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Involving communities in Indonesia

Promoting Community Participation in Integrated Water Resources Management (IWRM)

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Acronyms and Abbreviations

APBD	Regional Revenue and Expenditure Budget
BAPPENAS	National Development and Planning Agency
BBWS	River Basin Territories Organisation
BKPP	Government Staff Training and Education Agency
BLH	Environmental Protection Agency
BMKG	Meteorological, Climatological, and Geophysic Agency
BNPB	National Board for Disaster Management
BP-DAS	Watershed Management Agency
BPN	National Land Agency
Dirjen SDA	Water Resources General Directorate
Ecoton	Ecological Observation and Wetland Conservation
FSA	Fish Sanctuary Area
KLHK	Forestry and Environmental Ministry
KPC	Ciliwung Community
LRBC	Lamasi River Basin Council
MDG	Millennium Development Goal
MK	Constitutional Court
MUSRENBANG	Development Planning Conference
Perda	Local Regulation
PDAM	Government-owned Drinking Water Company
PERHUTANI	State Forestry Company
PJT	JasaTirta Public Company
PLN	State Electricity Company
PLTA	Hydroelectric Power Plant
POKMASWAS	Community Monitoring Group
PP	Government Regulation
PSDA	Water Resources Management
PTPN	State Plantation Company
PUPERA	Ministry of Public Work and Housing
RBT	River Basin Territories
TKPSDA	Water Resources Management Coordination Team
UNESCO	United Nation Education, Science and Cultural Organization
WS	River Basin
YMI	Community Partnership Foundation

School children test the water quality by analysing bio-organism samples in Brantas River, East Java

PREFACE

Experiences in countries around the world show that people in urban and rural communities and villages are very willing and able to manage or co-manage the water resources they depend on. All they need is the capacity to pursue their basic rights and an understanding of the legal and institutional spaces for community participation as well as the competing demands for water that affect the local ecosystem.

Civil society organisations from Asia, Latin America and Africa increasingly share the conviction that successful and effective water resources management is only possible if communities have the capacity and opportunity to develop and negotiate their own visions and solutions to challenges related to water resources management. Since the late 1990s, CSOs have identified the Negotiated Approach (NA) as a valuable way to encourage and support communities to become involved in all aspects of managing water resources in a meaningful way and on a long-term basis – in short, to promote truly participatory Integrated Water Resources Management (IWRM).

In 2006, Indonesian CSOs identified the Negotiated Approach as an effective approach to improve community participation in the implementation of Water Law No.7/2004. As part of two pilots in Bengkulu basin on Sumatra and Lamasi basin on Sulawesi, the Livelihood Analysis and Activity Analysis Guide Series were developed. These Guidelines help communities and civil society organisations gain insight in the economic activities and the variety of stakeholders in their basin. It also helps them to place the problems of local communities in a broader geo-political and geo-economic context.

Thanks to the pilots, the local CSO Yayasan Ulayat Bengkulu is now a member of the Provincial Water Council (PWC) where it voices community concerns and needs. This led to a negative advice, and eventually to the rejection, by the PWC of an exploitation license for mining by the local regency. In 2014, a memorandum of understanding was signed between Rindu Hati village and FH University. The cooperation aims at providing a legal basis for advocacy on mining licenses. In Lamasi basin, CSOs assisted the Head of Luwu District in the formation of the river basin council 'Komite Das Lamasi'. The statutes explicitly incorporate structural spaces for local communities to participate in formal planning processes.

Partly inspired by these experiences and successes, and partly out of frustration with the accelerating water pollution and floods that are caused by uncontrolled industrial pollution, illegal mining and lack of waste management, CSOs on Java and Sumatra started to facilitate negotiation platforms for community-based river basin management.

In December 2014, the CSOs Both ENDS (Netherlands), Ecoton (East Java), Komunitas Peduli Ciliwung (West Java) and Yayasan Mitra Insani (Riau) decided to join forces and initiate IndoWater CoP.

With this Community of Practice, we aspire to contribute tangible models for community participation in IWRM, while strongly addressing the often destructive impacts of failing river basin management in national policymaking.

Riska Darmayanti
IndoWater CoP coordinator

Daniëlle Hirsch
Director Both ENDS

1 INTRODUCTION

Population growth and corresponding economic developments lead to a skyrocketing demand for water worldwide. The quantity of useable water continues to reduce due to increased water usage for industrial, agricultural and daily household activities, increased degradation of natural resources and pollution of surface and groundwater. Indonesia is no exception to this problem. Back in the seventies of the previous century, reduced access to water started to receive worldwide attention[1]. A wide range of recommendations was formulated during international conferences and by international bodies such as UNESCO, creating what has been termed 'Integrated Water Resources Management' (IWRM). However, since the organisation of managing a public resource such as water is by definition anchored in a country's unique national system of public representation and administration, the implementation of these recommendations typically remains the responsibility of individual countries.

Indonesia is blessed with abundant water resources: by international comparison the country ranks 5th in terms of total available water resources[2]. At the same time, however, Indonesia faces many water problems such as water pollution, overextraction of groundwater, floods and droughts. Even though the government of Indonesia stated 'the actualisation of stable utilisation in efficient, effective, and sustainable manners for the prosperity of the whole people' in its *Indonesia Water Vision* (2000), it has to be concluded that implementation of IWRM in Indonesia has failed. The state of the Water Resources System is deteriorating and this affects the well-being of the people as well as the efficiency of economic activities.

