approach, driven by awareness of critical land conditions in several areas that threaten soil fertility and damage watersheds.

Water resource conservation policies with a technical civil approach have been carried out since the colonial era. The Dutch Government built several reservoirs in Indonesia to support the availability of agricultural irrigation water. From the time of Soekarno to the Reform era, the government constructed reservoirs, dams, and weirs in several locations. The government expanded the construction of reservoirs, dams, and weirs during the Soeharto era with the assistance of foreign loans. In the era of President Jokowi, the construction of reservoirs/dams and weirs was re-encouraged to support government programs to achieve food security.

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The government has not widely implemented water resource conservation policies using an agronomic approach. The government has not widely implemented interventions to promote environmentally friendly agricultural practices that support watershed sustainability. The water resource conservation program uses an agronomic approach through demonstration plots in several horticultural farming areas. Since the introduction of water-saving agricultural technology, the water resource conservation program using an agronomic approach has been implemented through water-efficient farming practices (Madison, 2010).

The Indonesian government has implemented water resource conservation policies using a vegetative approach since the administration of President Soekarno. In this era, specifically in 1946, the government of President Soekarno had reforested an area of 110,000 ha in degraded land areas. This activity was done by the reforestation committee formed in 1946. Although small, reforestation activities were still carried out until the end of the Soekarno administration, culminating in 1961, raising a program with the theme of National Greening Week. President Soekarno also formed a committee to implement the reforestation program. The "Forest, Land, and Water Rescue Committee" established in 1961, was responsible for planning various programs to maintain soil fertility and improve the hydrological cycle in river basins.

The Karang Kitri program was also launched by the Soekarno administration and continued until the end of his presidency. This program encourages people to get used to planting trees in their yards. In the era of the Soeharto administration, activities supporting water resource conservation through a vegetative approach continued in each Repelita, specifically through the Reforestation Presidential Instruction introduced in the 1970s. The program to handle forests and degraded land has become a national priority in Repelita IV by building forest and land rehabilitation demonstration plots, community forest development, and village nursery garden creation. Furthermore, the forest and land rehabilitation program has improved not only planting activities but also active community involvement. Community involvement is achieved by holding various independent rehabilitation competitions and training for the community, including women and youth (Nawir et al., 2008).

After the Suharto administration, they continued various forest and land rehabilitation programs. In this reform era, the development of forest and land rehabilitation activities involves local governments. The rehabilitation movement was also in 2003 through the National Movement for Forest and Land Rehabilitation program. This program intensively addresses and repairs critical land in both forest and privately owned land. The national movement for forest and land rehabilitation implementation has taken up a budget of Rp5.9 trillion with a target planting location of 3,000,000 ha. The government implemented this program in 15 provinces in 2003, including 26 watersheds. The government implemented this program in 31 provinces in 2004, including 141 watersheds and 374 districts/cities (Santoso, 2005). The forest and land rehabilitation program implementation continues until now, with a tendency to increase the budget every year. Since 2008, forest and land rehabilitation activities have also used special allocation funds (SAF) through the financial balance mechanism. The local government operates rehabilitation activities using the SAF budget.

The Dutch government implemented water resource conservation policies using a technical civil approach. Irrigation infrastructure projects began in 1850 to increase food production and overcome famine. The Dutch government continued the project of expanding dams and irrigation in 1901. In the era of the Soekarno administration, the construction of water conservation facilities began in the tidal swamp area in Kalimantan with the development of the polder system. The Old Order government also initiated efforts to build reservoirs, including the Jatiluhur reservoir and

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other reservoirs, along the Citarum River, with implementation starting in the 1950s. The construction of reservoirs along the Brantas River was also carried out in the 1960s (Effendi, 2008). In the era of the Suharto administration, the construction of reservoirs/dams and weirs was more massive. The food self-sufficiency program has implications for improving dam/reservoir infrastructure facilities for agricultural irrigation.

Until 2000, water resources/dams were built, including about 36,500 weirs and 219 dams/reservoirs that provide raw water for settlements, agriculture, industry, and other needs (Sutardi, 2002). The construction of water conservation infrastructure with a civil technical approach has not only been carried out by the Ministry of Public Works and Public Housing. Two other ministries, namely the Ministry of Forestry (now called the Ministry of Environment and Forestry) and the Ministry of Agriculture, also carry out this technical civil development activity. The Ministry of Forestry also carries out the construction of embankments, weirs, infiltration wells, and check dams. Meanwhile, the construction of ditch dams, rehabilitation of the Farmer-Level Irrigation Network, Village Irrigation Network, and Micro Water Management, as well as the construction of groundwater irrigation, surface water irrigation, and pressure irrigation, is by the Ministry of Agriculture.

