



Ministry of Public Works
Directorate General of Water Resources

Governing Indonesia's Water Resources: Managing the Lifeline of an Archipelagic Nation

Presented On:



Global Water Partnership Southeast Asia
Policy to Practice: Regional Exchange on
Integrated Water Resources Management

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WATER RESOURCES POTENTIAL IN INDONESIA

Total Potential Water
1.845.707,06
m³/year

INDONESIA (m ³ /year)	
Avability	Needs
1.845.707,06	926.332,11

Kalimantan	
Surplus	
Avability	Needs
615.845,67	113.820,08
Domestic, Municipal	1.043,12
Industry	417,25
Irrigation	13.929,18
Farming, Fishing	1.601,16

Sulawesi	
Surplus	
Avability	Needs
122.510,62	107.091,51
Domestic, Municipal	1.462,66
Industry	598,61
Irrigation	19.659,82
Farming, Fishing	2.305,19

Maluku	
Surplus	
Avability	Needs
35.346,51	4.210,72
Domestic, Municipal	175,66
Industry	90,48
Irrigation	328,48
Farming, Fishing	1,97

Sumatera	
Surplus	
Avability	Needs
454.226,19	264.318,37
Domestic, Municipal	5.255,09
Industry	2.627,54
Irrigation	51.666,31
Farming, Fishing	5.186,03

Java	
Defisit	
Avability	Needs
89.836,80	372.798,45
Domestic, Municipal	14.472,02
Industry	7.236,01
Irrigation	56.758,31
Farming, Fishing	8.796,76

Bali and Nusa Tenggara	
Defisit	
Avability	Needs
16.324,10	20.846,02
Domestic, Municipal	1.248,22
Industry	534,38
Irrigation	10.113,85
Farming, Fishing	225,02

Papua	
Surplus	
Avability	Needs
511.617,16	43.246,97
Domestic, Municipal	298,56
Industry	90,48
Irrigation	295,74
Farming, Fishing	2,81

- Total Potential Water: 1.845.707,06 m³/year
- Total Water Requirement 354.933,08 m³/year
- Java Island Experiencing the most severe water Deficit. Needs (95.383,92 m³/year) significantly outweigh Availability (89.836,80 m³/year)
- The highest water requirements in Indonesia are concentrated on Java Island. Data indicates that the Irrigation sector on Java Island is the largest nationally, 56.758,31 m³/year, and its Domestic and Industrial sector demand is also the highest at 21.708 m³/year

Metric (Billion m ³ /year)	Study 2016 (Data up to 2015)	Study 2022 (Data up to 2022)
Average Water Availability	2,78	2,97
Reliable Water Availability (Dependable Yield)	2,09	1,85

WATER RESOURCES MANAGEMENT CHALLENGES (1)

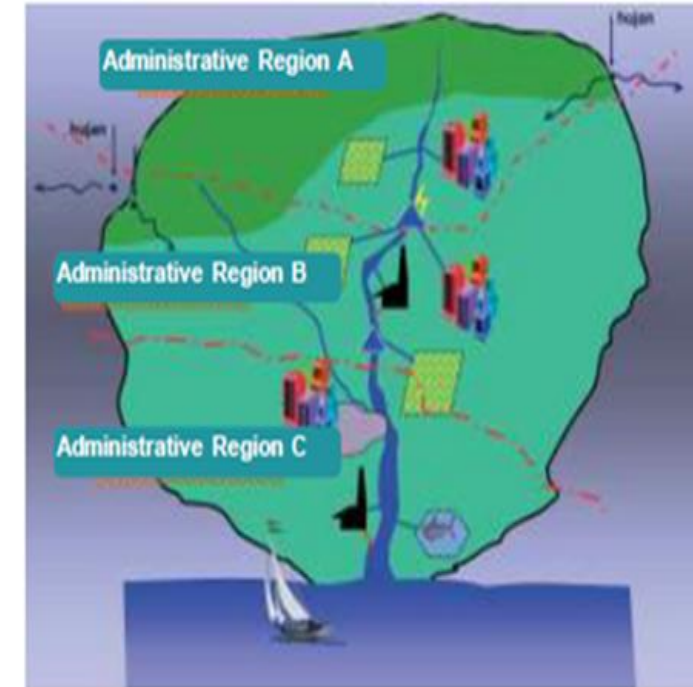
Legal Framework on Water Resource

Water Resources Law No. 17/2019:
Mandates Integrated Water Resources
Management (IWRM) as the core principle
work

National Water Resources Policy

Presidential Regulation No. 37/2023

- 1 Water Resource Conservation
- 2 Water Resource Utilization
- 3 Water Destructive Power Control



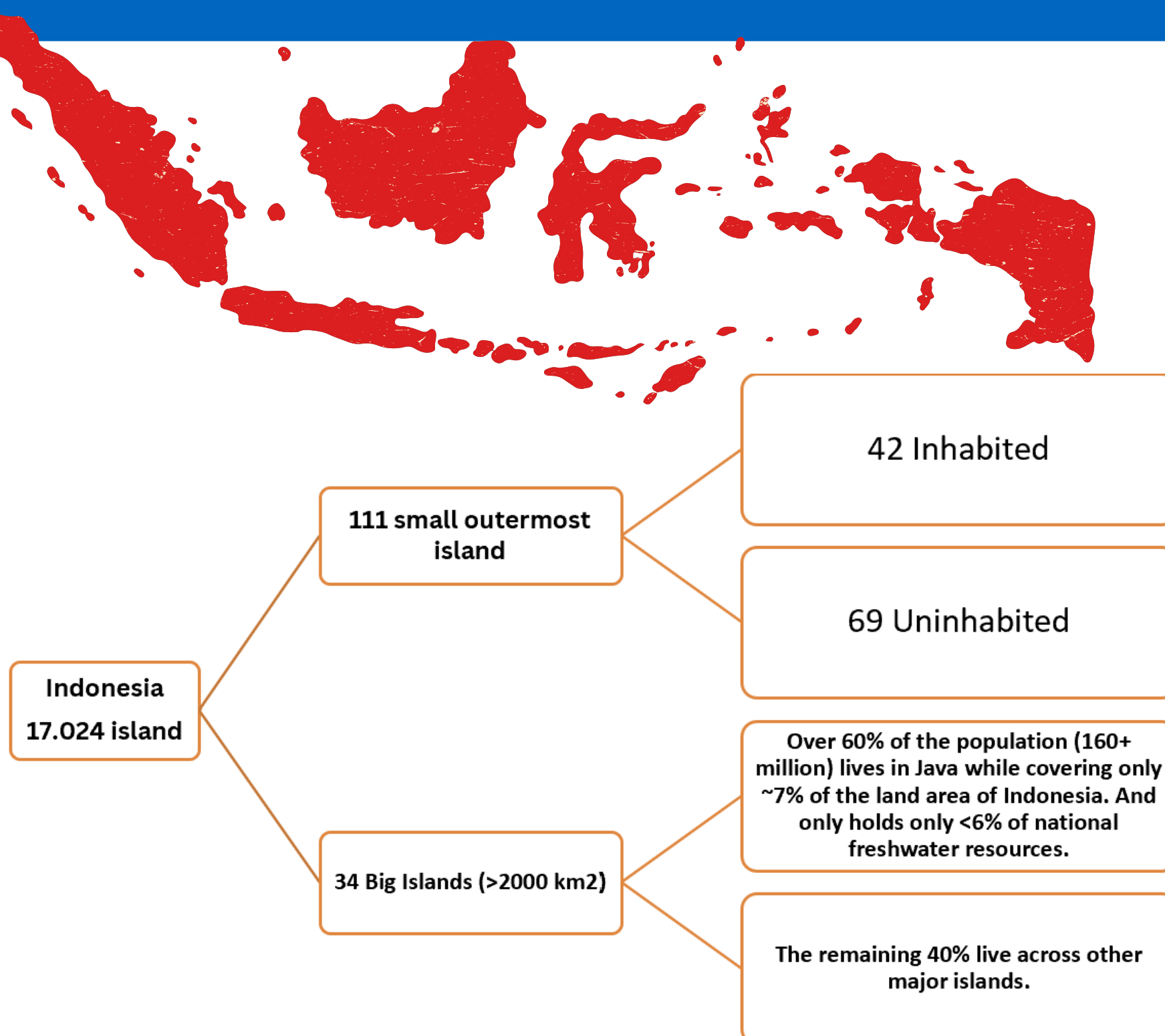
Information:

A river basin is a water resources management unit that encompasses one or more watersheds and/or small islands with an area of less than or equal to 2,000 km².