NGOs believe they have a unique position in between civil society organisations and the government administration, because they have strong networks and the capacity to mobilise public opinion. Wanting to contribute to an improvement of IWRM and the water resources system in Indonesia, in order to improve people's access to clean water, a group of NGOs joined forces and experiences through the Indonesia Water Community of Practice (IndoWater CoP).

This booklet introduces IndoWater CoP. It first describes Indonesia's water resources and its management (Chapter 2) and the country's experience with IWRM (Chapter 3). Subsequently it introduces the Negotiated Approach as the way towards water resources management processes in which local communities have a fair and equal position vis-à-vis other, often more powerful players. It also presents experiences and models for Negotiated Approach implementation in Indonesia (Chapter 4). Finally, Chapter 5 introduces IndoWater Cop: its raison d'etre, vision, roles and focus for the near future. The booklet is meant for government institutions, civil society organisations, and all other stakeholders interested in cooperating with IndoWater CoP.

Traditional fisherman with two Asian Red tailed Catfish in Brantas River, East Java. This fish population is decreasing due to habitat destruction, poor water quality and destructive fishing

2 WATER RESOURCES AND THEIR MANAGEMENT IN INDONESIA

2.1

AVAILABLE WATER RESOURCES

The total water potential of Indonesia is estimated at 3,221 billion m^3/year. In the year 2011 this coincided with 16.8 m^3/capita/year for Indonesia as a whole, varying between 98,800 and 5,500 m^3/capita/year for Kalimantan and West Nusa Tenggara and East Nusa Tenggara Islands respectively[2].

All common water sources (rainwater, surface water and groundwater) are abundant in Indonesia. The country has a diverse rainfall distribution from 800 up to 4,000 mm/year, with a long-term national average of about 2,700 mm/year. Most areas have rainfall throughout the year, though concentrated in a period of about 5 months. Surface water is scattered in river bodies (5,886 units), in natural and artificial lakes, and in swamps and wetlands (estimated at 330,000 – 400,000 km^2)[3].

Indonesia ranks in the world's top 10 countries for groundwater extraction with 14 km^3/year[4]. For the whole country, 421 groundwater basins were identified. The Geographycal Agency roughly estimated in 2008 that potential extraction rates vary between 496,217 x 10^6 m^3/year (unconfined aquifers) and 20,906 x 10^6 m^3/year (confined aquifers)[5].

Despite the abundant water resources, in many situations and places, access to water is limited due to pollution (see 2.6.5).

2.2

WATER RESOURCES INFRASTRUCTURE

2.2.1 Irrigation areas

In 2010, the total irrigated areas in Indonesia amounted to 7,469,796 ha (33,210 systems), consisting of 2,851,006 ha (241 systems) under central government authority, 1,423,222 ha (1,109 systems) under provincial government authority, and 3,195,568 ha (31,860 systems) under district government authority[6]. 40% of the irrigated area in Indonesia is located on Java (inhabited by nearly 60% of the total population[7]). The productivity in these areas is between 1,2 – 2 times higher than the productivity outside Java.

2.2.2 Piped water supply systems

Piped water supply systems are mainly managed by 341 government-owned drinking water companies (PDAMs). These PDAMs have been under the jurisdiction and ownership of subnational governments since 1999, when legislation was enacted that transferred the responsibility for water and sanitation infrastructure to subnational governments. The majority of the PDAMs are now struggling with deteriorating water quality, while systems operate on an intermittent basis with inadequate pressure levels. Service levels in urban areas declined from 39% of the population covered in 2000 to 31% in 2010[8]. According to data from the National Planning Agency (Bappenas) in 2006, 31% of households in urban areas had access to a piped water supply, 9% in rural areas and an average of 18% across the country[9]. This poor situation resulted in many public protests, such as in Nagari Kepala Hilalang (West Sumatra) where customers destroyed pipes to denounce the fact that almost 50% of the PDAM's customers did not get clean water.

Lack of funding for investments and maintenance are important causes of the decline of quality of piped water. Based on a government statement, to meet the MDGs target by 2015, Indonesia would need to invest Rp 43 trillion in clear water funding. In 2008, the government only provided Rp 500 billion[10]. The usage of (increasingly contaminated) river water as clean water supply without adequate treatment technology, is another reason for the shrinking availability of clean, piped water.

The World Bank asserts that local governments, between 2001 and 2008, typically invested only 2% of their budgets in infrastructure for piped water supply.

2.2.3 Dams and river regulation works

The primary responsibility for the management of rivers and dams lies with the Public Works and Housing Ministry (PUPERA) and the Forestry and the Environmental Ministry (KLHK). There are approximately 29 regulations on river and dam management. PUPERA and KLHK differ in their approach to river management. PUPERA has a more technical approach while KLHK takes the ecosystem as the point of departure. Both ministries draw up management plans and have multi-stakeholder coordination bodies for integrating these plans with the actions and responsibilities of the different members. Moreover, KLHK works at watershed level, while PUPERA works at the level of the

Wilaya Sungai (WS) or river basin territories (RBTs) (see 2.4 for an explanation of Wilaya Sungai).

2.2.4 Hydropower

Indonesia has a hydropower potential of approximately 75,670 Mega Watt (MW); in 2010, over 100 hydro sources of varying sizes were identified. Around 45 sites located in sparsely populated areas in West Sumatra have a combined catchment area of 37,121.5 km^2 and energy potential of 383,83 Mega Watt (MW). Although the country has an estimated high potential for hydro power, only 5% is being used (5,705 MW). The identified potential hydropower sites in Indonesia will be developed by the government and private sector, of which 60% will be developed by state-owned electrical companies.