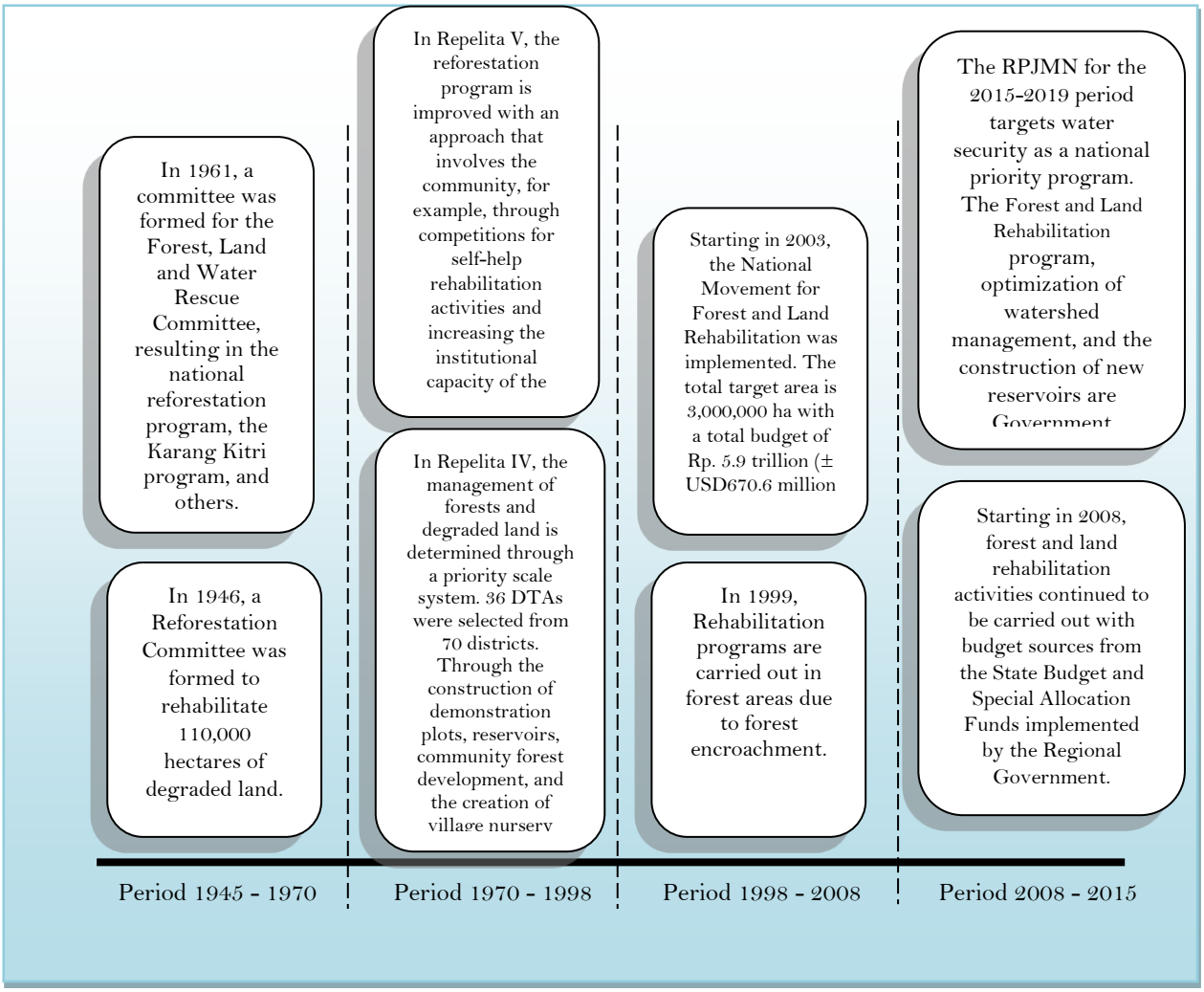

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Figure 3. Water Resources Conservation Policy with a Vegetative Approach Over Time
Source: Bappenas, 2015

Water resource conservation policies using an agronomic approach were introduced following the discovery of agricultural cultivation techniques and technologies focused on water conservation. In Indonesia, the agronomic approach to water resource conservation was only in the 2000s, with testing rice cultivation techniques using the SRI (system of rice intensification) method. The first SRI method was by a priest, Father Henri de Laulanie. Furthermore, the development of the SRI method began in Madagascar around the 1980s (Madison, 2010). Prof. Norman Uphoff later developed the SRI method. In Indonesia, Prof. Norman Uphoff introduced the SRI method in 1997. This year, Prof. Norman Uphoff presented the SRI method for the first time outside Madagascar. Two years after the introduction of the SRI method, testing and evaluation of the SRI method was carried out in Sukamandi, West Java, by the Rice Crop Research Agency. The first trial demonstration plot creation was in Sukorejo-Pasuruan, which is the development and teaching center of the SRI method. Currently, the development of the SRI method that can save water has not been fully used by Indonesian farmers. The new SRI method implementation policies are limited to expanding and multiplying trial demonstration plots in various locations.

The Concept of River Basin Territory and Watershed: Sectoral Egos in a Regulatory Framework. The "blue water" concept includes rivers (Chen et al., 2016). Experts divide aquatic areas into various groups based on the perspective of the discipline used. The commonly used viewpoint related to the grouping of aquatic zones is from a morphological, ecological, and anthropogenic perspective (there is a role and human intervention in these water areas).

Before the 1980s, water resources engineers partly based the grouping of River Basin Territories on a morphological (physical) hydraulic approach. It is similar to the theory that distinguishes rivers as "blue water" into macro (large), meso (medium), and micro (small) rivers. If referring to the eco-hydraulic concept, in its development, the grouping of the River Basin Territory is no longer only based on the approach of the physical hydraulic aspect but also the ecological, economic, and even social aspects.

From an ecological perspective, river water areas are generally classified into still (non-flowing) and dynamic (flowing) water areas. Areas of water that do not flow in their development can be lakes, dead rivers, ponds, embankments, swamps, tributaries that flow only during the rainy season, and others. Meanwhile, the dynamic (flowing) water areas category, for example, includes underground rivers, surface rivers, seas, currents, and so on.

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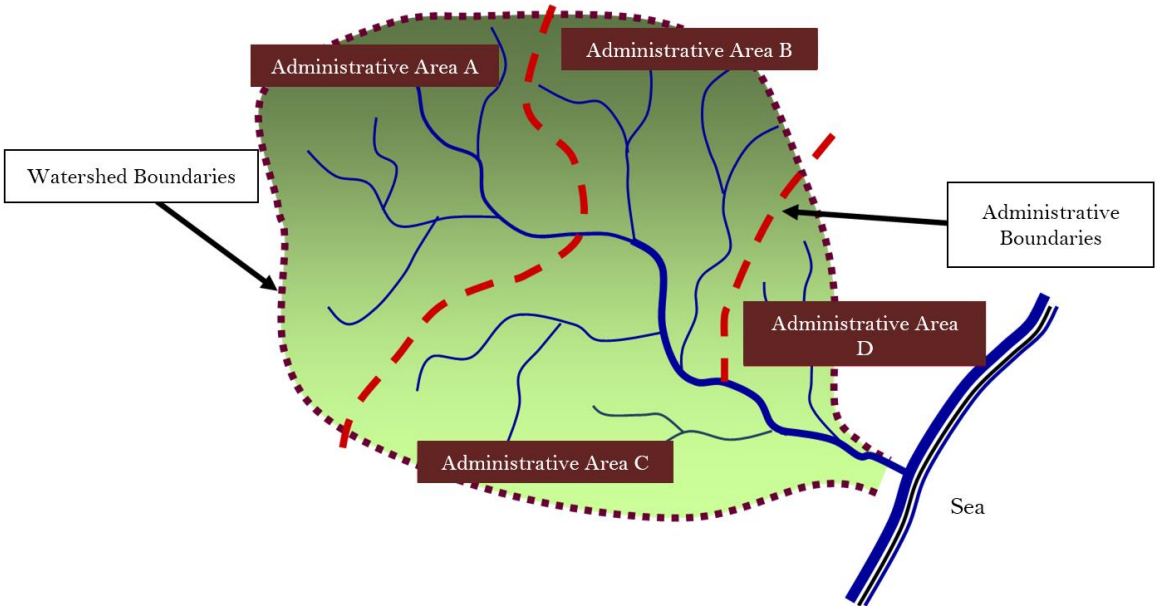

Figure 4. Simple Illustration of Watershed
Source: Pambudi & Kusumanto, 2023

Regulations in Indonesia related to water areas have further sharpened the sectoral ego barriers since the 1980s. However, from an ecological point of view, the River Basin Territory cannot be separated from the watershed. A watershed (according to Law 37 of 2014 concerning Soil and Water Conservation) is a land area including rivers and their tributaries in a unit, which has the function of containing, storing, and draining rainfall that comes from rainfall to the lake or the sea naturally, this water area has a boundary on land which is a topographic separator and a boundary in the sea to the water area that is still affected by land activities. Sub-watersheds are part of a watershed that contains, stores and drains rainwater through a tributary into the main river. Each watershed is divided into sub-watersheds. Law 7 of 2019 on Water Resources defines River Areas as comprising at least one or a combination of several watersheds and/or small islands (islands with an area less than or equal to 2,000 km²). Changes to the watershed will impact its Sung River Basin Territory. The watershed consists of the entire river channel, including where the rain falls into the river in question in the hydrological cycle. The river boundary channel definition is the right and left river bank grooves consisting of flood, ecological, landslide, and security banks.

In various literature and regulations, watershed water areas include a closed ecosystem dominated by land factors, water flows from rain (including rivers), and ridges as their outer boundary. The watershed system forms the flow of energy chains in the ecosystem from the upstream to the downstream area. Therefore, when using watershed boundaries for planning and managing large-scale water resource development, they cannot be treated in isolation within a single watershed but must be considered with surrounding watersheds. It is because, in reality, Indonesia's administrative divisions are based not on hydrological cycle boundaries but on an anthropogenic approach. Watersheds, as an integral part of the watershed (which are not covered) in regulations, are a separate problem when looking at the area in the context of a coordination unit, not a hydrological unit. Two main regulatory pillars govern this area: Law 17 of 2019 and its derivatives and Law 37 of 2014 and its derivatives. Researchers can further review Government Regulation 37

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of 2012 on Watershed Management, which remains in effect, especially the existence of this regulation, which existed earlier than the two laws above.