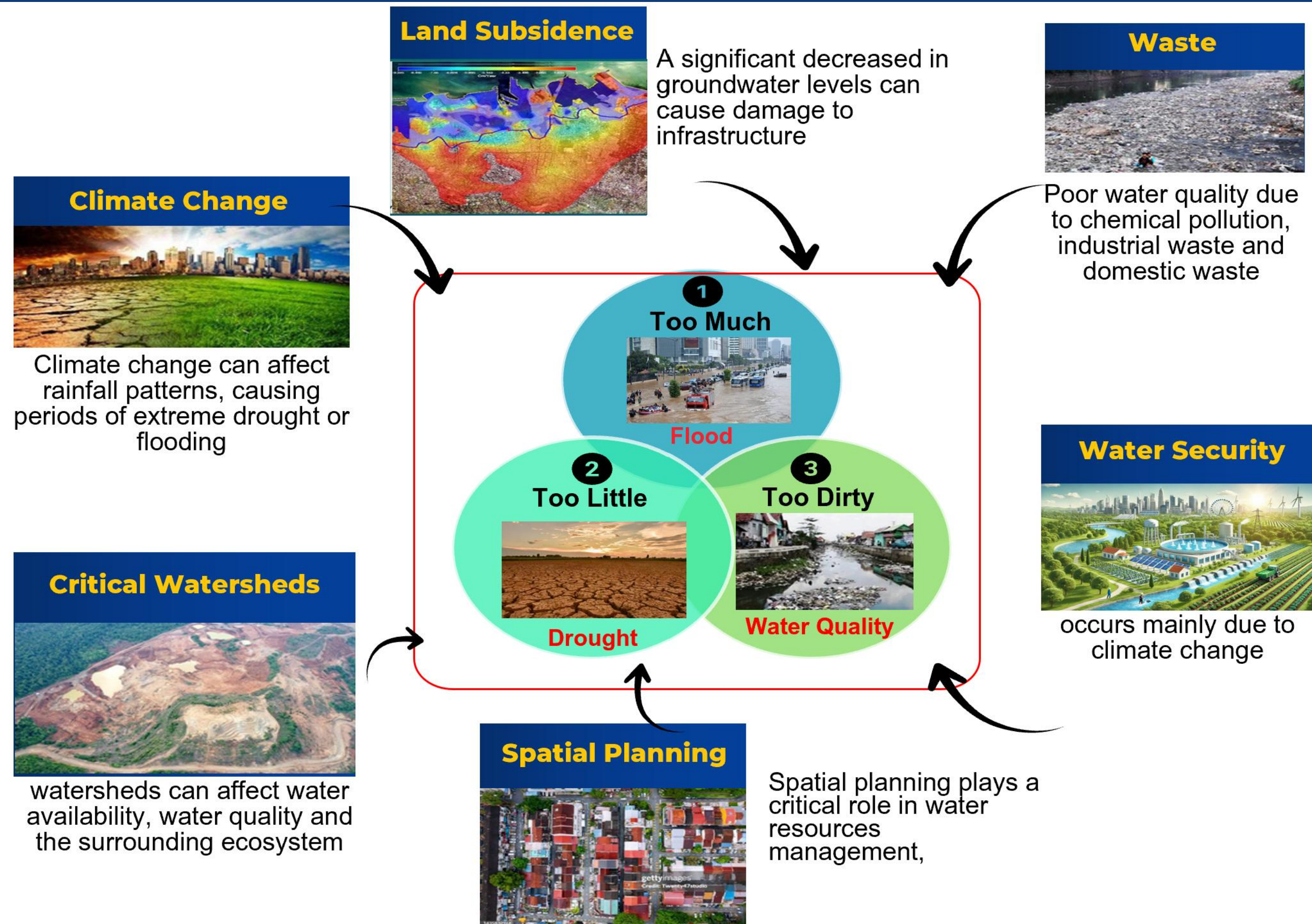
A single river basin may include one or more administrative regions (provinces) with an area of less than or equal to 2,000 km².

128 River Basin Territory

No.	Status of River Basin Territory (RBT)	Total of RBT	Authority
1	International Trans-Boundary RBT	5	Central Government
2	Trans-Province RBT	31	Central Government
3	National Strategic RBT	28	Central Government
4	Trans-Regency / District RBT	52	Provincial Government
5	One Regency / District RBT	12	Regencial Government
Total		128	



WATER RESOURCES MANAGEMENT CHALLENGES (2)



WATER RESOURCES MANAGEMENT CHALLENGES (3)

*The emergence of these problems provides an indication
THE ENVIRONMENTAL SYSTEM THAT SUPPORTS THE
SUSTAINABILITY OF THE HYDROLOGICAL CYCLE PROCESS
IS MEDIUMLY / EXPERIENCED DAMAGE*



**POTENTIAL
CONFLICT**

- Between regions
- Between sectors
- Between user groups
- Between individual users



IWRM

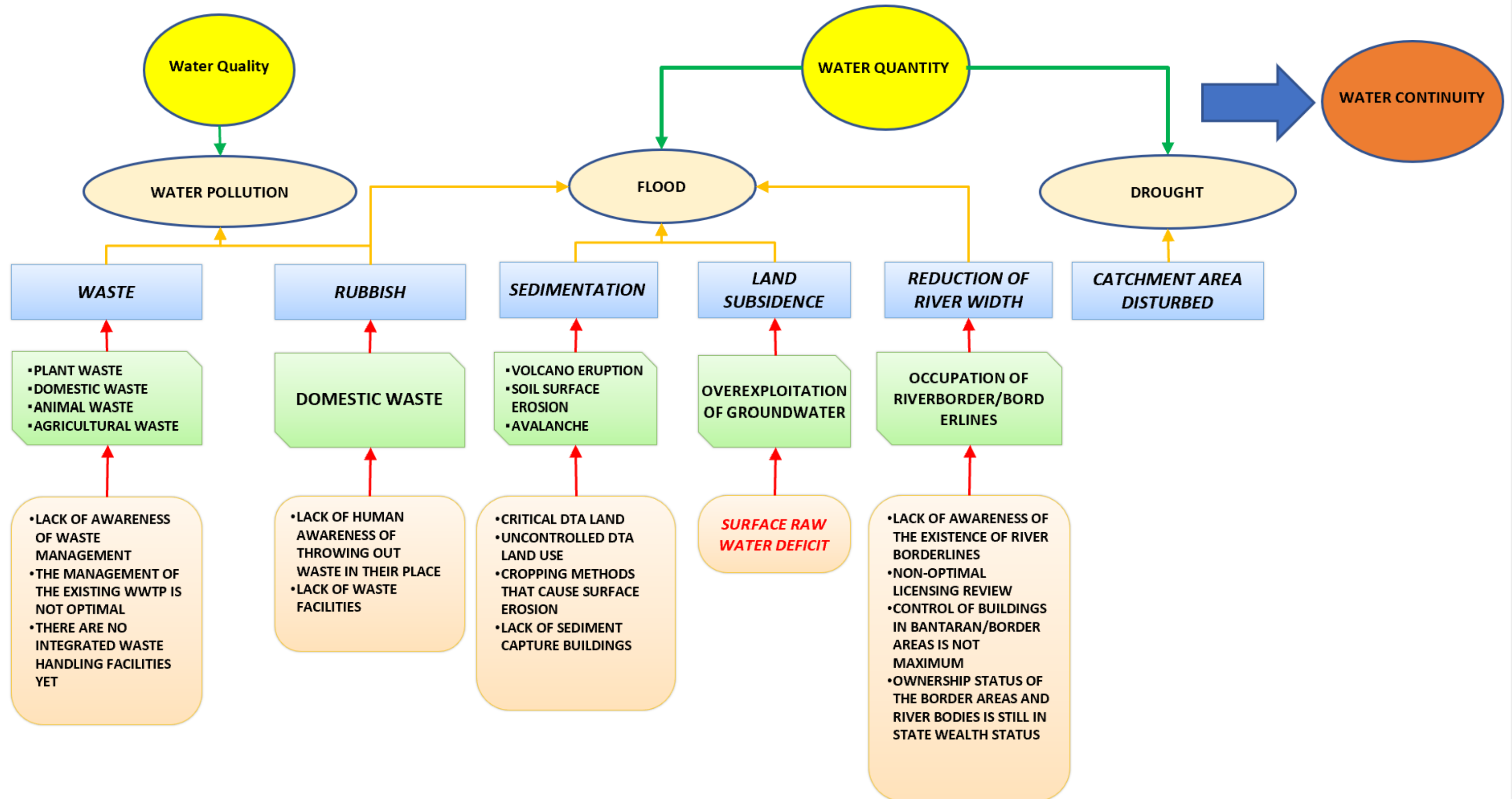
National Issue :

- 1)Water Security
- 2)Food Security
- 3)Energy Security
- 4)Global Climate Change.