Table 1 • Overview of the hydropower potential in Indonesia per region[11]

REGION	POTENTIAL (MW)	INSTALLED CAPACITY (MW)
Java – Bali	4,581	2,536
Sumatra	15,814	868
Borneo	21,611	30
Sulawesi	10,203	210
Others	23,475	5
Total	75,670	3,649

2.3

THE USE OF WATER

In 2000, the total water withdrawal was 113 km^3. Agriculture accounted for 82% of this withdrawal, municipalities for 12% and industries for 6%. Surface water and groundwater withdrawal was 84% and 16% respectively of the total water withdrawal.

2.3.1 Irrigation

Irrigation used in agriculture is the primary cause by far of water withdrawal. According to Indonesia's Ministry of Public Works, in 2012 approximately 84% of the total rice paddies in Indonesia were irrigated (16% rain fed)[12]. Water for irrigation is directly taken from rivers or comes from reservoirs: 6,432,212 ha (89%) depending on river run-off and 797,971 ha (11%) from reservoirs.

In 2013, 39.96 million people were working in the agriculture, plantation, forestry, and fishery sectors. Limited access to or changing availability of reliable water resources make many of these people and their livelihoods vulnerable[13].

NOTES

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2.3.2 Households

Groundwater is used by 74% of households for their clean water sources, while the rest use river water (3.4%), piped surface water (21.2%), and other water sources (1.4%). Groundwater is taken from protected dug wells, tubewells or protected springs[14]. Most of the households, however, boil their water to make sure it is safe for drinking. Nowadays, groundwater quality is deteriorating while springs are becoming rarer and more difficult to find. For example, in the upstream region of the Brantas River, the number of recorded springs went down by 28% between 2007 (170) and 2009 (122).

Due to the deteriorating quality of surface and groundwater and the low access to piped water supply (see 2.2.2), access to safe water in Indonesia is very limited and people rely massively on bottled water.

2.3.3 Industries and other non-domestic use

In the year 2000 the industrial water demand was 7% of the total water demand. It is predicted that in the year 2032, this demand will have increased to 17%.[15] As piped and open surface water are relatively limited by its quantity and quality constraints, industries often rely on groundwater to fulfill their needs. This is the case in particular in large cities on Java.

The limited availability of water resources for industrial activities has become a determining factor in planning for industrial development. Since 2012, the government established the precedent that only industries with high technological capabilities that require low water consumption are allowed to operate in the water scarce regions of Karawang and Bekasi. Other industries that require large amounts of water are phased into moving to Majalengka (West Java) and Boyolali (Middle Java)[16].

2.3.4 Hydropower

The Indonesian government has set specific goals for hydropower to be met in 2015, with 1,300 Mega Watt (MW) new hydropower. According to its hydroelectric power development plan 2011-2020, the state electricity company (PLN) aims for an increase in hydropower production of 11%[9]. Hydropower efficiency in power plants (PLTAs) is often affected by low water supply and increased sedimentation in the water reservoirs caused by watershed degradation. In August 2014, the low water discharge in Kotopanjang (Riau Province) PLTA reservoir meant that only one out of the three available turbines could move, producing 17% of total electricity produced under normal conditions. JasaTirta (PJT) had to ration irrigation from Sutami and Wonogiri reservoirs to sustain hydro electricity production in both reservoirs[17].

2.4

INSTITUTIONAL ARRANGEMENTS

At the national level, the main players in water management are the ministries of Public Works (PU), Mining and Energy (ME), and Environment and Forest (EF). The allocation and management of Indonesia's surface- and groundwater resources are jointly overseen by the designated departments of PU and ME, while the ministries of PU and EF share tasks and responsibilities with regard to river basin management. PU should be considered the main agency for water resources management. It has a powerful decentralised structure, even though final decision making is done in Jakarta. PU has been responsible for the implementation of the Water Law No. 7/2004.

At regional level, similar structures exist but their functioning is hampered by a lack of access to funds and the presence of decentralised departments of national agencies, mainly PU and EF.

Indonesia is divided into 131 River Basin Territories (RBTs): 5 transboundary, 29 transprovincial, 33 national strategic,[18] 51 transdistrict/ transmunicipal, and 13 within the boundaries of individual regencies/ municipalities. This division and classification follows the Water Law No.7/2004, the regulation from Minister of Public Works, No. 11/ PRT/M/2006, and Presidential Decree No. 12/2012.

In addition, multi-stakeholder TKPSDAs (Water Resources Management Coordination Team) have been installed. These are coordinating councils at river basin territory level,[2] which advice the Ministry of PU on planning, monitoring and evaluation.

Reference should also be made to national and provincial water councils for policy and strategy formulation, which were also created after the enactment of Water Law No. 7/2004.

In 2015, this entire organisation is 'on hold' as the new water law has been revoked by the constitutional court (MK), upon request of several civil society organisations.

It is important to note that RBTs (River Basin Territory; called wilayahsungai (WS) in Bahasa) often encompass more than one individual river basin and that they are managed by the PU departments BBWS or BWS, which heavily depend on Jakarta. This implies that RBTs, which confusingly are also called River Basin Organisations (RBO), are NOT the same RBOs that are referred to in the discourse about the need for management on river basin level. The latter RBOs relate to one individual basin in which stakeholders share the same water resource, which would enable participatory IWRM.