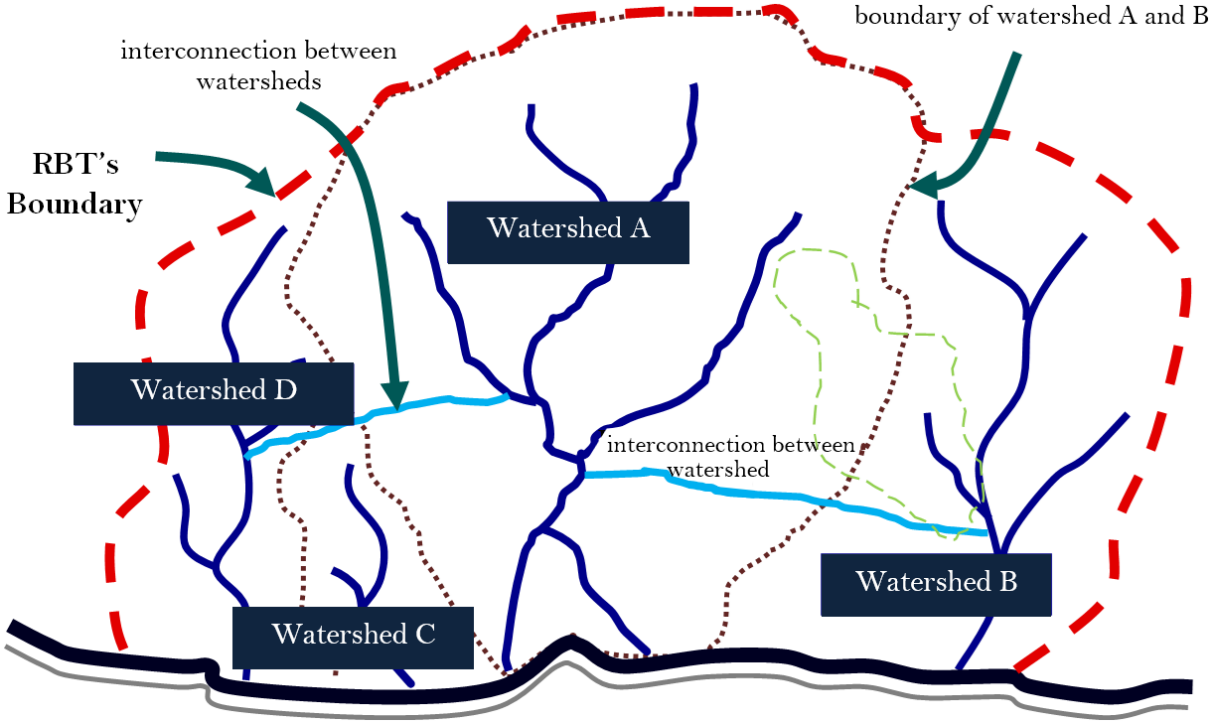

Figure 5. Simple Illustration of River Basin Territory
Source: Pambudi & Kusumanto, 2023

Based on data from the Ministry of Environment and Forestry (Environment and Forestry), Indonesia has more than 17,000 watersheds. In line with Law 17 of 2019, efforts to coordinate such a large number need the concept of River Basin Territory, which in Indonesia is defined as a River Basin Territory. Currently, Indonesia has a total of 128 River Areas. The number consists of 5 Cross-Country River Areas, 28 National Strategic River Areas, 31 Cross-Provincial River Areas, as many as 52 Cross-Regency/City River Areas, and 12 River Areas in One Regency/City. It is stated in the Regulation of the Minister of Public Works and Public Works Number 04/PRT/M/2015 concerning Criteria and Determination of River Areas.

In Law 17/2019 on Water Resources, the regulation of water security authority and responsibility by the central, provincial, and regency/city governments is based on the concept of River Basin Territory. To achieve integrated water resources management, prepare a standard reference for stakeholders in the form of a Water Resources Management Pattern document in the framework of the River Basin Territory that combines surface water and groundwater as the foundation.

This document is prepared with coordination between related agencies as a manifestation of the Water Resources Management Plan, which is the spirit of reducing the ego sector. This document is a master plan for the conservation, utilization, and control of water degradation that is prepared in a coordinated manner and based on the concept of River Basin Territory. Further elaboration of this document is in the activity plan of each related agency, including those that also carry out the

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watershed management concept. The essence of water resources management in Indonesia is from the River Basin Territory, which has various conditions. This diversity includes, among others, area, population, hydrological and climatic conditions, socioeconomic activities, water utilization levels, water users, and management institutions.

With the various conditions and problems of the River Basin Territory, River Territory management cannot be generalized to other river areas, especially if there is a watershed. For this reason, it is necessary to have a typology or grouping of the River Basin Territory based on its characteristics. Information about which River Basin Territory is a priority and how the order of priorities (inseparable from the condition of the watershed) is an urgent matter that needs to be addressed. In vegetative water resource conservation, stakeholders must prioritize data and action plans for each watershed, as they are crucial. What remains incomplete until now is how to link at the implementation level between the River Area Water Resources Management Pattern Document and the Integrated Watershed Management Plan at the local government policy level with their regional income and expenditure budget. In practice, these two documents are referred to by the supporting technical ministries/agencies, namely the Ministry of Public Works and Public Housing (PWPH) and the Ministry of Forestry.

Water Resources Conservation Regulations. Indonesia enacted Law 5 of 1967 on Forestry, which analysts later criticized for providing limited space for community rights. This regulation offers dominant control over the state, especially the central government, in terms of planning, administration, exploitation, and protection of forests. The issuance of Law No. 41 of 1999 on Forestry, which replaced Law No. 5 of 1967, brought fresh air by opening opportunities for community involvement in forest management. This law also includes provisions specifically recognizing customary forests that can be managed by indigenous communities within their territories (Pambudi, 2020; GoI, 1999). Social forestry is considered a legal entrance to realize community empowerment, as well as the state's efforts to keep forests sustainable while saving existing water resources (Pambudi, 2020). Local communities are given a role based on their wisdom but still provide incentives to support sustainable development (Rakatama & Pandit, 2020).

The water resource conservation policy that has been carried out since the first government era until now has used a large budget, specifically to finance forest and land rehabilitation activities and the construction of reservoirs, which have reached > 219 dams/reservoirs and > 36,500 dams (Sutardi, 2002). Looking at the results of the policy implementation achievements, it shows that the results achieved did not portray a significant impact. Although the forest cover tends to increase, it does not affect the sedimentation reduction every year. In this context, a gap remains in implementing water resource conservation policies within the scope of watersheds.

External and internal factors influence the achievement gap in the implementation of water resource conservation policies. External factors exist in dimensions that are outside managerial aspects, such as population growth, which causes land use patterns to change, and climate change issues that cause extreme climate that affects the hydrological cycle (Reddy et al., 2017; Maheshwari et al., 2016; Bappenas, 2015; Fulazzaky, 2014). These two external challenges increase the burden of water management in watersheds. The gap in policy achievement from internal factors is related to managerial aspects, especially institutional governance and the implementation of policy instruments (regulations).

