

Getting to the Crux(es) of the Matter(s)

Water quality and problem-setting in the Brantas River basin

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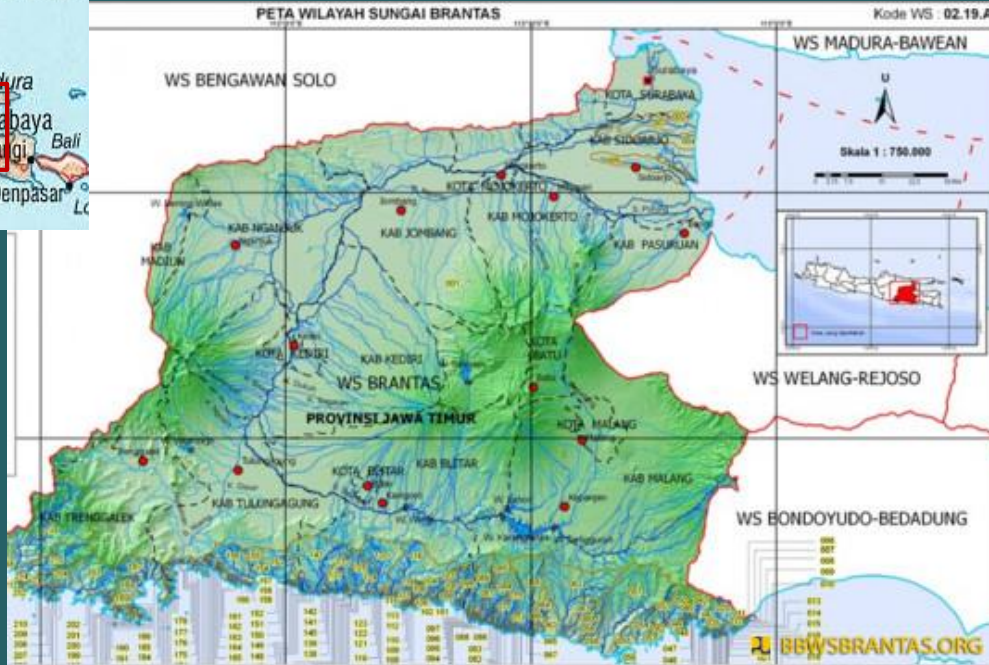
*EGU 2022: Role of hydrology in policy, society and interdisciplinary
collaborations: Across disciplines and beyond scientists*





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Brantas River Basin



Length: 320 km
Area: ~12,000 km²
Pop: 15-18 million

Tropical monsoon climate

Water potential:
12 billion m³/yr

Tap water supply for 40% of
East Java population

Irrigation for 25% of
Indonesia's rice crop

Map source: https://bbwsbrantas.org/westpark/under/bone/p/1908141545_fed66ce183653df3ba5434c2709be87e_m.jpg



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Fostering inclusive growth, health and equity by mainstreaming water quality in River Basin Management in the Brantas River Basin, Indonesia

5-year consortium project (2019-2024)

Funding: Netherlands Enterprise Agency



Water quality monitoring

Improved sampling,
analysis, and data
management

Clean Industry Hub

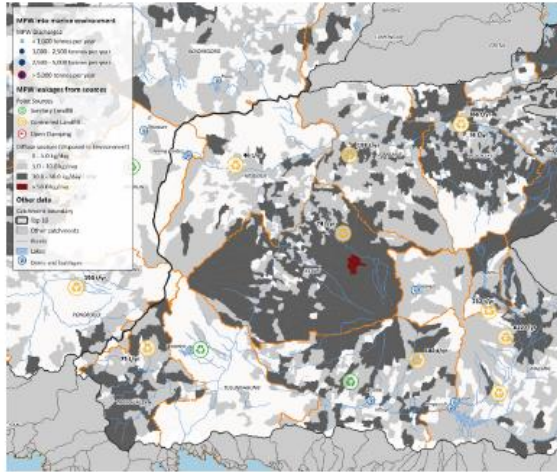
Efficient wastewater
management
Support for regulatory
compliance