NOTES

This upstream spring at Bendosari village is polluted with pesticides (Malang regency)

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Table 2 • The difference between BBWS/BWS and TKPSDA

FEATURE	BBWS/BWS	TKPSDA
Responsible to	• Water Resources General Directorate (Dirjen SDA) of Public Works and Housing Ministry (PUPERA)	• Minister of PUPERA for transboundary province, governor for transboundary regency/municipalities, regent for regency
Task	• Conservation, development, and utilisation of water resources • Controlling water destruction force in river basin territories	• Discussing POLA and water resources management planning, water allocation, water resources related information management system • Giving advice related to water resources management
Function	• Planning and implementation of spring conservation area • Water resources management • Providing technical recommendations for water resources utilisation permission • Operation and maintenance of water resources • Hydrological system management • Providing data and information related to water resources	• Include expertise and data on integrating water resources management • Coordinating and integrating multi-stakeholder interest • Monitoring and evaluating the water resources management implementation in their river basin

Table 3 • Institutions involved in the platform initiatives in Surabaya River, Ciliwung watershed and Kampar basin (see chapter 6)

INSTITUTION	ROLE AND RESPONSIBILITY
national	
Environmental and Forestry Ministry	• Formulating, establishing, coordinating and implementing policy in forestry and environmental management • Implementing technical guidance and supervising forestry and environmental management • Researching, developing, and innovating in environmental and forestry sector
Hydroelectric Power Plant Company (PLN)	• Generating electricity from hydropower plant
Provincial/Regency	
River Basin Territories Organisation (BBWS)	• Arranging water resources management plan and pattern • Arranging plan and implementation of water resources protection area • Providing technical recommendations in giving permission for utilisation of water resources on river area • Operation and maintenance of water resources in river area • Management of hydrological system • Providing water data and information • Facilitating TKPSDA activities in the river area • Community development in water resources management
River Basin Management Bureau (BPDAS)	• Developing a watershed institution, system, and partnership model • Monitoring and evaluating watershed management • Providing data and information of watershed management
Regional Development Plan Agency (Bappeda)	• Setting up, issuinge permission, and controlling provincial development site plan
Environmental Protection Agency (BLH)	• Monitoring and controlling industrial obedience in waste water discharging permission and waste management • Monitoring water quality and arranging policy in controlling water pollution • Developing conservation management • Giving environmental management recommendations and allocating business permits
Public Work Agency (Dinas PU)	• Providing hydrological data of water resources • Managing water resources with regard to utilisation, destructive power, and conservation • Defining criteria and changing of land use in catchment area • Monitoring and controlling of building establishment and utilisation
PerumJasaTirta	• Operating the implementation of water resources infrastructures • Conducting preventative maintenance which consists of routine and periodic maintenance and small improvements to infrastructure • Protecting water resources and their infrastructure • Conserving water resources and controlling damage power • Flushing in terms of river management • Monitoring, evaluating, and distributing information on water quality • Providing technical recommendations and advice to water resources manager in water resource utilisation

INSTITUTION	ROLE AND RESPONSIBILITY
Provincial/Regency	
River Basin Territory Water Council (TKPSDA)	• Recommending water allocation for irrigation needs and other uses to the governor • Strengthening Water User Farmer Association (HimpunanPetaniPemakai Air/HIPPA) • Facilitating formation of river conservation community • Suggesting to governor tocontroll illegal sand mining by relocating the mining site to the area near the check dam and the sand pocket of Kelud Mountain • Proposing formation of conservation village modelling
Forestry agency	• Formulating technical policy in forestry • Building and implementing participation in managing forest area • Monitoring, conserving and controlling the forest area
Marine and fisheries agency (DKPi)	• Planning and implementation of marine and fisheries management
Industrial and Trading Agency	• Giving public service on business permits and implementation based on industrial and trading sectors
Meteorology, Climatology, and Geophysical Bureau (BMKG)	• Formulating national and general policy • Coordinating among policy, planning and programme implementation, supervising, and controlling observation and data and information management • Providing data and information, and information delivery related to climate change and disaster
University	• Researching in water resources sectors
Indigenous community group	• Mediating and giving advice between indigenous people and the government
Government-owned drinking water company (PDAM)	• Provisioning and distributing of clean water to their customers
Industry	• Using river as clean water supply for industrial activities and obeying the waste water discharge standard
Cleaning and Gardening Agency (DKP)	• Developing technical policy and implementing technical garbage management and maintenaning city parks
Water Resources Management Bureau (Badan PSDA)	• Developing technical policy and implementing technical solutions for water resources management, irrigation, and drainage
Village government	• Water users
Local NGO	• Researching, developing the community, and campaigning
Private drinking water company	• Provisioning and distributing of clean water to their customers
Bottled water company	• Water mining in river basin area for their raw materials • Providing drinking water • Providing CSR to conserve the water or environment
Local donor institutions	• Providing small funds
Bureau coordination of government and development (BKPP)	• Coordinating planning and implementation of development in regions
Perhutani	• Planning, utilising, and conserving the forest in the working area
PTPN	• Working in plantation, management, and marketing plantation crop