Local Issue :

- 1)Water Body Pollution (Pollution from domestic, industrial, and agricultural waste)
- 2)Groundwater Over-extraction (Leading to a decline in groundwater levels and seawater intrusion in coastal areas)
- 3)Damage to River Ecosystems and Water Sources (Such as land-use change in river buffer zones and degradation of upstream forests)
- 4)Erosion and Sedimentation (Resulting from land degradation in water catchment areas)
- 5)Local Water Use Conflicts (Between sectors or among users at the local/regional level)

WATERSHED PROBLEM SCHEME

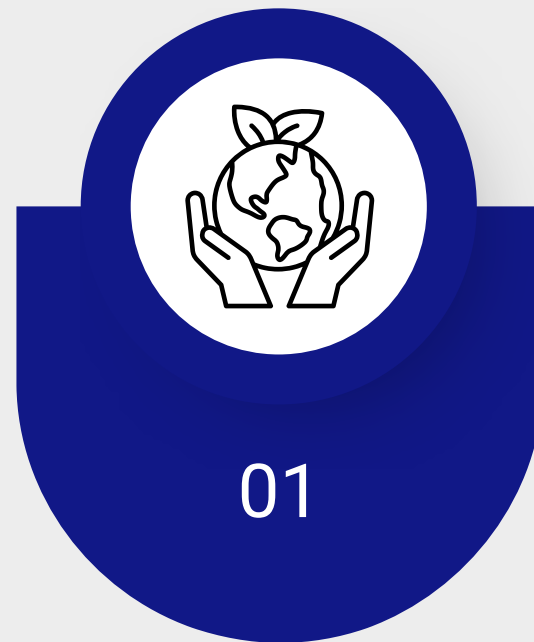


IWRM FRAMEWORK POLICY

Indonesia's Water Resources Law (Law No. 17/2019) and Government Regulation No. 30/2024 on Water Resources Management emphasize that water management should be holistic — covering conservation, utilization, hazard control, community empowerment, and governance.

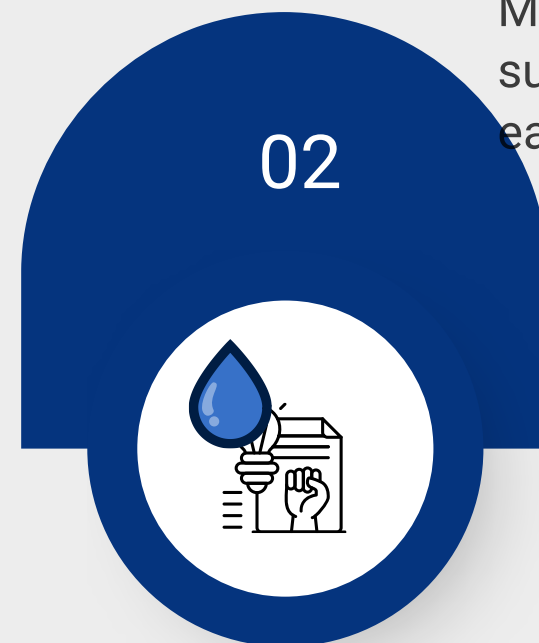
Water Resources Conservation

Conservation ensures the long-term availability and quality of water by maintaining hydrological balance and ecosystem



Water Resources Utilization

Utilization aims to balance water use among sectors (agriculture, domestic, industry) while maintaining efficiency and fairness.



Water-Related Hazard Control

Managing water-related hazards such as floods and droughts → early warning system



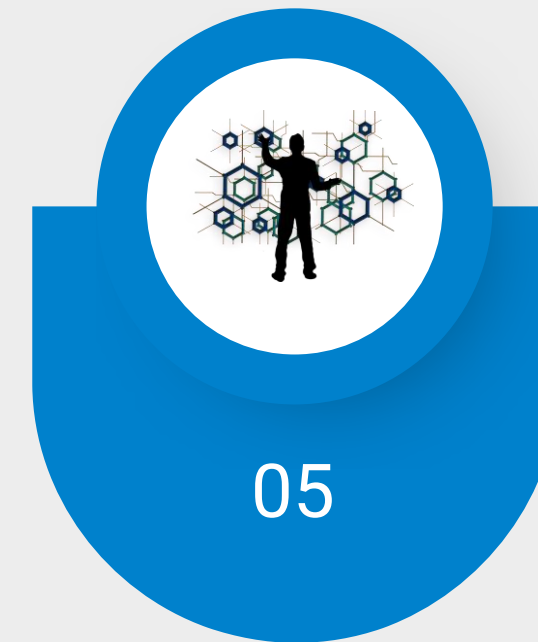
Community and Stakeholder Empowerment

Active participation of communities and stakeholders ensures local ownership, social equity, and shared responsibility in water management.



Governance and Water Information Systems

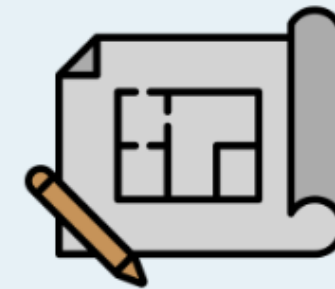
Effective water governance relies on transparent institutions and reliable data for coordinated decision-making.



The Link Between Water Resources Management (WRM/PSDA) & Spatial Planning (RTRW)



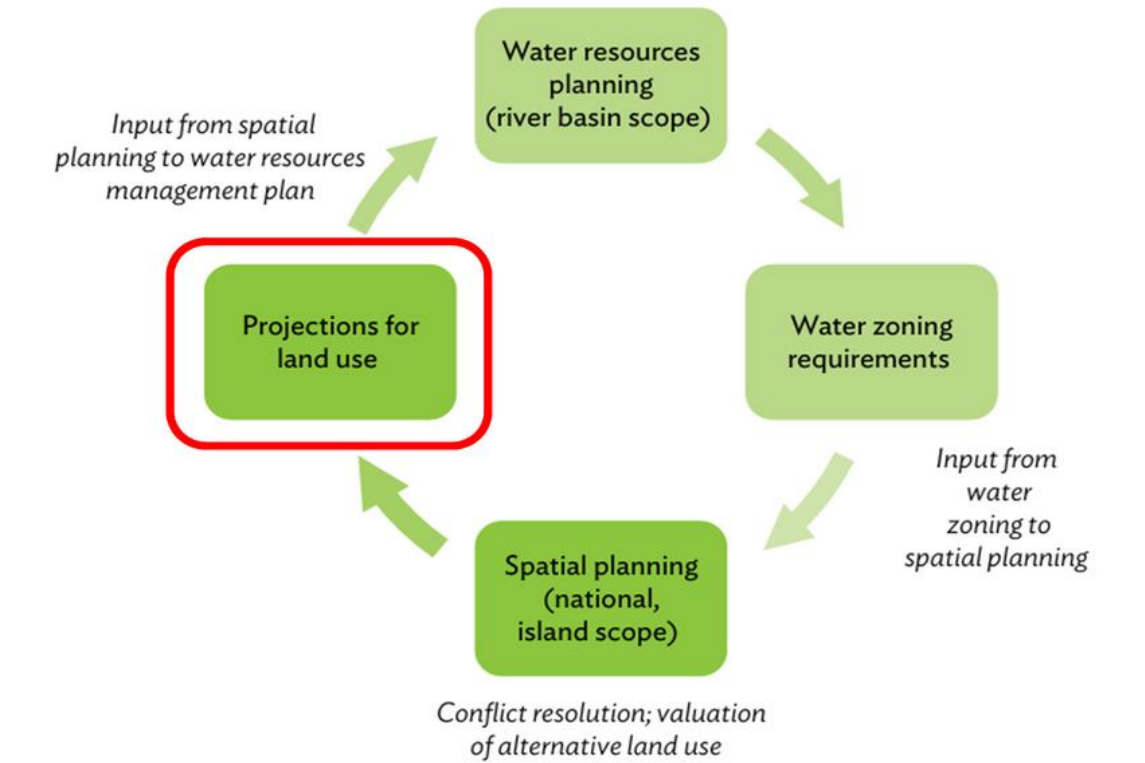
Water Resources Management (WRM/PSDA)