Institutional strengthening & community participation

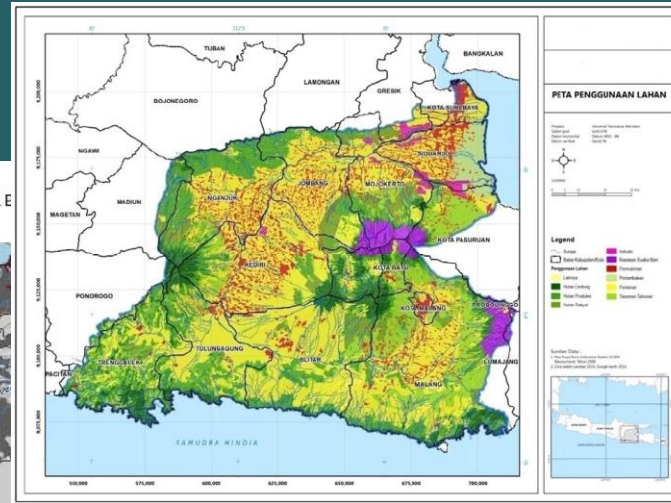
IWQ Management Plan based
on joint problem analysis
Guidelines for inclusive community
engagement

Mapping pollution sources for problem analysis

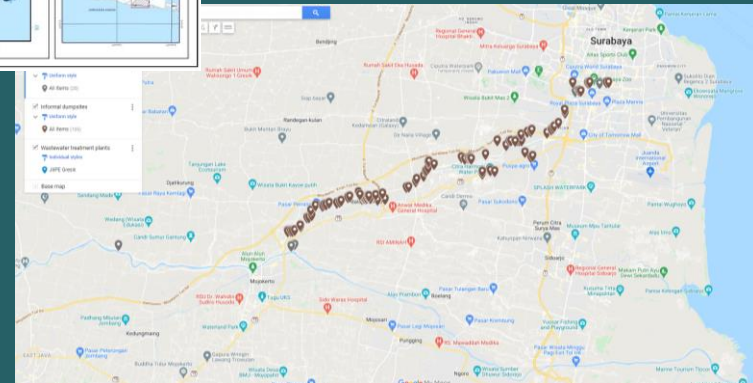
FIGURE 33.
MPW disposed of in the terrestrial environment through illegal dumping/fly-tipping in E
catchment



Source: World Bank 2021. *Plastic Waste Discharges from Rivers and Coastlines in Indonesia*. Marine Plastics Series, East Asia and Pacific Region. Washington DC.



Source: Wilayah Sungai Brantas
Pola, 2020



Source: Ecoton Aksi Brantas project data (2021)

Mapping the policy terrain for problem analysis



**Consider
implementation**

boundaries and opportunities in
design, appraisal, and
prioritization / selection of projects