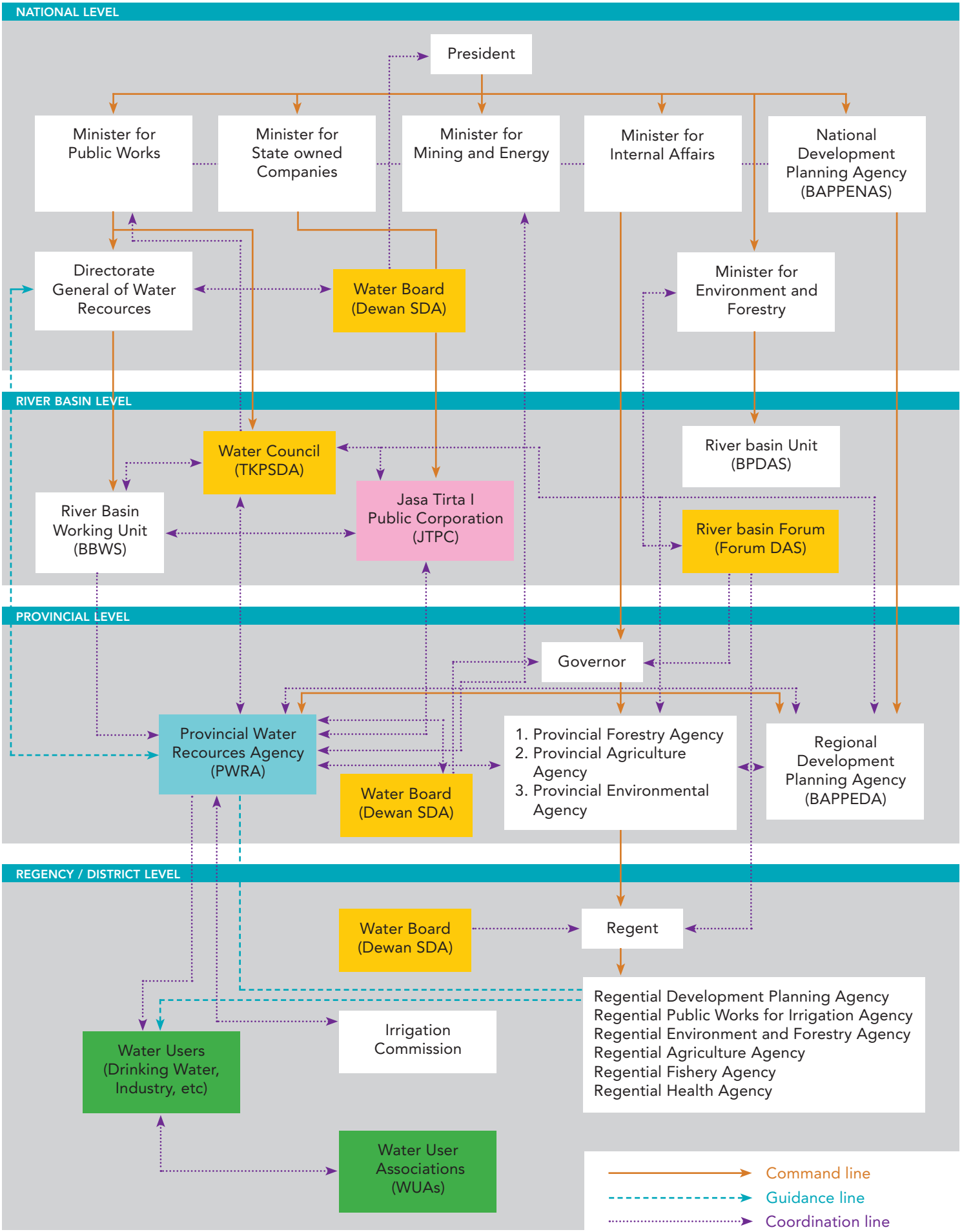

Figure 1 • Institutional Framework for River Basin Management in Indonesia, adapted from Bhat et al, 2007 and Widyaswari, 2015[19]

2.5

COMMUNITY BASED MANAGEMENT

Local knowledge and practices have played an important role in water management at local level. For a long time communities were able and allowed to manage their own water resources. This can still be found in upstream areas, but for various different reasons this practice is disappearing – and with it the local knowledge. A typical example of community based management can be found in the community that lives in Toro village in Lore Lindu National Park, which has been practicing sustainable and inclusive integrated spatial and water management for years. Toro's divide their territory into six zones:[20]

- 'WanaNgkiki': this is a core primary forest zone where communities are forbidden to carry out any activity.
- 'Wana' and 'Pangale' is a primary forest zone and a water catchment area that has become the habitat for rare plants and animals. No-one is allowed to have farmland here, the area is only used as a hunting and collection area for dammar sap, wood, rattan and medicinal plants. There is no private ownership for the land possible, only for dammar trees.
- 'PahwaPongko' is a mix of semi-primary and secondary forest, usually a forest which was used as farmland before. PahwaPongko has the same guidelines as Pangale: only collective land ownership is possible; dammar trees can be privately owned.
- 'Oma' is a forest that has been and is still allocated for farming. In this area, private ownership is acknowledged.
- 'Balingkea' is farmland where fertility has been decreasing. The Toro community uses this area to grow rice and other crops.

Toro's assigned water manager, called Topahilolongaue, is responsible for regulating the economical functions of water (irrigation and basic needs) and must guarantee that water is distributed to all water users equally. Water is considered the vital basis of ecosystems and is owned collectively. The sustainability of water management thus depends on cooperation within the community. This management system (which also determines spatial planning) helps the community to have a sustainable water supply and reliable livelihoods. It also leaves the community members in a strong bargaining position vis-à-vis outsiders. The Toro belief that some places and natural phenomena (particularly springs and trees) are sacred also helps them conserve water resources. Another well known example of sustainable community based water resources management is the Subaks system in Bali.