Spatial Planning (RTRW)

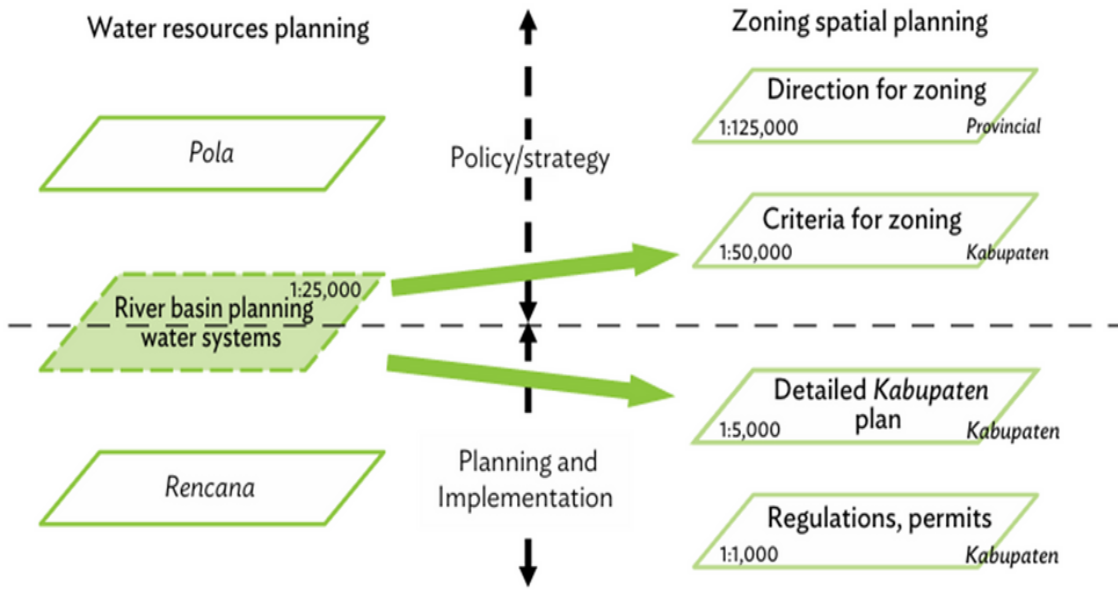
- WRM and Spatial Planning are fundamentally connected: land use determines water health, and water availability dictates land use potential.
- Spatial Plan → Impacts Water: The RTRW's designations for urban, agricultural, or forest areas directly affect runoff, pollution, and groundwater recharge.
- Water Resources Data → Informs Spatial Plan: WRM provides crucial data on water availability, flood zones, and groundwater protection areas. This data must be used to zone land in the RTRW, restricting harmful activities in sensitive areas.

Figure 2.6: Integrated Spatial Planning and Water Resources Planning



Source: 6 Cis Inception Report. 2010.

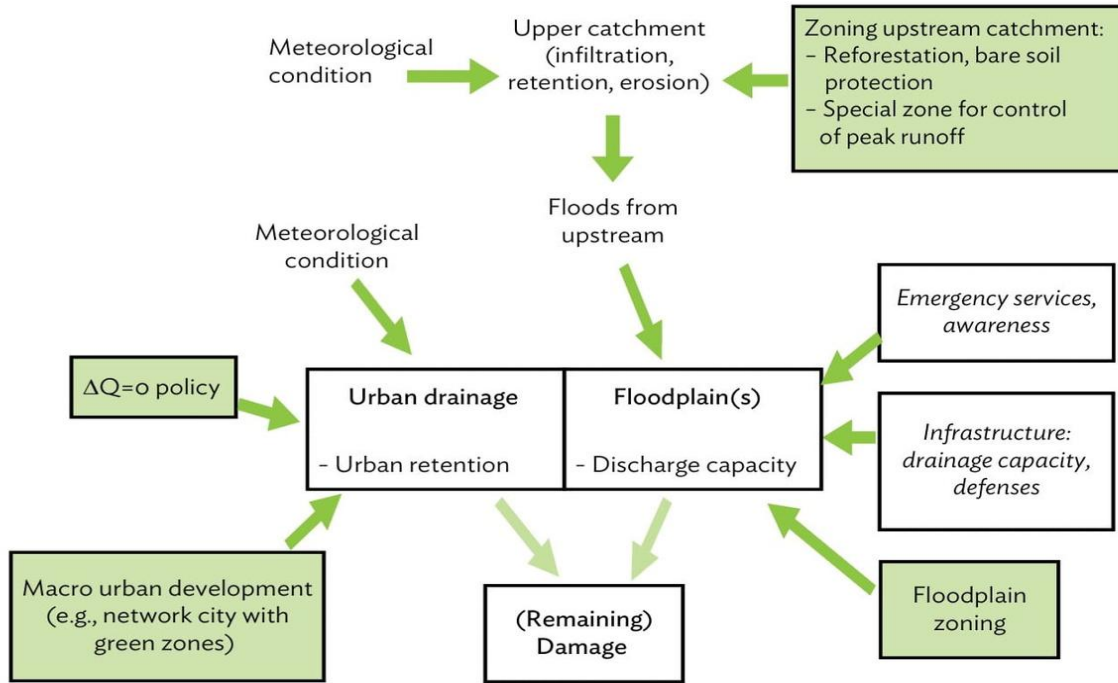
Figure 2.7: Water Zoning in Spatial Planning



Pola = Strategic WRM Framework Plan, Rencana = WRM Master Plan, Kabupaten = District: administrative level within the province.

Source: 6 Cis Final Report, Package B.2 (Spatial Planning). 2012.

Figure 5.13: Overview of Zoning for Flood Management



Source: P. Grashoff and R. Verhaeghe, personal communication.

Climate Change

CHANGES IN RAINFALL PATTERNS

INDONESIA IS INFLUENCED BY GLOBAL CLIMATE SYSTEMS:

- Monsoon
- El Niño-Southern Oscillation (ENSO)
- Dipole Mode Events (DME)



DME	ENSO
REOCCURRENCE PERIOD: 15 MONTHS (3-4 YEARS)	REOCCURRENCE PERIOD: 5-7 YEARS (TYPICALLY AROUND 4 YEARS)

TO REDUCE THE IMPACT OF GLDBAL CLIMATE VARIABILITY, INDONESIA MUST STRENGTHEN ITS LOCAL AND MICRO-CLIMATE RESILIENCE

Increase in Air Temperature and Decrease in Humidity

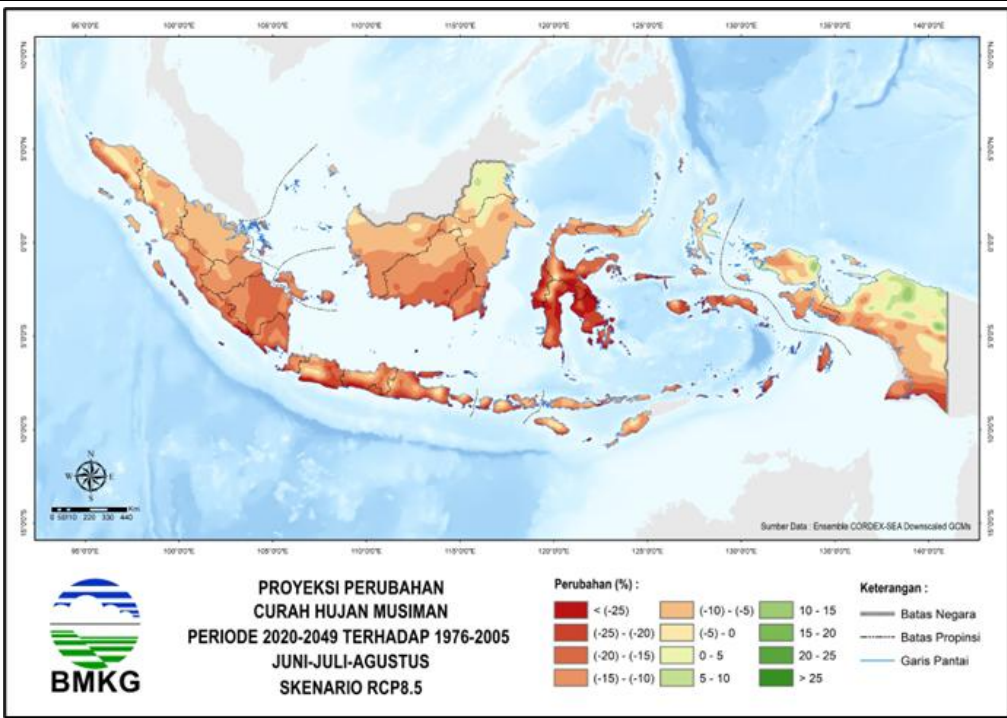
Graph of Average Air Temperature per Year (1976-2018)