The gap in policy achievement from institutional governance is related to the problem of management effectiveness by the apparatus related to water resources (Pambudi, 2019). The implementation of watershed-based water resource management relies on the role of various parties, including the central government, local governments, and other elements. This cross-

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sectoral management requires strong coordination to support the achievement of watershed and watershed-based water resource conservation and river areas. The problem of coordination is the main problem in institutional governance. The action plan contained in the Integrated Watershed Management Plan (IWMP) and the River Area Water Resources Management Pattern cannot be suitably implemented by the parties, especially local governments. The implementation process of the action plan document has not been running optimally due to the weak communication and coordination built by the parties. Institutions such as the Regional Development Planning Agency (Bappeda), the leading sector in the Regional Government, have not played their role optimally in supporting the internalization of the action plan documents that have been prepared (IWMP and River Water Resources Management Pattern).

The gap in policy achievement in regulatory implementation is caused by the lack of implementation of several mandates in regulations related to the management of water resource conservation. Several regulations, both Laws, Government Regulations, and Regulations of the Ministry of Technicalities, have not been implemented effectively to support water management and water resource conservation efforts. Some of these regulations include Law 17 of 2019 on Water Resources, Law 41 of 1999 on Forestry, Law 37 of 2014 on Soil and Water Conservation, Law 26 of 2007 on Spatial Planning, Law 18 of 2003 on the Prevention and Eradication of Forest Damage, Law 32 of 2009 on Environmental Protection and Management, Law 23 of 2014 on Regional Government, PP 37/2012 on Watershed Management, PP 26/2008 on National Regional Spatial Planning, Permenhut P.39/Menhut-II/2009 concerning Guidelines for the Preparation of Integrated Watershed Management Plan, Permenhut P.61/Menhut-II/2013 concerning the Watershed Management Coordination Forum.

The gap in policy achievement caused by the non-implementation of Law 41 of 1999 and Law 26 of 2007 is related to the mandate of a minimum limit of 30% forest area/forest cover for watershed landscapes with a proportionate distribution (GoI, 1999). The mandate implementation is ineffective in several places within the watershed. The gap in policy achievement resulting from the non-implementation of Law 37 of 2014 affects the failure of landowners, land rights holders, and permit holders to fulfill their responsibility to carry out land and water conservation and to adhere to its principles. In reality, many land rights holders do not follow the principles of land and water conservation, utilizing the land. The mandate of Law 37 of 2014 prohibits everyone from converting the use of prime land in protected and cultivated areas. In practice, land conversion occurs on prime land illegally in forest areas. Another mandate is in Law 37/2014 concerning providing environmental service payments to land and water conservation organizers. It is uncommon for this practice to be implemented. Article 36 of Law 37/2014 also mandates that the government/local government provide assistance, compensation, incentives, and compensation to everyone who has the will to carry out land and water conservation.

The government has not fully implemented this due to budget limitations. Although Law 37 of 2014 outlines criminal penalties for individuals and farmers who violate land and water conservation regulations, including fines and imprisonment, enforcement in practice has not occurred.

The problems of development and spatial planning are inseparable, considering that spatial planning involves spatial-geographical aspects that include a balance of needs between social, economic, and environmental needs (Pambudi & Sitorus, 2021). Law 26 of 2007 implementation is not optimally related to the green open space allocation of at least 30 percent in urban areas. Some provinces/districts/cities do not implement this regulation. Law 26 of 2007 also mandates a sanction to individuals/institutions that do not use space according to spatial plans. The practice occurred in

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some places that do not implement the sanctions. Another mandate in Law 26 of 2007 is not comprehensive space utilization permits, which are marked by the number of space use permits granted that do not follow the spatial plan (Pambudi, 2019).

Law 18 of 2013 mandates that individuals/private institutions who carry out plantation activities without permits, illegal logging activities, and other forbidden activities in forest areas are subject to imprisonment and fines (GoI, 2013a). Field facts show that many land uses for plantations are illegal, and rampant illegal logging and other activities are not easy to handle legally. Plantation activities, illegal logging, and land use still occur today in Indonesia's forest areas.

Law 32/2009 mandates that the government and local governments are obliged to prepare and implement Strategic Environmental Assessments (SEA), which as a reference for policies and regional development plans, including a reference for the preparation of spatial plans, long-term development plans, and mid-term development plan both at the central and regional levels (GoI, 2009). However, the SEA document is ineffective as a reference for development policies and regional spatial planning. In addition, Law 32 of 2009, Article 17 mandates a clause that if the results of the SEA say that they have exceeded the carrying capacity and capacity, then the improvement of policy, plan, and/or development program must follow the recommendations/directions of the SEA. In practice, SEA has not been fully used as a controlling instrument for the carrying capacity, and the environment's carrying capacity affects the sustainability of watersheds.

In practice, sectoral regulation and regulation of water resources often lead to the cannibalization of programs/activities in several incidents. A simple example is when relevant agencies planted trees along both sides of the river as part of a water resource conservation effort. Sometime after that, there was a dredging of river sediment by the relevant agencies, whose disposal location was to the right and left of the river, where the tree was planted. There are two reasons: there is no coordination, and the second is that the relevant state institutions only focus on meeting the demands of regulations/policies based on their suitable position. When the job reaches the output level of completion, it indicates that performance has been measured or achieved. The outcome approach is still not a measure for sustainable water resource conservation.

RESULT AND DISCUSSION

Synthesis of Regulations Related to Water Resources Conservation in Indonesia. The gap in the achievement of water resources conservation policies is due to the non-implementation of Government Regulation 37 of 2012, which is related to the mandate on the preparation of an Integrated Watershed Management Plan (IWMP) carried out by ministers (cross-country/cross-province), governors (in provinces/across districts/cities), regents/mayors (within districts/cities). However, in practice, the compiler of the IWMP is the Watershed and Protected Forest Management Center, which is a technical management/implementation unit of Ministries/Institutions (in this case, representatives of the Minister of Environment and Forestry), even though the ratification is by the governor/regent/mayor. The budget for the preparation of the IWMP is only given to the Watershed and Protected Forest Management Center so that the governor/regent/mayor does not have a strong bond in the preparation of the IWMP. Until now, there has been no other regulatory instrument to implement the mandate of Government Regulation 37 of 2012 in the form of budget allocation for local governments tasked with preparing IWMP. Government Regulation 37 of 2012 on Watershed Management also mandates that IWMP must be a reference as a development plan for sectors and regions in each province/district/city (Pambudi, 2009; GoI, 2012). In reality, the internalization process of IWMP into a spatial plan/long-term regional development plan is

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challenging. Many action plans in the IWMP are not operational/not implemented by the local government for various reasons and accompanying obstacles.

Government Regulation 37 of 2012 also discusses the potential takeover by the central government if the local government is negligent in its obligations regarding watershed management. It has never happened in implementation. Article 50 of Government Regulation 37 of 2012 also mandates monitoring and evaluation activities for ministers/governors/regents/mayors according to the characteristics of the watershed area. Watershed monitoring is still carried out by the Watershed and Protected Forest Management Center as the technical ministry's implementation unit. Another problem faced in Government Regulation 37 of 2012 is Law 23 of 2014 on local government. The regulation mandates that the management of district/city watersheds be transferred to the provincial authority (Pambudi, 2019; GoI, 2014b; GoI, 2012). Thus, the mandate of Government Regulation 37 of 2012 states that watershed management in districts/cities by the Regent/Mayor becomes irrelevant.