Governments often disregard local knowledge and consider it irrelevant when it comes to water resources management. There are also examples of government interventions eliminating people's belief in the sacredness of nature (e.g., the case of the Omang and Ngloro lakes[21]). It is important, however, to adopt and revive local knowledge in the development of inclusive and sustainable water resources management models.

2.6

CHALLENGES

2.6.1 Critical watersheds

Around 64 out of 470 watersheds in Indonesia are in a critical condition according to the criteria established by the Forestry Minister's Decree No. P.60/Menhut-II/2014. Of those critical watersheds, 12 are in Sumatra, 26 are in Java, 10 are in Kalimantan, 10 are in Sulawesi, 4 are in Bali and Nusa Tenggara, 4 are in Maluku, and 2 are in Papua.

2.6.2 Groundwater

The availability of groundwater is threatened by overextraction and contamination. Overextraction creates water shortages and causes land to subside in coastal areas. Pollution constrains the availability of groundwater as a safe source. These challenges are felt very strongly in Jakarta, which is one of the fastest-growing urban areas on earth, growing faster even than Beijing or Bangkok. Currently, about 64% of the city's population and the majority of industries rely on groundwater. The urbanisation of what used to be agricultural areas strongly hampers groundwater recharge by rainwater infiltration because of the construction of impervious pavements. The ever-increasing extraction and the lack of recharge of groundwater contribute to a fast depletion of groundwater and dramatic land subsidence in the area:[22] subsidence rates along the coast vary from 9.5 cm/year to 21.5 cm/year[23].

2.6.3 Droughts

Even though water is abundantly available in Indonesia, water deficits occur with increasing frequency, especially in densely populated areas. The National Agency for Disaster Prevention (BNPB) stated that 86 districts/cities in 20 provinces faced drought in 2014. 18 of these districts

Fisherman throws out his net in Kampar River, Sumatra

are located in Central Java, where droughts have become a yearly event. Another area that experiences annual droughts is Southeast Nusa[24,25].
Drought events have a strong impacts on agriculture and productivity:[26,27]

- The area of rice paddies reduces with with 350,000 ha/year, which is equivalent to a reduction of productivity of 780,000 tons of rice/ year.
- In the period 2003-2011, 1,411 drought events were recorded, affecting 1,667,766 ha of farmland.
- In 2014, inhabitants of Tabir village, Jambi, had to consume water from a swamp, which was also used for cattle husbandry[28].
- In the same year, water companies in several areas were forced to practice water rotation, due to the limited lack of water availablilty, for instance in Sukabumi District (West Java)[29]. Water rotation means that water is delivered only to certain areas at a time, so customers have to wait for their turn.

2.6.4 Floods

Flooding is a common phenomenon in Indonesia. Three types of floods are found in Indonesia: (i) most floods present themselves as ***flash floods*** of short duration (bandjir BANDANG) at the foot of mountainous areas because of the relatively short rivers that lack enough flood plane capacity to accommodate the flood waves; (ii) ***riverine floods*** of longer duration (weeks, months) occur in rivers such as the Kampar River where flood planes are regularly inundated due to rainfall upstream and local drainage congestion; and (iii) ***coastal floods*** that are affected by high water levels at sea and subsidence of coastal areas, in addition to heavy upstream and local rainfall. All types of flooding are increasing due to a few general trends: deforestation and urbanisation in the water sheds and flood plains, subsidence in the coastal areas, and climate changes (more extreme rainfall and rising sea levels). The damaging impacts of flooding continue to increase because more people and more economic activities are present in the affected areas.
Jakarta in particular suffers from more frequent and disastrous floods. An example is the flood that occurred on February 2, 2007, which affected 80 districts, causing traffic chaos and paralysing the city. More than 70,000 houses were inundated with water levels ranging from 10cm to 5m, 69 people were killed and an estimated 400,000 people were displaced. The Indonesian government estimated that losses amounted to Rp 4.1 trillion (US$ 450 million)[30].

2.6.5 Water quality

The poor and further deteriorating ambient water quality (both surface and groundwater) is considered the most pressing water management issue in Indonesia. The alarming reduction in the availability of safe water has started to affect public health. No institutional management mechanisms seem to be in place to addres these problems (lack of monitoring and enforcement).

The Citarum River, for example, is infamous for being one of the most polluted rivers in the world. Former environmental minister Balthazar Kambuaya stated that 75% of Indonesian rivers are polluted[31]. River water quality in Indonesia is affected by domestic waste as well as industrial and agricultural waste. River water monitoring was carried out in 30 provinces in 2004, with samples taken twice that year. The monitoring result indicates that parameters of dissolved oxygen (DO), biological oxygen demand (BOD), chemical oxygen demand (COD), fecal coli and total coliform were mostly above the class 1 of water quality standards I under Government Regulation No. 82/2001.

Of special concern is the fast increasing contamination from heavy metals and other chemical substances by uncontrolled mining and industrial

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developments. For example, The Citarum River which provides 80% of the surface water to 10 million inhabitants of Jakarta contains mercury levels that are four times the recommended level and carries unsafe amounts of iron and lead[32,33].

2.6.6 Erosion

Watershed and river erosion present increasing problems that are not adequately managed and controlled through the existing agencies and legal framework. The increase of high and very high levels of severe erosion is mainly due to human activities on the land, such as over-cultivation and land clearance. The expansion of certain forms of dryland agriculture is an important factor worsening the situation. One of the most prominent examples is the highly profitable but ecologically destructive potato cultivation on the Dieng Plateau. Rudiarto and Doppler found that most of Dieng Plateau had dangerously high erosion levels in 2006 with a soil loss rate from 62 up to more than 2,000 tons/ha/year.