Empathize with

**stakeholder
interests and
objectives**

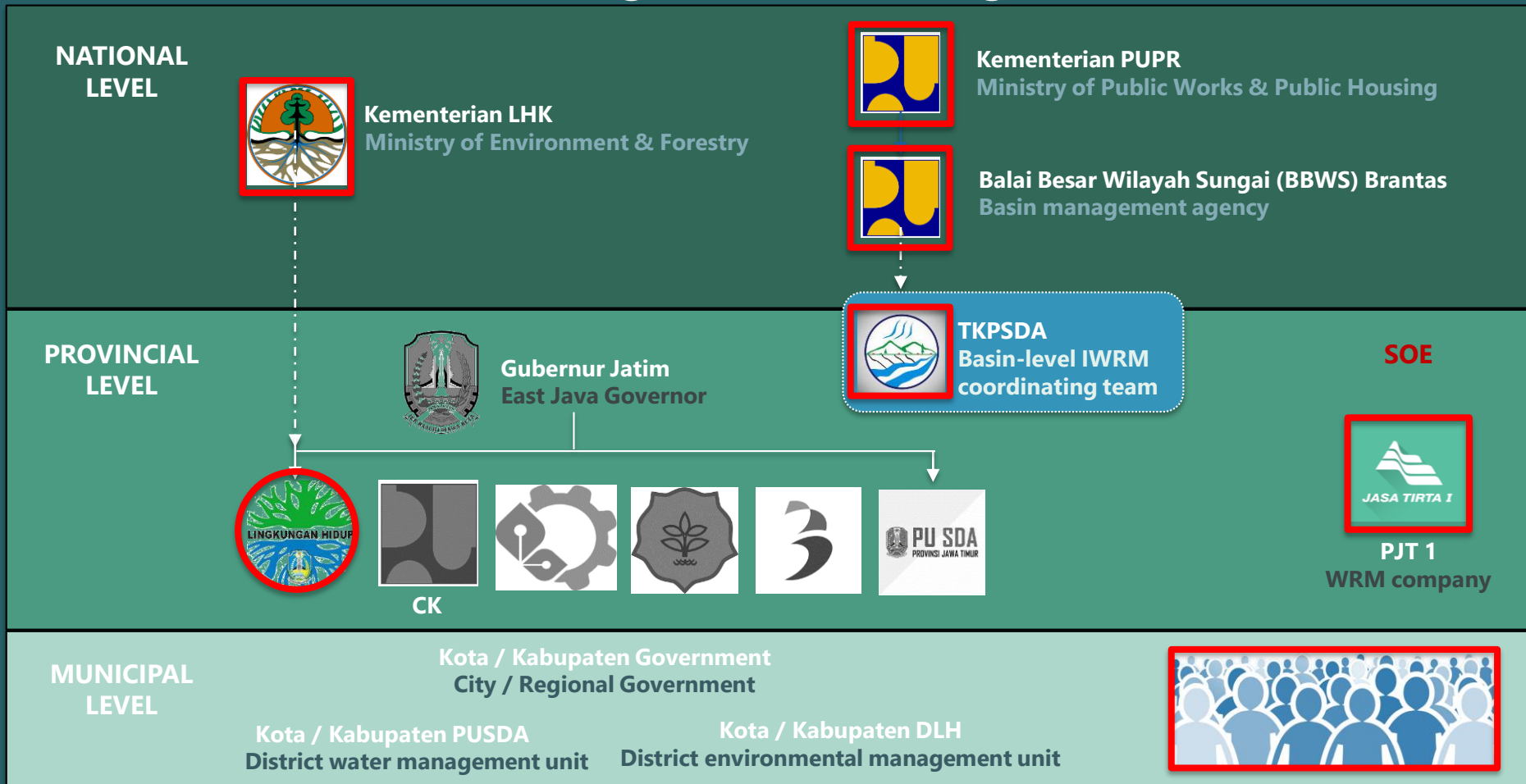
in the networked
governance
arrangement

Create opportunities to **integrate
“hard-won”
knowledge**

Policy literature: Problem- and solution-finding

- **Implementation** should be at the center of formulation
- **Satisficing** and “next-best” solutions
 - Best technical solutions aren’t necessarily best policy choices
- Approach to **prioritization** is often unclear
 - How do/should we make the “hard choices”?
- **Science political**

Brantas River water resource governance arrangement



Doctrinal legal research

- Recorded and analyzed 178 WQM tasks and functions ("tupoksis") from 24 source laws
 - Administrative law
 - Water law

The image shows three overlapping Indonesian legal documents. The top document is Peraturan Pemerintah (Government Regulation) No. 22 Tahun 2021, signed by President Joko Widodo, regarding the management of water resources. The middle document is Peraturan Gubernur (Gubernur Regulation) Jawa Timur No. 10 Tahun 2018, signed by Governor Erwin Supriatno, regarding the management of water resources in East Java. The bottom document is Peraturan Gubernur (Gubernur Regulation) Jawa Timur No. 11 Tahun 2020, signed by Governor Erwin Supriatno, regarding the management of water resources in East Java.

Overlapping mandates?
Missing mandates?
Clear roles and responsibilities?
Opportunities for coordination / collaboration?