27.5°C

Number of Monthly Heavy Rainfall (300-500 mm/month) and Very Heavy Raintall (>500 mm/month)

Rainfall Trends

- Extreme (return-period) rainfall tends to increase (by 0.4%-3.18%), while annual rainfall remains relatively stable (1975-2023)



Framework of Water Resources Planning in Indonesia

2. Water Resources Management Plan (Rencana PSDA)

- 20 - Year Period
- output: Follow-up Effort to Address Issues (Matrix of Basic Programs & Activities)
- River Basin Level



1. Water Resources Management Strategic Planning (Pola SDA)

- 20 - Year Period
- **Output:** List of Operational Policies
- River Basin Level



3. Program Plan (Rencana Program)

- 5 - Year Period
- **Output:** List of Thematic Activity Plans
- 5 - Year Period
- Line Ministry (K/L) or Local Government Agency (SKPD) Level



4. Activity Plan (Rencana Kegiatan)

- Annual
- **Output:** Description of Annual Activity Plans
- Line Ministry (K/L) or Local Government Agency (SKPD) Level



5. Annual Budget Work Plan (RKA-K/L or RKA - SKPD)

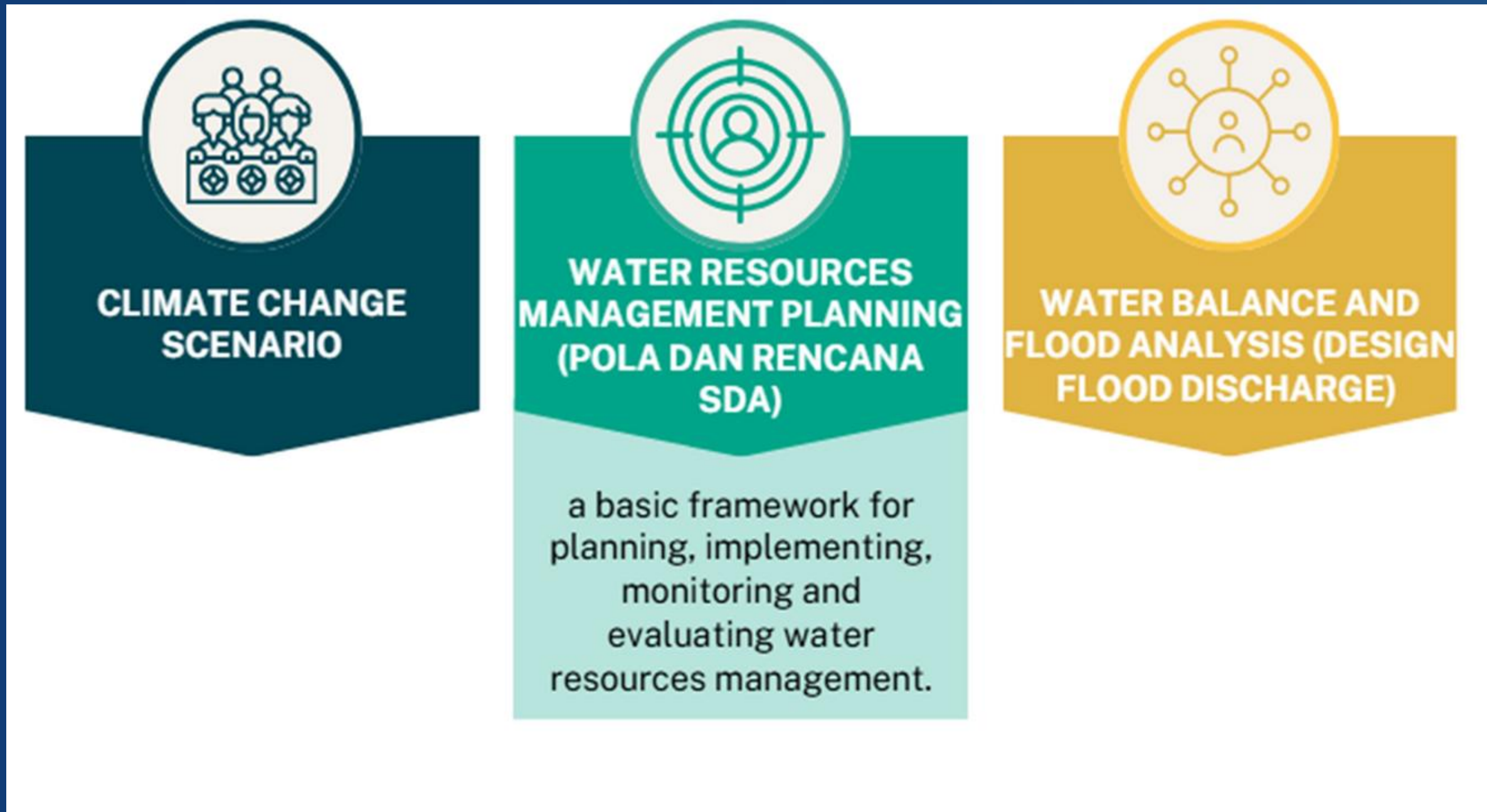
- **Output** Selected Activities For the Ongoing Year



BMKG confirms that climate change is intensifying extreme daily rainfall in Indonesia. This elevated potential for floods and landslides is projected to worsen over the coming decades, making urgent and comprehensive water resources management adaptation essential.

CLIMATE CHANGE - INDONESIA

WATER RESOURCES MANAGEMENT PLANNING



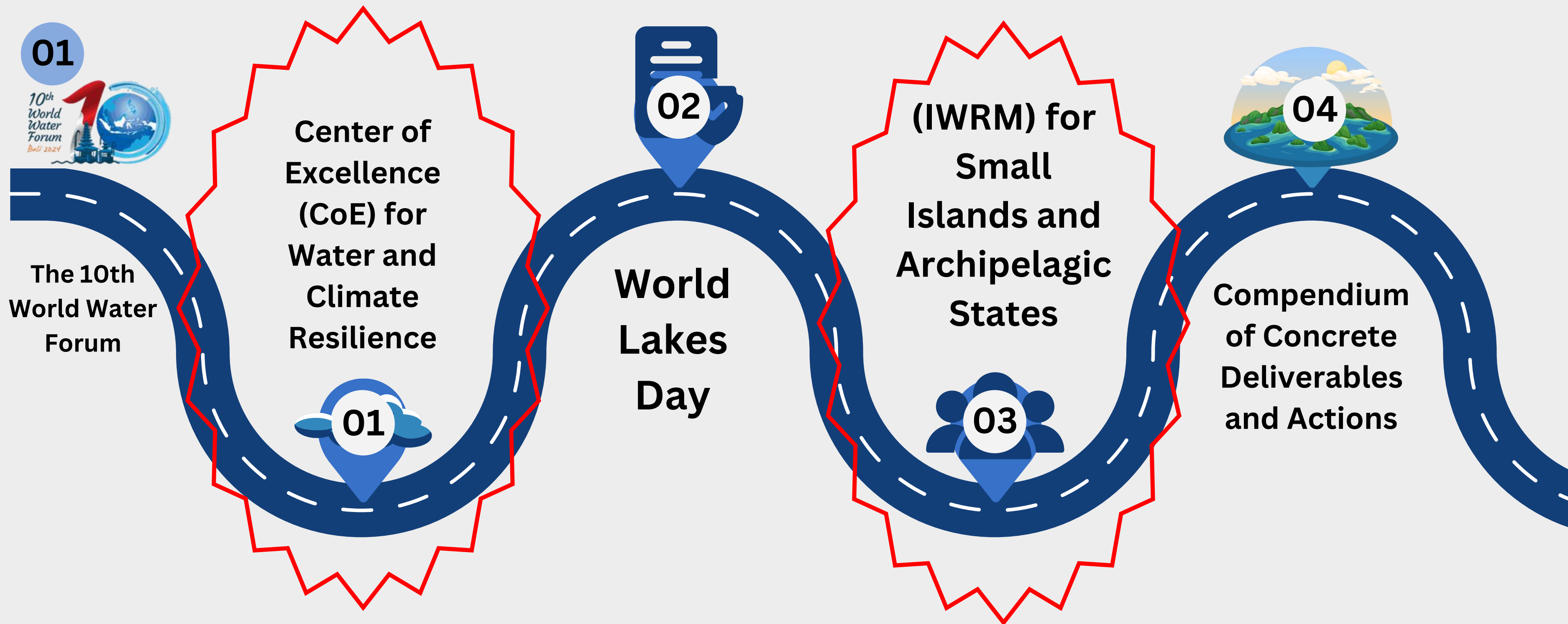
This **integrated scenario-based approach** ensures river basin strategies remain **adaptive, resilient and sustainable** amid changing climate and land use conditions