River erosion is a natural phenomenon of a mobile system of meandering and braided rivers, in which erosion at some locations is compensated by sedimentation elsewhere. The natural dynamic balance, however, is being disturbed by widely present reservoirs and sand and gravel miningThis increases river erosion in the more downstream river stretches.

2.6.7 Sedimentation

Watershed erosion and subsequent sedimentation have been causing major problems for reservoirs and dams in Indonesia. For example, in the Brantas River Basin, increased soil erosion rates reduced the initial storage of the Sengguruh reservoir of 7,6 million ton in 1988 to 900,000 ton in 2005[34,35].

The increasing sedimentation from the rivers also poses a serious threat to coastal coral reef ecology. Research shows that land-affected reefs in Indonesia have lost 30–60% of their coral species diversity34 in a fifteen year period. The observed reef degradation is partly due to the increased turbidity of coastal waters, which reduces photosynthesis and reduces the maximal depth at which corals can survive[36].

2.6.8 Groundwater overextraction and pollution

Indonesian groundwater sustainability is at stake mainly due to poor management, such as a lack of monitoring and enforcement, overlapping tasks and responsibilities, and a lack of guidelines for local and regional authorities. Groundwater pollution is an alarming issue. The fact that most rivers flowing through big cities in Indonesia are polluted, forces the authorities and population to extract massive amounts of clean groundwater from a limited supply.

Concerned citizens in Bogor city collect waste from the Ciliwung River, West Java

Fishing boats in the Kampar River near Batu Songgan village, Sumatra

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3 INTEGRATED WATER RESOURCES MANAGEMENT IN INDONESIA

3.1

THE CONCEPT OF IWRM

The recognition that water plays a central role in industrial, agricultural, economic, social and cultural development has over the past half century led to the development of strategic management approaches based on the concept of integrated water resources management (IWRM). IWRM propagates a holistic approach to water management by involving and ensuring multi-stakeholder participation in decision making processes. IWRM has been advocated as the most sustainable means to incorporate the multiple competing and conflicting uses of water resources ever since the first UNESCO International Conference on Water, which took place in 1977 at Mar del Plata, Argentina. The concept was re-endorsed during the International Conference on Water and the Environment (ICWE) in Dublin in 1992, which resulted in the Dublin Statement on Water and Sustainable Development. The Conference stated the need for concerted action to reverse the trends of overconsumption, pollution, and rising threats from drought and floods, and formulated four principles to guide action at local, national and international level:

Principle No. 1 - Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment. Effective management demands a holistic approach, which links social and economic development with protection of natural ecosystems as well as land and water uses across the whole of a catchment area or groundwater aquifer.

Principle No. 2 - Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels. This implies that decisions are taken at the lowest appropriate level, with full public consultation and involvement of users in the planning and implementation of water projects.

Principle No. 3 - Women play a central part in the provision, management and safeguarding of water. This requires positive policies to address women's specific needs and to equip and empower women to participate at all levels in water resources programmes.

Principle No. 4 - Water has an economic value in all its competing uses and should be recognised as an economic good. Within this principle, it is vital to recognise first the basic right of all human beings to have access to clean water and sanitation at an affordable price.

IWRM got further mainstreamed into global policy after the World Summit 2002 on Sustainable Development, and was endorsed by international institutions such as the UNDP and The Global Water Partnership. International financial institutions such as the World Bank and the Asian Development Bank adopted the IWRM concept. They have convinced many of their borrowing countries to adopt the IWRM concept in their policy documents and formal planning. At some point it seemed that using the IWRM term became more important than actually solving water problems. This transformation of an idea into a "sanctioned discourse," of a means into an end (backed by loan conditionality), can divert attention from actual water problems and national priorities"[37].

Though the principles of IWRM were thus widely recognised and subscribed to in policies and regulations, many bottlenecks and pitfalls were revealed over the past 20 years. In an attempt to overcome the problems, additional principles and guidelines were developed, including: how to account for environmental values, such as biodiversity, and social and cultural values; how to adapt IWRM theory to local contexts; and how to ensure genuine public participation. An example of such principles is the following:[38]

1. IWRM should be applied at catchment level.
2. It is critical to integrate water and environmental management.
3. A systems approach should be followed.
4. Full participation by all stakeholders, including workers and the community.
5. Attention to the social dimensions.
6. Capacity building.
7. Availability of information and the capacity to use it to anticipate developments.
8. Full-cost pricing complemented by targeted subsidies.

9. Central government support through the creation and maintenance of an enabling environment.
10. Adoption of the best existing technologies and practices.
11. Reliable and sustained financing.
12. Equitable allocation of water resources.
13. The recognition of water as an economic good.
14. Strengthening the role of women in water management.