Results: Doctrinal tupoksi review



Urban drainage

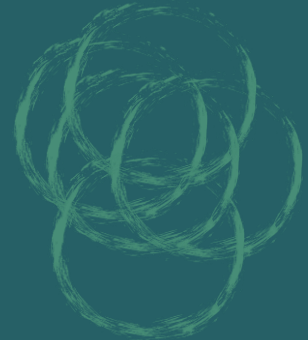
Sanitation development
/ provision

Wastewater permitting



Planning &
evaluation for WQ

Community
engagement



WQ monitoring &
data management

Enforcement &
compliance

Water managers survey

Legal framework

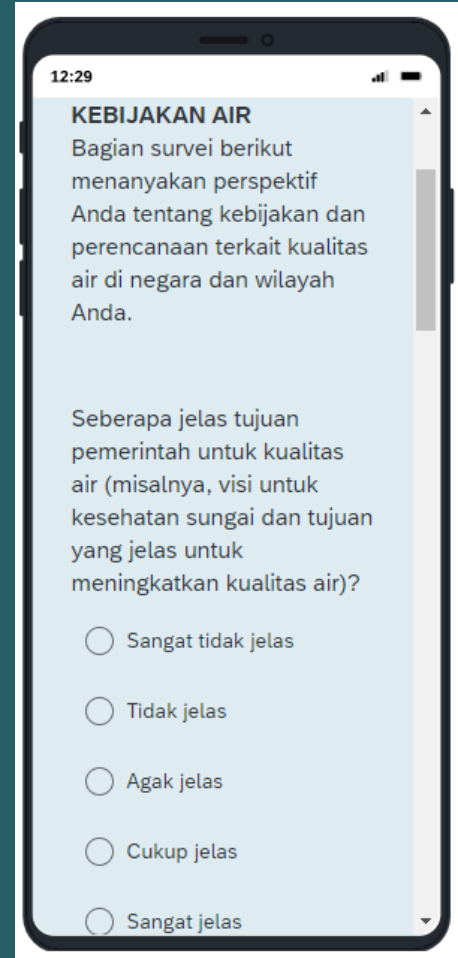
Clarity of roles and responsibilities
Rights in WQM

Water quality policy

Policy formulation
Planning and sector coordination
Monitoring, evaluation, and adaptive governance
Stakeholder engagement

Administration

Implementation effectiveness
Quality of enforcement
Coordination mechanisms
Resources and capacity
Data and information



12:29

KEBIJAKAN AIR

Bagian survei berikut menanyakan perspektif Anda tentang kebijakan dan perencanaan terkait kualitas air di negara dan wilayah Anda.

Seberapa jelas tujuan pemerintah untuk kualitas air (misalnya, visi untuk kesehatan sungai dan tujuan yang jelas untuk meningkatkan kualitas air)?

☐ Sangat tidak jelas

☐ Tidak jelas

☐ Agak jelas

☐ Cukup jelas

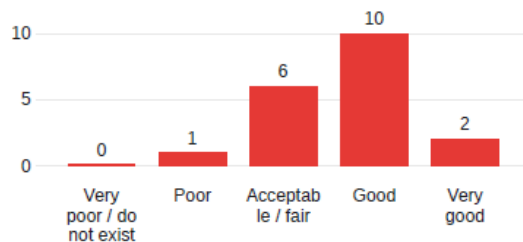
☐ Sangat jelas

Preliminary results: Water managers survey

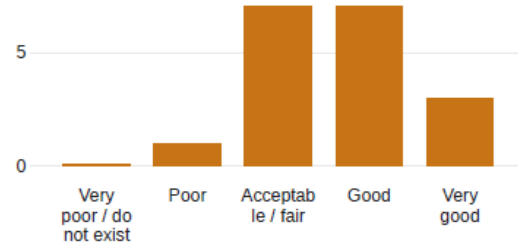
Legal framework

How clear are the following **laws** for water quality management?

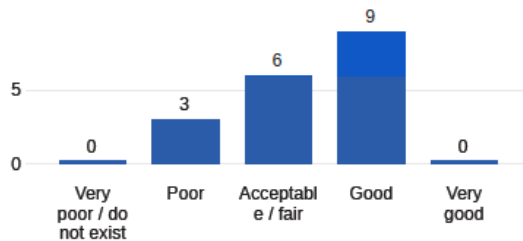
Laws regarding agencies' roles and responsibilities for managing water quality



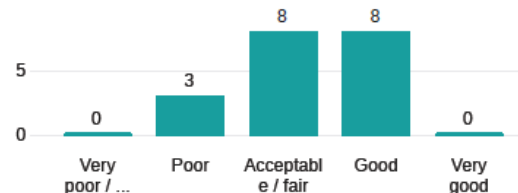
Laws on wastewater management (e.g., wastewater discharge guidelines)



Laws on solid waste disposal (e.g., guidelines on means of and locations for waste disposal)