The role of hydrology in Integrated River Basin Management To Support SDG 6 :
Ensure Availability and sustainable management of water and sanitation for all

Key Outcomes the 10th World Water Forum (WWF-10)



Ministry of Public Works
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Strengthening International Collaboration through the Center of Excellence for Water and Climate Resilience

Connecting nations to advance sustainable water management and climate adaptation strategies.

Center of Excellence (CoE) for Water and Climate Resilience

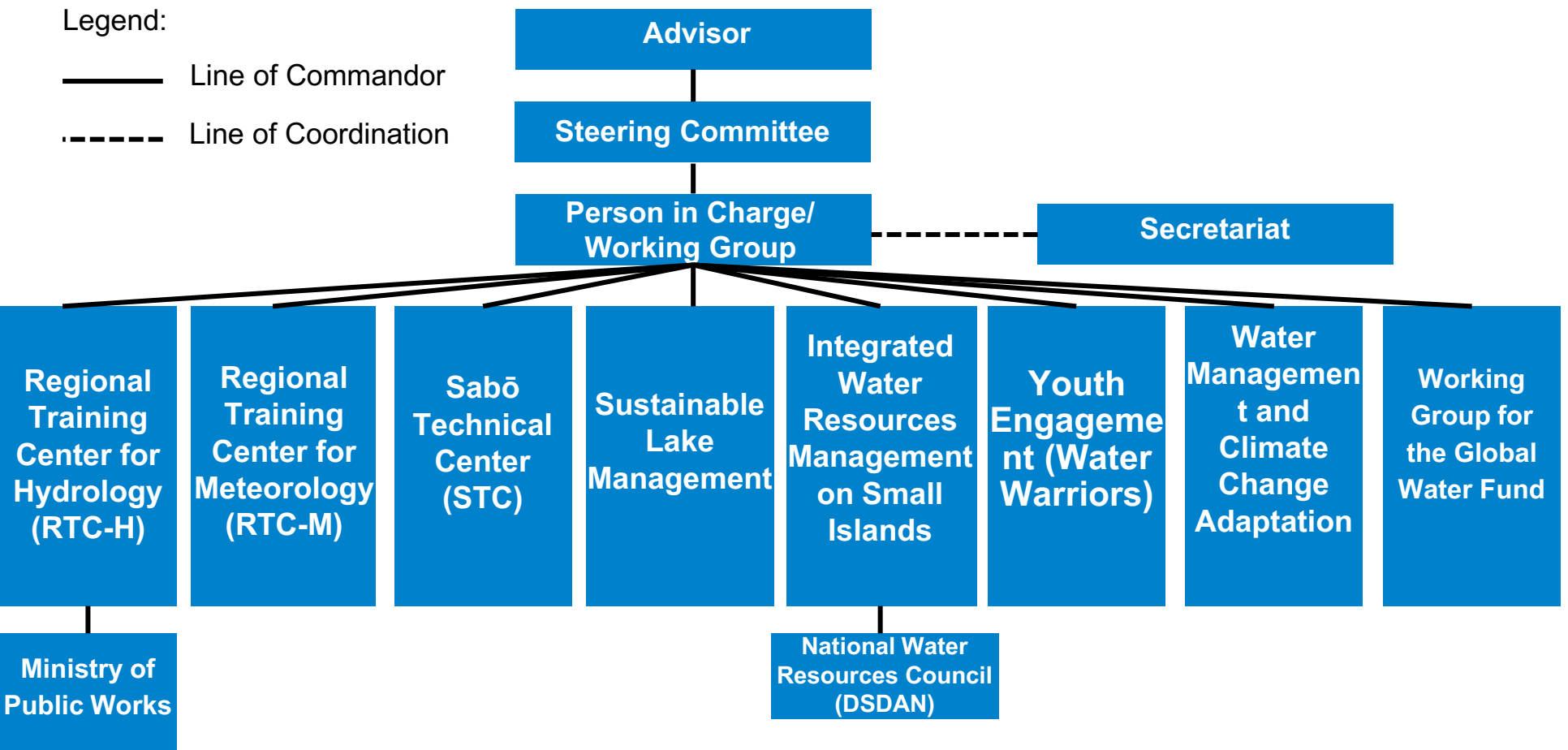
Indonesia proposed and gained consensus for the creation of a global Center of Excellence aimed at enhancing capacity building, knowledge exchange, and research collaboration in the fields of water management and climate change adaptation

TEAM FOR THE IMPLEMENTATION OF COE4WCR ACTIVITIES

Legend:

— Line of Commandor

- - - - Line of Coordination

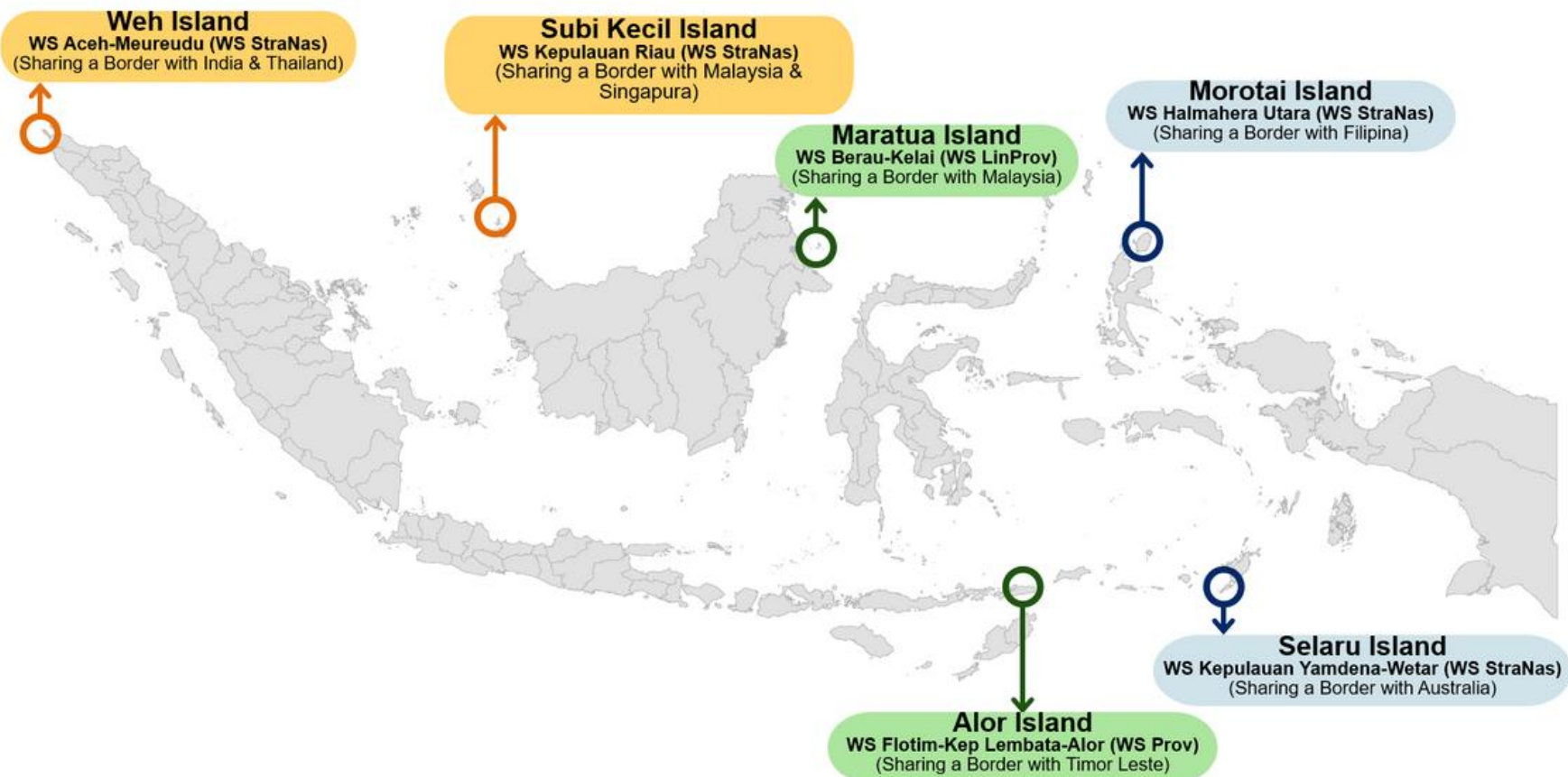


The Ministry of Public Works plays an active role in the WMO Regional Association V (RA-V) as the Regional Training Center for Hydrology (RTC-H), supporting the Center of Excellence on Water and Climate Resilience in addressing water resources management challenges under climate change.

International Collaboration and Knowledge Exchange in Water Resources Management

- Facilitating knowledge and experience exchange on integrated and sustainable water resources management through the Indonesia Regional Training Center for Hydrology (INA RTC-H).
- Supporting delegation visits from Nepal to strengthen cooperation and capacity development in water management.
- Sharing knowledge and best practices with NEPA – Afghanistan to enhance capabilities in water and environmental management.

Five Small-Island Pilot Projects-Pokja Air : Indonesia's WWF10 Follow-Up



Water–Climate Sector Linkages under GWP Strategy 2026–2030 (Focused on Climate Resilience)

1. Governance

Integrates national water policies and river basin management with climate adaptation plans to create adaptive governance that supports risk reduction and sustainable water resilience.

3. Partnerships & Inclusion

Builds multi-stakeholder partnerships connecting water and climate actors through joint platforms to create shared ownership and strengthen institutional cooperation.

2. Knowledge, Capacity & Digital Transformation

Combines hydrological and climate data systems through joint knowledge platforms and early warning systems to enable timely decision-making and climate-smart responses.

4. Implementation Programmes

Executes integrated water management and climate adaptation initiatives through global investment programmes to achieve operational synergy in delivering SDG 6 (Water) and SDG 13 (Climate Action).



This unified strategy merges systemic planning with actionable finance. It establishes resilient governance, data-driven systems, and inclusive partnerships to integrate water and climate management. Simultaneously, it mobilizes high-level commitments and blended investments to accelerate project pipelines, ensuring climate resilience and social inclusion are advanced through tangible on-ground implementation.

Strengthening National Resilience through Water, Food, and Energy Security — Alignment with Asta Cita Vision and National Medium-Term Development Plan (RPJMN)

The Water Security Index has become one of the development indicators in Astacita 2

The National Development Plan (RPJPN) 2025–2045	
National Priority 2	Strengthening the National Defense and Security System and Promoting National Self-Reliance through Food, Energy, Water, Sharia Economy, Digital Economy, Green Economy, and Blue Economy Self-Sufficiency
Development Target 4	Increased national self-reliance in sustainably meeting water needs through a Food, Energy, and Water (FEW) Nexus approach
Performance Indicator 10	National Water Security Index