The gap in the achievement of water management and water resource conservation policies caused by the non-implementation of Government Law 26/2008 is related to the mandate that the creation of a protected area of at least 30% of the island's area follows its ecosystem conditions (GoI, 2008; GoI, 2007). In some watersheds, the functions of protected areas are < 30% from forests and non-forests. Government Regulation 26/2008 also provides directions for efforts to save environmental capabilities against the pressure of change that causes negative impacts on activities to maintain the lives of humans and other living things. However, in practice, the control of changes in land use with a protected function cannot be handled properly, both in forest areas and outside forest areas with protected function (Pambudi, 2009). Another mandate in Government Regulation 26/2008 is the importance of returning and improving the function of protected areas that have declined due to the development of cultivation activities. It aims to realize and maintain the balance of the regional ecosystem. However, in reality, some protected lands, both in forest and outside forest areas, are not controlled for use or restored/returned to improve their function as protected areas.

The achievement gap due to the non-implementation of Government Regulation 26 of 2008 is related to the control of cultivation activities so that they do not exceed the carrying capacity and the carrying capacity of the environment. However, in reality, the management of cultivation development exceeds the environment's carrying capacity, especially in the upstream watershed area, both in forest areas and outside forest areas. Restriction implementation is ineffective on cultivated activities in disaster-prone areas to minimize the potential for disaster events. The mandate of Government Regulation 26 of 2008 related to ecosystem balance, biodiversity, regional protection functions, unique landscapes, and sustainable national culture has also not been effective. In practice, the challenge of nature protection areas is land conversion for illegal cultivation. This nature-protected area is generally an upstream watershed area. Another mandate from Government Regulation 26 of 2008 that has not been effectively implemented concerns strategies for preserving and improving environmental functions and carrying capacity.

Table 2. Problems in the Implementation of Regulations Related to Water Resources Conservation

No	Regulation	Problems in the Practice of Implementing Regulations
1	Law 41 of 1999 concerning Forestry	- Law 41 of 1999, Article 18, provides a mandate regarding a minimum limit of 30% of forest area/forest cover with proportional distribution for the watershed landscape in

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No	Regulation	Problems in the Practice of Implementing Regulations
		several places within the watershed scope but does not implement this mandate.
2	Government Regulation 37 of 2012 concerning River Basin Management	- Government Regulation 37 of 2012, Article 22, provides a mandate regarding the preparation of IWMP carried out by ministers (cross countries/cross provinces), Governors (in provinces/cross districts/cities), and Regents/Mayors (in districts/cities). However, in practice, the Watershed and Protected Forest Management Center (as the representative of the Minister) prepares the IWMP, even though the Governor, Regent, or Mayor is responsible for its ratification. The budget item for the IWMP preparation is only for the Watershed and Protected Forest Management Center. The Governor/Regent/Mayor does not have a strong bond in IWMP preparation. There needs to be a mechanism for other regulatory instruments to implement the mandate of PP 37/2012 regarding budget allocation for regional governments that are given the mandate to prepare IWMP. - Government Regulation 37 of 2012, Article 35, paragraph 4 mandates that IWMP must be a reference as a sector and regional development plan in each Province/Regency/City. However, internalizing IWMP into regional spatial planning/regional long-term development plans is difficult. Many action plans in IWMP are not operational/implemented by the regional government. - In Government Regulation 37 of 2012, Article 42 mandates the implementation of watershed management to be carried out by the Minister (cross-country/cross-province), Governor (in province/cross-district/city), and Regent/Mayor (in district/city). In reality, watershed management affairs are handled by the Watershed and Protected Forest Management Center as the technical representative of the Ministry. Another problem faced in Government Regulation 37 of 2012 is the issuance of Law 23/2014 concerning regional government, where the law mandates that the management of watersheds in districts/cities be transferred to the provincial authority. It suggests that the mandate of Government Regulation 37 of 2012, which states that watershed management in districts and municipalities is the responsibility of the Regent or Mayor, is no longer relevant. - According to Government Regulation 37 of 2012, Article 43, if the provincial and/or district/city government neglects its authority in watershed management, the central government will assume responsibility, with funding sourced from the respective regional budget. In practice, this has never happened. The Watershed and Protected Forest Management Center still carries out watershed management. - Government Regulation 37 of 2012, Article 50, mandates monitoring and evaluation activities to be given to the Minister/Governor/Regent/Mayor according to the

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No	Regulation	Problems in the Practice of Implementing Regulations
		characteristics of the watershed area. In reality, watershed monitoring and evaluation is carried out by the Watershed and Protected Forest Management Center as a representative of the technical Minister.
3	Minister of Forestry Regulation P.39/Menhut-II/2009 concerning Guidelines for the Preparation of Integrated River Basin Management Plans	- Regulation of the Minister of Forestry Number P.39/Menhut-II/2009 contains the structure of the presentation of the IWMP manuscript. However, in several cases, the IWMP document has not been fully contained according to the mandate of P.39/2009. For example, the Jeneberang IWMP does not include program and activity plans in the IWMP document.
4	Minister of Forestry Regulation P.61/Menhut-II/2013 concerning the River Basin Management Coordination Forum	- In Permenhut P.61/Menhut-II/2013, article 10 provides a mandate regarding the duties, functions, and authorities of the Watershed Forum. However, authorities do not implement these duties, functions, and authorities due to HR problems (member activity) and budget problems.
5	Law 37 of 2014 concerning Soil and Water Conservation	- Law 37 of 2014, Articles 7 and 29, mandates that land rights holders, land controllers, permit holders, or land users are responsible for implementing land and water conservation and must adhere to conservation principles. In reality, many land rights holders do not implement land and water conservation measures or follow conservation principles in their land use. - In Law 37 of 2014, articles 18 and 20 prohibit everyone from converting prime land use in protected and cultivated areas. Land conversion still occurs in prime land and is carried out illegally in forest areas. - In Law 37 of 2014, articles 32 and 33 mandate the provision of environmental service payments to land and water conservation organizers. The implementation of this practice is uncommon. - Law 37 of 2014, article 36 mandates that the central/regional government provide assistance, settlement, incentives, and compensation to everyone who has the will to organize land and water conservation. It has not been fully implemented because the government budget is limited. - In Law 37 of 2014, articles 59, 60, 61, 62, 63, and 64 concerning criminal provisions for individuals and sharecroppers who violate land and water conservation regulations are provided with fines or imprisonment. In reality, criminal enforcement practices are not carried out. - In addition, derivative regulations of the Land and Water Conservation Law are still being drafted, which is also an obstacle to implementation, both from a technical and legal perspective.
6	Law 26 of 2007 concerning Spatial Planning	- Law 26 of 2007, Article 17, Paragraph 5, mandates a minimum of 30% forest area or forest cover within watershed landscapes, but several local governments have not implemented this mandate in various watershed locations.