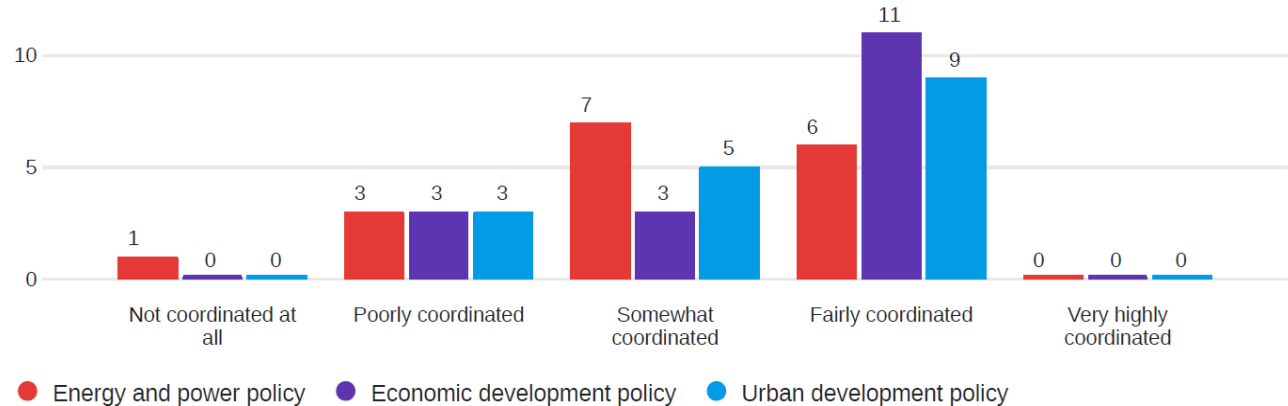
Laws on managing land use to safeguard water resources (e.g., guidelines regarding soil management, amount of forested land in watershed)



Preliminary results: Water managers survey

Water quality policy

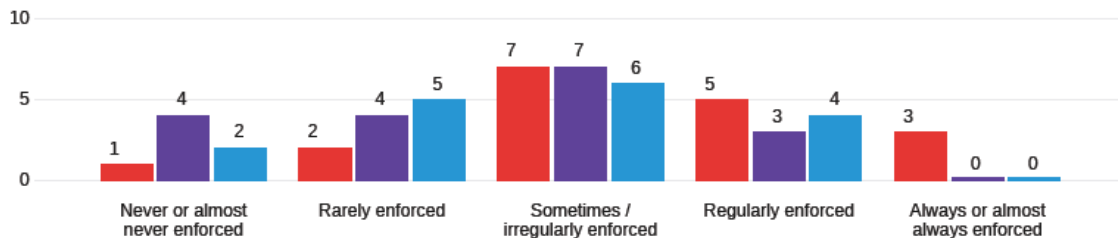
To what extent are water resource management **plans coordinated** with the following policies and strategies?



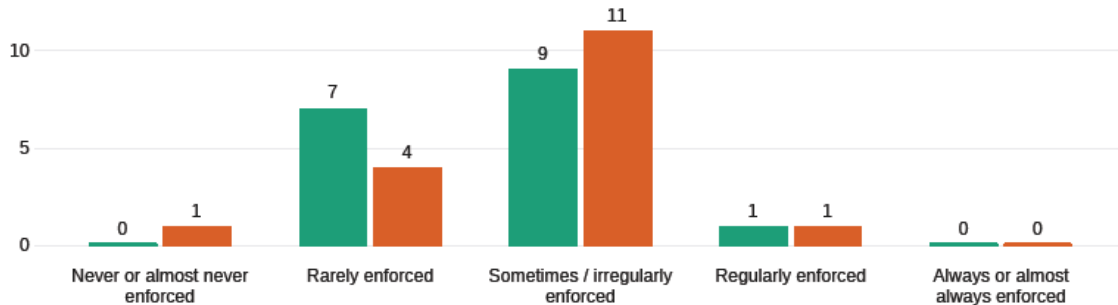
Preliminary results: Water managers survey

Administration

How would you characterize the **enforcement** of the following types of regulations / laws?



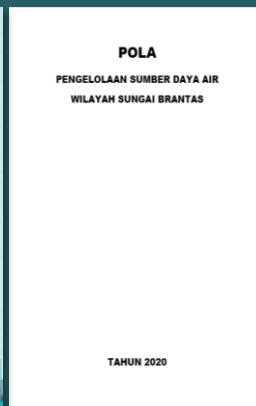
● Rules for industrial wastewater handling and water pollution ● Rules for domestic wastewater disposal
● Rules for solid waste disposal



● Rules for managing land use to safeguard water ● Rules for riparian development and construction