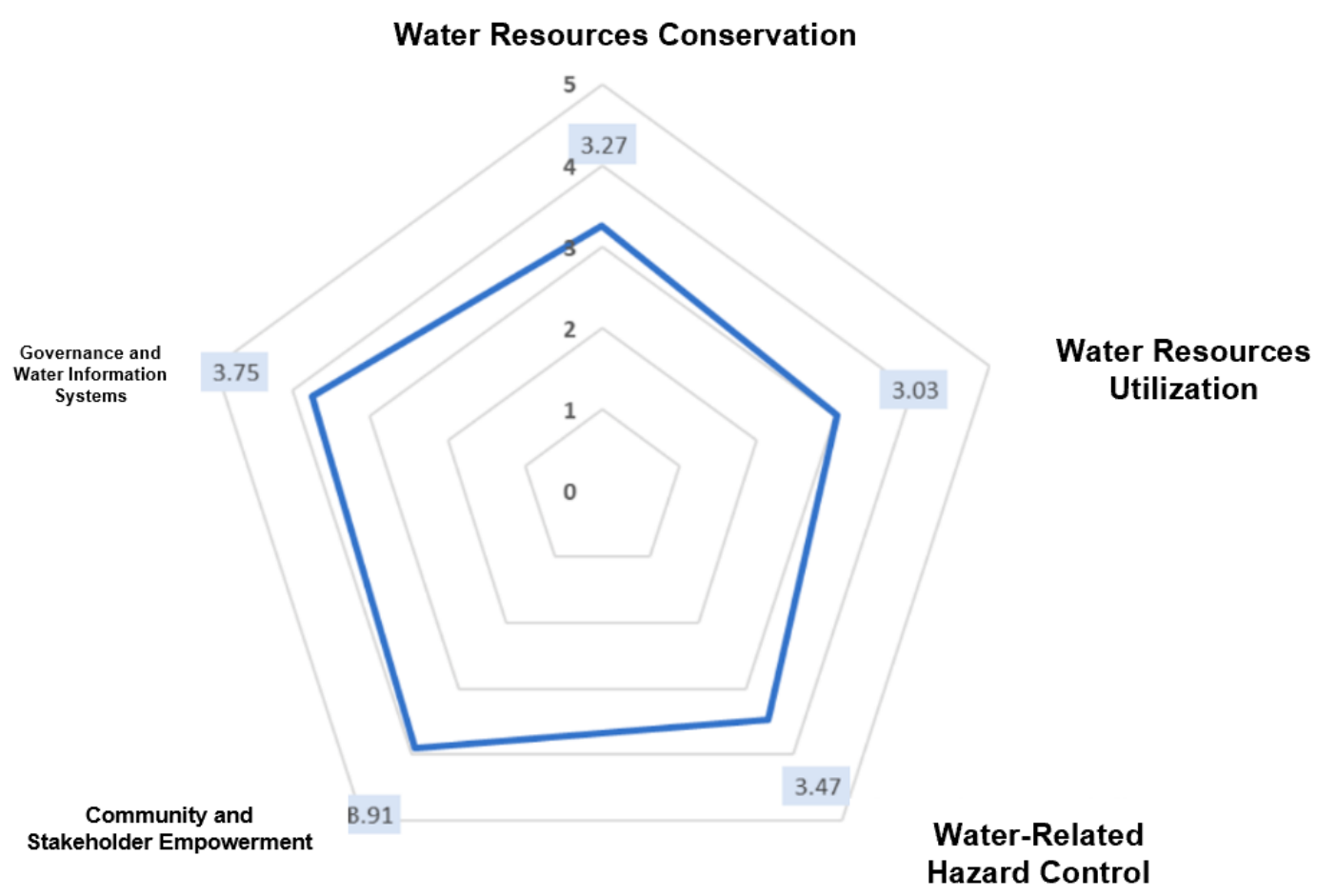


WATER SECURITY INDEX

to support strategies for improving natural resource management policies

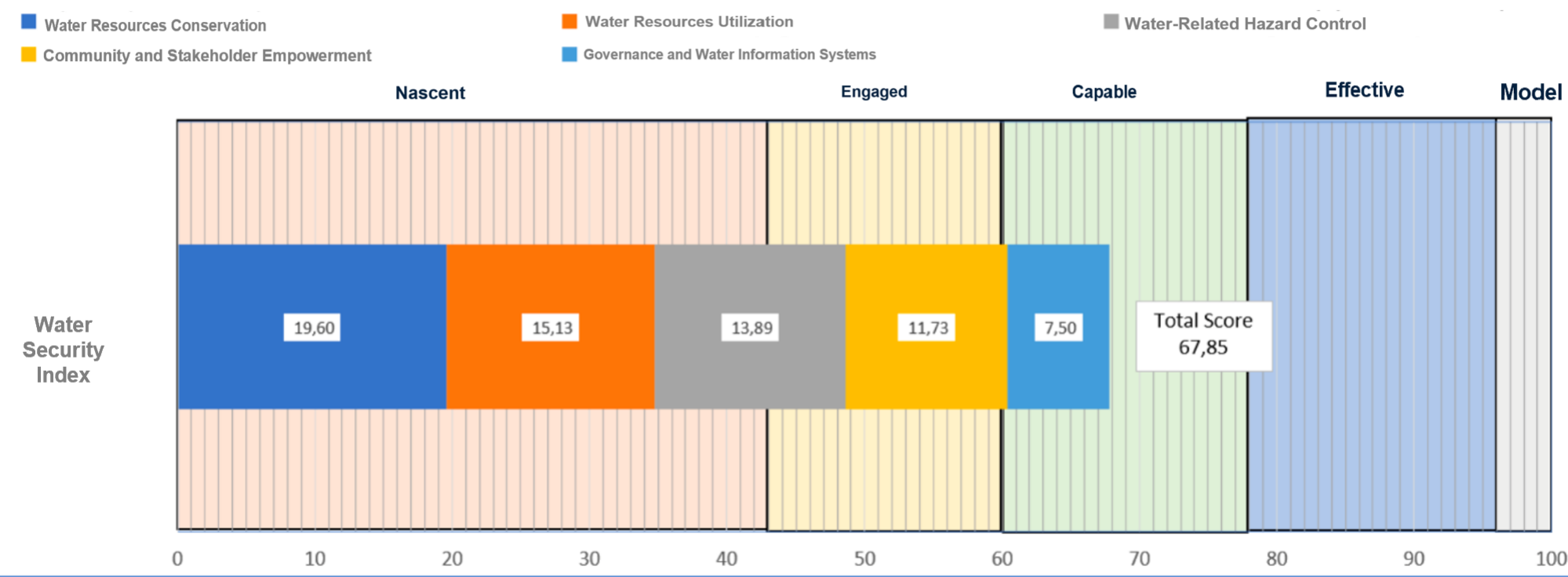
The dimensions for calculating the Water Security Index refer to the 5 (five) Pillars of Water Resources Management

National Water Security Index of each dimension



National Water Security Index: 3.48
(Capable)

National Water Security Index



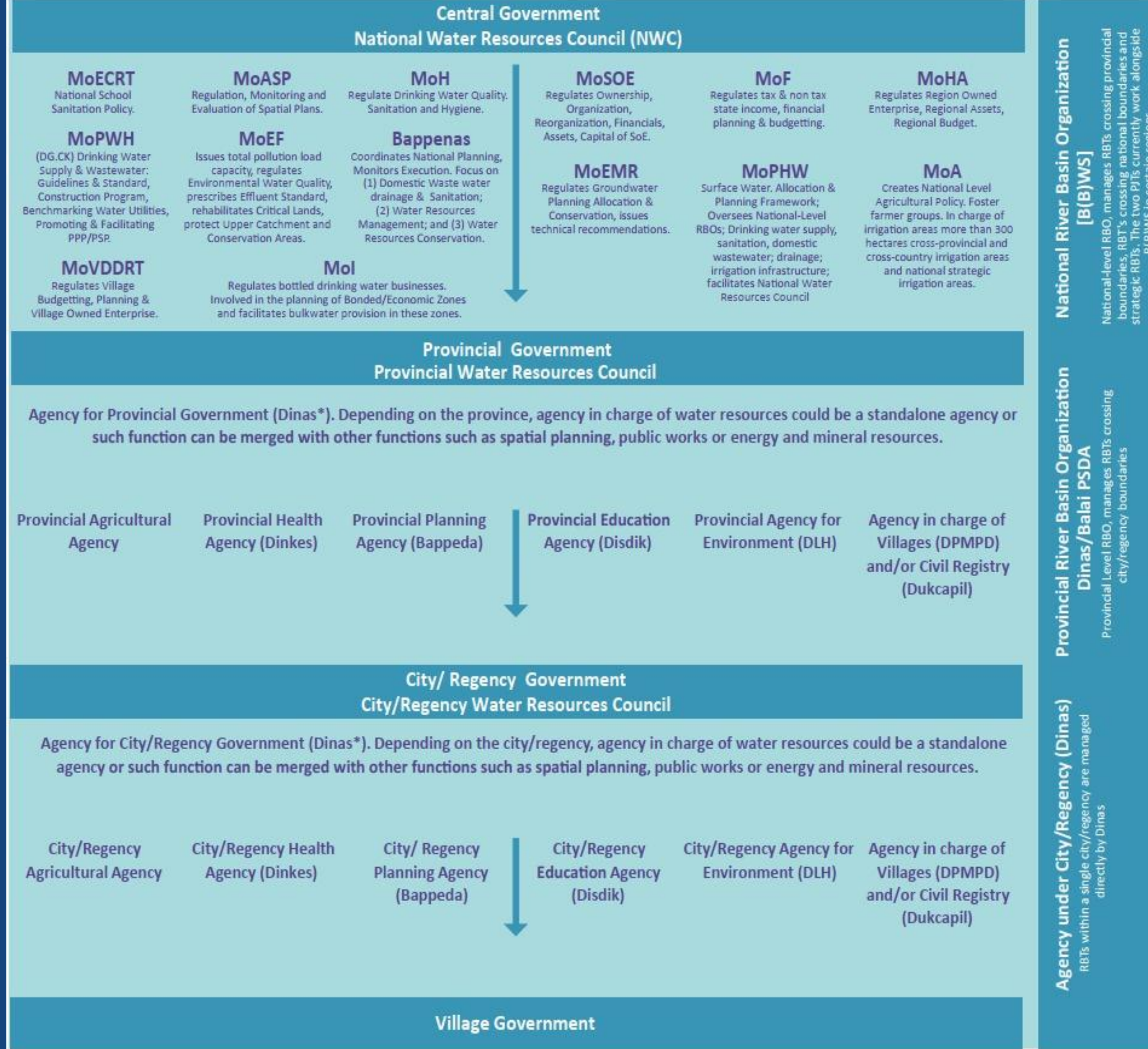
Water Security Index	Score		Range Index		Stage
5	96	$\leq x \leq x$	4,8	$\leq x \leq x$	Model
4	78	$\leq x < 96$	3,9	$\leq x < 4,8$	Effective
3	60	$\leq x < 78$	3	$\leq x < 3,9$	Capable
2	42	$\leq x < 60$	2,1	$\leq x < 3$	Engaged
1	0	$\leq x < 42$	0	$\leq x < 2,1$	Nascent

IWRM Implementation in Indonesia across Sectors, Ministries, and Institutions

Building on the key challenges identified, these pathways outline Indonesia's water resilience agenda for 2025–2029

Strengthening IWRM Implementation

Enhance cross-sectoral and inter-regional coordination through robust River Basin Organizations (RBOs).



Conclusion:

Key Takeaways on Indonesia's Integrated Water Resources Management (IWRM)

- 1.Systemic Challenges:** Indonesia faces complex water security challenges, including uneven water distribution, flooding, drought, pollution, and land subsidence, exacerbated by climate change and rapid land-use changes.
- 2.IWRM as the Core Solution:** The national response is anchored in **Integrated Water Resources Management (IWRM)**, mandated by Law No. 17/2019. This holistic framework integrates five pillars: **Conservation, Utilization, Hazard Control, Community Empowerment, and Governance.**
- 3.Critical Integration of Sectors:** A vital success factor is the **integration of spatial planning (RTRW) with water resources management.** Land use decisions directly impact water health, and water data must inform zoning to protect critical areas.
- 4.Adaptive and Forward-Looking Planning:** Future water security depends on **adaptive river basin management** that incorporates climate change projections and land-use scenarios into 20-year strategic plans (*Pola SDA*) to assess risks and ensure resilience.
- 5.Global and Local Collaboration:** Indonesia is strengthening its approach through **international collaboration**, exemplified by the **Center of Excellence for Water and Climate Resilience**, and by implementing practical IWRM pilot projects, especially in vulnerable small islands.

Indonesia's strategy involves a **coordinated, multi-sectoral, and data-driven approach** to move from policy to practice, aiming to achieve a capable and effective water security status for a sustainable future.



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Thank You

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