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No	Regulation	Problems in the Practice of Implementing Regulations
		- Law 26 of 2007, article 29 mandates the allocation of green open space in urban areas of at least 30% of the area. In reality, several Provinces/Districts/Cities have not implemented the mandate of this Law. - Law 26 of 2007, article 35 mandates the imposition of sanctions on individuals/institutions that do not use space according to the spatial plan. However, in practice, in several places, these sanctions are not implemented. - Law 26 of 2007, article 37, paragraphs 1-8, concerning spatial utilization permits, the spatial utilization permits granted do not follow the spatial plan.
7	Law 18 of 2013 concerning the Prevention and Eradication of Forest Damage	- Law 18 of 2013, articles 92, 98, and 105, mandates that individuals/private institutions that carry out plantation activities without permits, illegal logging activities, and other illegal activities in forest areas will be subject to imprisonment and fines. However, land use handling for illegal plantations, illegal logging, and other activities is not simple through formal law. Plantation activities, illegal logging, and land use still occur in the forest.
8	Government Regulation 26 of 2008 concerning National Spatial Planning	- In Government Regulation 26 of 2008, article 7, paragraph 2 mandates the realization of a protected area in one island area with an area of at least 30% of the island area according to the condition of its ecosystem. In several watersheds, protected areas from forests and non-forests are <30%. - In Government Regulation 26 of 2008, article 7, paragraph 3 mandates the protection of the environment from the pressure of change and/or negative impacts caused by an activity so that it can continue to support the lives of humans and other living things. In practice, control of changes in the use of protected land cannot be handled, either in forest areas or outside forest areas that have a protected function. - In Government Regulation 26 of 2008, article 7, paragraph 2 mandates the restoration and improvement of the function of protected areas that have decreased due to the development of cultivation activities to realize and maintain the balance of the regional ecosystem. In practice, authorities have been unable to control the use of or restore several protected lands within and outside forest areas to improve their function as protected areas. - Government Regulation 26 of 2008, Article 8, Paragraph 1 mandates controlling the cultivation development to ensure it does not exceed the carrying and environmental capacity. In practice, controlling cultivation development exceeds the environmental carrying capacity, especially in the upstream areas of the watershed, both in forest areas and outside forest areas. - In Government Regulation 26 of 2008, article 8, paragraph 3, mandates the limitation of the development of cultivation activities built in disaster-prone areas to minimize the

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No	Regulation	Problems in the Practice of Implementing Regulations
		potential for disasters and potential losses due to disasters. In practice, authorities cannot control cultivation activities in protected and disaster-prone areas. - In Government Regulation 26 of 2008, article 9, paragraph 1, provides a mandate for the preservation and improvement of environmental functions and carrying capacity to maintain and improve ecosystem balance, preserve biodiversity, maintain and improve the function of area protection, preserve the uniqueness of the landscape, and preserve national culture. In practice, nature protection areas face challenges from illegal land conversion. These nature protection areas are generally upstream areas of the watershed. - Government Regulation 26 of 2008, article 9, paragraph 2, provides a mandate on strategies for preserving and improving the function and carrying capacity of the environment, including preventing the use of space in National strategic areas that have the potential to reduce the protected function of the area. In reality, land use in National strategic areas (conservation forests as National protected areas) has problems with illegal land use.
9	Law 17 of 2019 concerning Water Resources	- This law has regulated water resources conservation, water resources utilization, water damage control, water resources patterns as a planning aspect, water resources database information system, and community participation. However, water conservation from vegetative, agronomic, and community participation aspects has not been specifically discussed as related to this; the legal basis used is Law 37 of 2014 concerning Land and Water Conservation. - The weakness of this law is that it does not discuss water resource conservation from a green water policy perspective.
10	Law 11 of 1974 concerning Irrigation	- Law 11 of 1974 does not regulate water conservation, utilization, water damage control, water resources patterns for planning aspects, and community participation. To fill the gap in water resources conservation affairs, it can use the current legal basis of Law 37 of 2014 concerning Land and Water Conservation. For matters of community participation and community empowerment that are not regulated in Law 11 of 1974, currently, Government Regulation 37 of 2012 on Watershed Management, articles 57 to 63, can be used. Management of Natural Resources Information Systems, currently Government Regulation 37 of 2012 on Watershed Management, articles 64 to 66, can be used. The mandate on natural resources institutions such as the Natural Resources Council (National or Provincial) and the Natural Resources Management Coordination Team can use institutions such as the Watershed Forum (National and Provincial levels as well as Regency/City) and the Indonesian Soil and Water Conservation Society as a coordination forum because they

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No	Regulation	Problems in the Practice of Implementing Regulations
		have a legal basis, namely Government Regulation 37 of 2012 on Watershed Management and Law 37 of 2014 on Soil and Water Conservation. - The weakness of Law 37 of 2014 on Land and Water Conservation is that it does not discuss water resource conservation in terms of large-scale blue water infrastructure policies such as dams, artificial lakes, and the like. The Land and Water Conservation Law also does not discuss groundwater conservation.
11	Law 32 of 2009 concerning Environmental Protection and Management	- Law 32 of 2009 Article 15 mandates that the government and regional governments are required to prepare and implement a Strategic Environmental Assessment (SEA) as a reference for regional development policies and plans as well as a reference for preparing the spatial plan, long-term development plan, and mid-term development plan both at the center and in the regions. However, the SEA document is used ineffectively as a reference for regional development and spatial planning policies. - In Law 32/2009, Article 17 mandates that if the SEA results state that the carrying capacity has been exceeded, then the policies, plans, and/or development programs must be revised following the SEA recommendations and all efforts and/or activities that have exceeded the carrying capacity and carrying capacity of the environment are no longer permitted. However, in its implementation, the SEA has not been fully used as a controlling instrument, for the environment's carrying capacity affects the sustainability of the watershed.

Source: Analysis Results, 2021

Synthesis of Water Resources Conservation Policy in Indonesia. In the last two government periods, President SBY and President Jokowi promoted water resource conservation policies during their respective administrations through the Ministry of National Development Planning (PPN)/Bappenas, which in the national mid-term development plan 2010-2014, national mid-term development plan 2015-2019, and national mid-term development plan 2020-2024. In the national mid-term development plan 2010-2014 (Presidential Regulation 5 of 2010), various programs were implemented primarily by three ministries, prioritizing the handling of conservation and management of water resources, including the Ministry of Public Works, the Ministry of Forestry, and the Ministry of Agriculture.

The National Mid-Term Development Plan 2010–2014 mandated the Ministry of Public Works to prioritize the construction and rehabilitation of reservoirs. The recorded development targets for 2010-2014 include increasing the availability and maintaining the sustainability of water through the construction of 12 reservoirs and 158 reservoirs, the rehabilitation of 29 reservoirs and 298 reservoirs, the construction of 7 reservoirs to overcome the danger of flooding in the Bengawan Solo River Basin, as well as flood control facilities in the East Flood Canal. During the 2010–2014 period, the Ministry also targeted improvements in raw water infrastructure services, as well as the development and management of irrigation networks, swamps, and other related systems. The Ministry of Forestry in the period 2010-2014 emphasized forest and land rehabilitation as the main

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activity to support the policy of water resource conservation with a vegetative approach. Some of the activities carried out include forest and land rehabilitation and land reclamation in priority watersheds, development of social forestry to support community-based watershed management, development of forest plant seeds to support forest and land rehabilitation in watersheds, and strengthening watershed management through the preparation of integrated IWMP in 108 priority watersheds.

The Ministry of Agriculture from 2010-2014 emphasized the rehabilitation of irrigation infrastructure, although watershed conservation activities upstream were also one of the activities of the Ministry of Agriculture during that period. Several activities carried out by the Ministry of Agriculture during this period include increasing the availability of irrigation water for agriculture through the development of small-scale alternative water sources (rural irrigation, development of groundwater sources, surface water pumping), developing water conservation by developing reservoirs, check dams, infiltration wells and conserving 160,000 ha of upstream watersheds in the context of climate adaptation efforts.