Strategy review

		PUPR Renstra	KLHK Renstra	BBWS Pola	RPJMD	DLH Renstra
WQ Monitoring & Info System Management	Extend water quality monitoring network, including online continuous monitoring.					
	Develop integrated Inter-Agency Info Management System for hydrological data.					
	Improve the availability and quality of water resource and water quality data.					
	Compilation of a National Water Security Index					
Solid Waste Management	Regularly publish water quality data (monthly)					
	Improve solid waste management, including collection, processing, 3R, and storage.					
	Increase community welfare by increasing the economic value of waste.					
	Reduce garbage production and increase use of waste banks.					
Wastewater Treatment & Sanitation	Improve / expand sanitation facilities and infrastructure.					
	Develop wastewater treatment facilities for industry, livestock / agriculture, and domestic					
	Separate network for collecting household wastewater from rainwater drainage					
	Strengthen compliance monitoring and enforcement of law and regulations					
Pollution Enforcement / Control	Harmonize law enforcement.					
	Support compliance with industrial wastewater standards / develop clean industry.					
	Increase business awareness regarding pollution control and prevention tools					
	Strengthen environmental assessment, permitting, identification of pollution sources.					
Conservation	Extend PROKASHI implementation across Basin.					
	Improve conservation management incl. biodiversity and ecosystem services.					
	Increase public understanding of water quality issues and environmental management.					
	Extend community involvement in water resource management					
Community Empowerment	Increase community involvement in water quality monitoring.					
	Strengthen community and private sector involvement in solid waste management.					
	Increase number of environmental awards.					
	Strengthen TKPSDA's activities related to monitoring and evaluating WRM.					
Planning / Formulation / M&E	Improve IWRM via planning tools					
	Clarify border areas of water resources, including rivers, lakes, and reservoirs.					
	Strengthen operational strategies for disaster resilience and disaster preparedness.					
	Strengthen water management institutions and clarify functions					
Administration / Organization	Improve use of technology for IWRM and environmental management.					
	Development of derivative laws to support UU 17 of 2019.					
	Increase number of institutions concerned / attending to water management.					
	Mainstream gender consideration in management, planning, and evaluation.					
Gender	Increase participation of women in decision-making.					



Results: Building blocks for Brantas IWQMan

Strengthen water quality monitoring

- Extend water quality network / improve efficiency of sampling.
- Increase availability of real-time data.
- Regularly report data.
- Inventory pollution sources (e.g., discharge points) in river basin.
- Develop capacity for real-time detection and response to pollution incidents (early warning).

Integrate WQ and hydrological data management systems

- Develop standardized reporting formats for WQ data.
- Create a centralized web-based database with online WQ data submission.
- Support TMDL calculation based on input data.
- Integrate WQ data with other hydrological data in an inter-agency management system.

Support industrial discharge compliance

- Grow number of industries meeting PROPER standards.
- Strengthen incentive programs (e.g., awards).
- Innovative financing (PPP, environmental funds, resource reuse) for WQM.
- Strengthen guidance / support to companies for regulatory compliance and licensing.

Expand wastewater treatment coverage and cost-efficiency

- Increase availability of information and guidance / training on wastewater technologies.
- Identify priority siting, costs, scale, etc. for centralized IPAL for industry.
- Pilot and scale-up low-cost, small-scale IPAL.

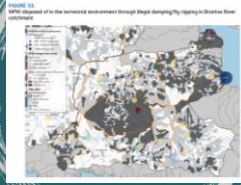
Strengthen coordination, planning, and evaluation

- Strengthen application of WQ data for decision support and enforcement.
- Strengthen coordination in WQ planning formulation (Pola - spatial plan – KLHK plan)
- Strengthen monitoring and evaluation (M&E) framework to support coordinated implementation and gender equity goals.
- Coordinate enforcement of discharge standards / clarify response protocols across agencies.
- Strengthen early warning mechanisms / processes.
- Clarify tupoksis for solid waste removal in river resources.
- Recommend locations for improved landfills

Engage communities in IWQM

- Involve communities in water quality monitoring.
- Strengthen community-based solid waste management (e.g., pilot projects).
- Increase awareness of environmental water issues / water stewardship.
- Strengthen role of women and community in water planning and decision-making processes (e.g., community budgeting and planning).

Inputs for participatory problem analysis



What did we gain from policy terrain mapping?

- **Criteria** for problem selection and project design and appraisal
- **Scope / boundaries** of the policy problem / goals
- More realistic view of implementation **feasibility** for technical interventions
- Clarity in nomination of **implementing agencies** in IWQMan plan formulation
- Identification of institutional, informational, and capacity challenges for **soft infrastructure** interventions



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