The Ministry of Energy and Mineral Resources in the 2010-2014 period had a policy in the field of water resource conservation, including: conducting groundwater management through groundwater tax inventory and determining groundwater utilization zones, increasing the utilization of research results, investigations and mapping of geological and groundwater fields to obtain information and data on the number of clean water wells for residents in remote villages and areas with water shortages, providing recommendations for the conservation of geological and groundwater protected areas to support spatial management, spatial data/hydrogeological maps on a scale of 1: 250,000, spatial data/groundwater basin maps on a scale of 1:100,000, spatial data/groundwater conservation maps, determining groundwater utilization zones through groundwater tax information in 33 provinces and conducting an inventory of investments in the production of beverage industries using groundwater as raw material.

During President Jokowi's term, the national mid-term development plan 2015-2019 (Presidential Regulation 2 of 2015) has encouraged water resource conservation policies, specifically because it is part of the government's three main priorities, including water security, food security, and energy security policies. In the national mid-term development plan 2015-2019, the Ministry of Public Works and Public Housing also emphasizes the construction and rehabilitation of reservoirs. The 2015-2019 development targets include the construction of 45 reservoirs and 216 reservoirs for water resources; rehabilitation of 11 reservoirs and 143 reservoirs for water resources; increasing water absorption and natural capacity with rehabilitation of rivers, lakes and swamps; protection of natural water sources; increasing water quality; increasing irrigation networks under the authority of the central and regional governments; and the construction and rehabilitation of raw water infrastructure are also targets of the Ministry of Public Works and Public Housing in the 2015-2019 period.

The Ministry of Environment and Forestry in the 2015-2019 period emphasized forest and land rehabilitation as the main activity to support water resource conservation policies with a small-to-medium-scale vegetative and civil engineering approach. Several activities carried out include Restoring the health of 15 priority watersheds and internalizing 108 integrated IWMP that have been compiled into the spatial plan; increasing rehabilitation and land and water conservation efforts to reduce critical land for watershed health and protection of springs, especially in 15 priority watersheds through rehabilitation activities; construction of reservoirs, control dams, and small-scale retaining dams in upstream areas. The Ministry of Agriculture in the 2015-2019 period emphasized the rehabilitation of agricultural irrigation infrastructure. Several activities carried out

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by the Ministry of Agriculture in this period include increasing the availability of irrigation water to support agricultural production through the construction of irrigation facilities, construction of reservoirs ditch dams, development of small-scale alternative water sources, strengthening the institutions of water-using farmers, supporting irrigation water management and repairing 3 million ha of damaged irrigation.

The Ministry of Energy and Mineral Resources in the 2015-2019 period has policies related to the utilization and conservation of water resources, including: increasing the utilization of new water-based energy by increasing the installed capacity of hydroelectric power plants from 3.94 GW to 6.88 GW; determination of hydroelectric power managers; improving the provision of clean water through groundwater drilling and increasing data and information and recommendations for groundwater management; construction of Semangka Hydroelectric Power Plant, Jatigede Hydroelectric Power Plant, Supiori Hydroelectric Power Plant, Urumuka Hydroelectric Power Plant, Besahan Hydroelectric Power Plant, Long Sempajang Hydroelectric Power Plant, Redelong Hydroelectric Power Plant, Sidikalang Hydroelectric Power Plant, Asahan Hydroelectric Power Plant and Masang Hydroelectric Power Plant.

Table 3. Policies Related to Cross-Sectoral Water Resources Conservation for the period 2010-2019

Ministry of Public Works and Housing	Ministry of Environment and Forestry	Ministry of Agriculture	Ministry of Energy and Mineral Resources
Policy Targets for 2010-2014: - Increasing the availability and maintaining the sustainability of water through the construction of 12 reservoirs and 158 ponds and the rehabilitation of 29 reservoirs and 298 ponds - Controlling the danger of flooding and increasing the availability of water in the Bengawan Solo River Basin by building seven reservoirs - Development and management of	**Policy Targets for 2010-2014:** - Forest and land rehabilitation and land reclamation in priority watersheds - Development of social forestry to support community-based watershed management - Development of forest plant seeds to support forest and land rehabilitation in watersheds - Strengthening watershed management through the preparation of IWMP in 108 priority watersheds	**Policy Targets for 2010-2014:** - Increasing the availability of irrigation water for agriculture through the development of small-scale alternative water sources (rural irrigation, groundwater source development, surface water pumping), development of water conservation by developing reservoirs, check dams, and infiltration wells. - Conservation of upstream	**Policy Targets for 2010-2014:** - Groundwater management development through groundwater tax inventory and determination of groundwater utilization zones. - Increasing the utilization of research results, investigations and mapping of geological and groundwater fields to obtain information and data on the number of drilled wells as sources of clean water for residents in remote villages and areas

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Ministry of Public Works and Housing	Ministry of Environment and Forestry	Ministry of Agriculture	Ministry of Energy and Mineral Resources
irrigation networks, swamps, and other irrigation networks - Improving raw water infrastructure services - Flood control by building flood management facilities in the East Flood Canal and the Bengawan Solo River Basin **Policy Targets for 2015-2019:** - Construction of 45 reservoirs and 216 water reservoirs - Rehabilitation of 11 reservoirs and 143 water reservoirs - Increased water absorption and natural capacity by rehabilitating rivers, lakes, and swamps - Protection of natural water sources - Improvement of water quality - Improvement of irrigation networks under major and regional authorities - Raw water infrastructure is built and rehabilitated	**Policy Targets for 2015-2019:** - Restoration of the health of 15 priority watersheds and internalization of 108 IWMP into the spatial plan - Increasing rehabilitation and land and water conservation efforts to reduce critical land for watershed health and protection of springs, especially in 15 priority watersheds through rehabilitation activities, construction of reservoirs, control dams, small-scale retaining dams in upstream areas, and increasing data for management, especially in 15 priority watersheds - Increasing the quantity and quality of forest plant seeds to support the reduction of critical land and restoration of watershed health, especially in 15 priority watersheds,	watersheds of 160,000 ha in the context of climate adaptation efforts **Policy Targets for 2015-2019:** - Increasing the availability of irrigation water to support agricultural production through the construction of irrigation facilities, construction of reservoirs, ditch dams, development of small-scale alternative water sources, strengthening of water-using farmer institutions, support for irrigation water management, and development of the WISMP program[1]; - Repairing 3 million hectares of damaged irrigation	with water shortages, providing recommendations for the conservation of geological and groundwater protected areas to support spatial management, spatial data/hydrogeological maps on a scale of 1: 250,000, spatial data/groundwater basin maps on a scale of 1:100,000, spatial data/groundwater conservation maps. - Determination of groundwater utilization zones through groundwater tax information in 33 Provinces - Inventory of investment in the production of beverage industries using groundwater as raw material **Policy Targets for 2015-2019:** - Increasing the utilization of new water-based energy by increasing the installed capacity of hydroelectric power plants from 3.94 GW

[1] Water Resources and Irrigation Sector Management Program

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Ministry of Public Works and Housing	Ministry of Environment and Forestry	Ministry of Agriculture	Ministry of Energy and Mineral Resources
	and restoring inland water ecosystems with the target of increasing the quality of 15 priority lakes - Increase the capacity of protected forest management units		to 6.88 GW, determining hydroelectric power managers - Increasing the provision of clean water through groundwater drilling and improving data and information, as well as recommendations for groundwater management - Construction of Semangka Hydroelectric Power Plant, Jatigede Hydroelectric Power Plant, Supiori Hydroelectric Power Plant, Urumuka Hydroelectric Power Plant, Besahan Hydroelectric Power Plant, Long Sempajang Hydroelectric Power Plant, Redelong Hydroelectric Power Plant, Sidikalang Hydroelectric Power Plant, Asahan Hydroelectric Power Plant, and Masang Hydroelectric Power Plant

Source: Processed from GoI, 2015 and GoI, 2010

In Presidential Regulation 18 of 2020 concerning the national mid-term development plan 2020-2024, it is stated that the policy targets related to cross-sectoral water resource conservation are

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more of a continuation of the national mid-term development plan 2015-2019. In this Presidential Regulation, the achievements related to water resources in the 2015-2019 period are the construction of 16 new dams, 1 million Ha of new irrigation, 330 sediment and lahar controllers, 30 m3/second additional raw water capacity, 3 million ha of irrigation, and existing rehabilitation. In addition, the government built 1,212 reservoirs and 1,485 flood control structures and coastal protections. During his second term, President Jokowi aimed to complete the unfinished targets from the previous period.

The 2020-2024 policy direction regarding water resources is to increase the quantity/resilience of water to support economic growth implemented with the following strategies: (1) Strengthening the protected function of forest areas; (2) Sustainable forest management; (3) Provision of water supply to support agriculture and inland fisheries; (4) Provision of raw water supply to support priority areas; (5) Maintenance, restoration, and conservation of water resources and their ecosystems including efforts to revitalize lakes and green infrastructure; and (6) Development of multipurpose dams. Infrastructure support for water security includes raw water provision in priority areas by prioritizing disadvantaged, outermost, and remote areas; small outermost islands; urban areas; strategic areas; the northern coastal areas of Java; and water-prone areas. The value of water productivity can be increased through the efficient use of water, especially in agriculture.

Infrastructure such as dams provide optimal services to meet raw water needs, irrigation supplies, flood reduction, and Hydroelectric Power Plants. Maintenance, restoration, and conservation of water resources in the 2020-2024 period focus on 15 national priority lakes in the form of the revitalization of Lake Singkarak, Lake Kerinci, Lake Batur, Lake Maninjau, Lake Limboto, Lake Rawa Danau, Lake Matano, Lake Rawa Pening, Lake Tempe, Lake Sentarum, Mahakam Cascade Lake (Semayang-Melintang-Jeumpang), Lake Tondano, Lake Poso, Lake Toba, and Lake Sentani.

The presentation of the synthesis above shows that, in general, policies related to water resources conservation are to ensure sustainability. Given the complexity of the problems and the diversity of tribes, cultures and local policies in each region, future water resources conservation policies in Indonesia must adopt an integrated approach to sustainable water resources management, including protection of water catchment areas, reduction of leakage in water distribution systems, and efficient use of water in agriculture, industry and households.

Challenges of Water Resources Conservation Planning. Philosophically, water resources are a gift from God that is needed in every aspect of life and as a source of livelihood. The 1945 Constitution mandates that the state guarantee every person's right to access water for basic daily needs to support a healthy, clean, and productive life. To fulfill all of this, water resource conservation will face a conflict of interest.

The challenges of concern in planning water resource conservation in the future are related to regulation synchronization and linking them to the large target of Indonesia's water security in 2045. In addition, the involvement of the private sector is also a crucial breakthrough that is expected to create a balance point in the implementation of water resources by the state, regional/state-owned enterprises, and the private sector to ensure water availability for the community and business activities in Indonesia. There is a disparity in investment needs to meet water needs in Indonesia, where in the period 2015 - 2019, it reached a value of around IDR 274.8 trillion. Alternative funding sources from donors and the private sector are urgently needed to cover the gap. The continuity of this funding also requires regulations that ensure the legality of its implementation in the field.

Water resources management must also realize synergy and harmonious integration between regions, sectors, and generations. The most challenging thing is integrating the management of

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water, land, and other related resources in a coordinated manner to maximize social, environmental, and economic functions to reach a harmonious realization. Water resource conservation design needs include efforts to protect, manage, and use sustainable water resources.

CONCLUSION

Stakeholders in the forestry/environment and water infrastructure sectors are likely familiar with the dualism of water resource planning documents in Indonesia, including those related to water resource conservation. This country has two papers prepared to reduce sectoral egos, as indicated by the involvement of multiple stakeholders, all sharing the same goal of achieving water security. The problem is related to the conductor/coordinator. The relevant Environmental and Forestry Agency coordinates the Integrated IWMP Document, while the relevant Water Infrastructure Agency coordinates the Water Resources Management Pattern Document. The fact that can be seen so far is that sectoral egos and regional egos still clearly dominate the development of these water resources, starting from the regulatory level and impacting policy. Not to mention related institutions, there are the Water Resources Council, Watershed Forum, Water Resources Management Coordination Team, Soil and Water Conservation Society, and others, all of which use the term "integrated." We must undertake a long, steep, winding journey to achieve integrated and sustainable water resource conservation for water security. Future efforts must emphasize a shared goal: to improve the livelihoods of many people and ensure sustainable environmental protection rather than merely fulfilling institutional duties and regulatory mandates.

The realization of water resources conservation is not running as fast as expected due to various challenges, such as public understanding that needs to be improved, the readiness of state institutions in cross-sectoral planning, and eliminating sectoral and regional egos that are not easy. The low achievement of the 2015-2019 period, which did not meet expectations, teaches us that, over the next 5 years, the government, private sector, and community must carefully and comprehensively design performance indicators and performance targets for water resource conservation implementers. The target of water resources conservation is not just to meet sectoral performance targets but must be balanced with having to be in one system that requires synergy between Ministries/Institutions and synchronization with local governments, the private sector, and the community. Strengthening public awareness for water efficiency, maintaining infrastructure, and ecosystem conservation need to be socialized in a massive and planned manner.

In synchronizing central and regional regulations, the authors recommend that the President and the House of Representatives actively encourage the achievement of synchronized laws, which should include rewards and punishments within one national development target for water resources conservation. Both institutions are encouraged to issue rules that synchronize the planning and budgeting process for water resources conservation comprehensively from the center to the regions. In addition, involving all components of society without marginalizing certain groups is recommended to support the target of water resources conservation, including implementing gender-responsive programs.

Water resource conservation has not been implemented comprehensively, both in policy and the implementation process. Concerning this, water resource conservation is to be made comprehensively from upstream to downstream by creating or strengthening existing institutions, one of which is intensifying a specific institution with complete authority that encompasses all sectors but is neutral. The active involvement of local governments is to optimize the resolution of water resource conservation in the future. It is considered that most of the water resource

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intervention areas are in local government areas. Integrated Watershed and River Basin Management integration has to be built thoughtfully, considering hydrological, ecological, social, and economic aspects. This approach involves the participation of various stakeholders, including the government, community, academics, and the private sector (business world). Therefore, strengthening the side of community empowerment and public awareness is a concrete step to save water as part of a visionary water resource conservation effort. It includes increasing public awareness of the importance of water resource conservation, education on wise water use, and active community participation in decision-making related to water resource management.

Continuity of monitoring and evaluation needs to be serious. Therefore, the institution that has this task and function must be able to coordinate and facilitate stakeholders in monitoring and evaluation implementation. This institution must also be able to carry out checks and balances when sectoral regulations implemented by water resource conservation implementers are about to kill other sectors. It is because water resource conservation should be the gateway to Indonesia's water security, not only a means of increasing conflicts of interest that will harm the country generally.

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