As recognition grew that IWRM is a difficult concept to achieve in practice, experts agreed on the following main difficulties in implementing IWRM:[39]

- **Sectoral integration.** The combination of organisational culture, personalities and participants' attitudes can pose a major obstacle to integration and cooperation in integrated land, water and ecosystem management. Participants may fear losing authority or influence. Hidden agendas, fuzzy legitimation, unclear functions also undermine integration. In this sense, the main obstacles to institutional reform are limited capacity, low public awareness, poor political support and inadequate funding.
- **Environmental integration.** Environment is often a weak component in IWRM because of a lack of ways to assess the environmental (and also social) benefits and costs of environmental flow regimes. An environmental flow is the water regime provided within a river, wetland or coastal zone to maintain ecosystems and their benefits where there are competing water uses and where flows are regulated. Environmental flows provide critical contributions to river health, economic development and poverty alleviation. They ensure the continued availability of the many benefits that healthy river and groundwater systems bring to society. Developing scientifically established ways to assess and compare costs and benefits of the different scenario's for the different environmental flow regimes is a necessity to strengthen the environmental sustainability and social equity components of IWRM[40].
- **Political, social and economic dimensions.** Calder (2005) stated that the lack of IWRM implementation is to a large extent due to a lack of understanding of the political, social and financial conflicts. Politics need to address the multiple functions and purposes of water and strike a balance between economic development, ecosystem functioning and social equity. Ignorance of the political dimension of IWRM among international proponents (such as the World Water Council, World Bank, and other donors) led IWRM practitioners to understand IWRM as a purely technical and economic approach. This led them to continue business as usual under the cover of IWRM discourse.
- **Repercussion at local level.** The challenges of integrated land, water, and ecosystem management can only be met by management at the lowest possible levels. While the national management level has certain responsibilities, the local level carries important responsibilities in terms of, for instance, community based catchment management, organising irrigation users and urban water utilities. Reforms at the national level are needed to empower management at lower levels, including full cost pricing for all water service delivery.
- **Spatial planning and land use management.** In practice, IWRM has focused on water and disregarded land use management. However, the use of land for human settlements, economic activities and nature not only determines the demand for water, but also is a factor in the availability of water, both in terms of quantity and quality. Land use management in itself requires a planned integrated approach (spatial planning). This often belongs to the responsibility of regional governments, which, however, lack capacity for realising effective spatial planning.

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3.2

IWRM IN INDONESIA

The IWRM concept was introduced to Indonesia by 'force' through a policy reform support loan of US$ 1,5 billion from amongst others the World Bank and Asian Development Bank. This loan aimed to solve the economic crisis that hit Indonesia in 1997. This resulted in Water Law No. 7/2004 and an integrated water resources implementation plan[41]. The Indonesian government defines IWRM implementation as an integrated approach to plan, implement, monitor, and evaluate the conservation and utilisation of water resources and the control of water disasters. Success indicators for IWRM implementation were formulated for three key implementation areas: policy, institutional framework and management (see Table 3)[2].

3.3

FAILING IWRM IN INDONESIA

Indonesia faces a diversity of challenges in water resources management, including deteriorating water quality, degradation of watersheds, groundwater over-extraction, water pollution, floods, droughts, erosion and sedimentation (see chapter 2.6). These challenges illustrate that (i) the wellbeing and livelihoods of local people are affected; and (ii) management solutions become more and more complicated and require concerted action. Because of growing populations and economic activities, local and 'isolated' solutions are often not possible or cannot provide the final answer. At the same time, the institutional capacity — in terms of funds, professional staff (number of people and technical knowledge), mandates and legal tools — of national and regional authorities is absolutely insufficient to meet the challenges.

In addition to the list of difficulties identified in the international discourse on IWRM, the following specific failures have been identified for the Indonesian context:

- **Overlapping policies and regulations among government institutions, horizontally and vertically.**
  IWRM at river basin level is hampered by different mandates, regulations and policies among government institutions. A major problem, for example, is the unclear status of land in fragile watershed conservation areas and along river banks. This causes unsettled conflicts about land, natural resources, and environment among the various ministries, including Public Works, Mining, Environment and Forestry, Environment and Maritime Affairs and the national land agency (BPN). IWRM is also hampered by district governments granting land use permits for plantations or housing in river basin areas that support ecosytem functions or livelihoods.

PILLARS		
POLICY	**INSTITUTIONAL**	**MANAGEMENT**
• Availability of water resources related policies, strategic water resources management plan, and water resources management plan • The availability of regulation that supports water resources management in river basin territory (RBT) • The implementation of cost recovery system for water resources management in river basin territory (RBT)	• The availability of a legal basis (laws, regulations, and institutions) for the establishment of water resources management in RBT • The availability of definite job descriptions for each division • The availability of a coordination board for water resources management (TKPSDA) • The implementation of capacity building activities	• The understanding of the supply and demand of water resources • The implementation of water resources management plan and demand management • The implementation of awareness campaigns • The availability of water conflict resolution procedures • The availability of water allocation procedures • The availability of management instruments/ procedures/ work instructions • The implementation of economic instruments for efficiency, for example a progressive tariff system • The availability of information systems in IWRM

Table 4 • Indicators of IWRM pillars / Source: Public Work and Housing Ministry (PUPERA), 2011

- **Lack of coordination and communication among government institutions.** The Ministry of National Development Planning (BAPPENAS) states that coordination of implementation, monitoring, and evaluation of policy performance and development programmes by the different government bodies is weak. River basin management plans from the Ministry of Public Works and Housing (PUPERA) are not in line with catchment area management plans made by the Forestry and Environmental Ministry (KLHK)[42]. An example in the downstream area of Ciliwung River is the constructed revetment (19 km) by PUPERA which disturbed the lives of riverine soft shell turtles, which are on the IUCN redlist of endangered species.
- **'Unclear' responsibility and authority among government institutions.** IWRM implementation is inefficient due to the overlapping responsibilities and authorities between BBWS/BWS, TKPSDA and other river basin related bodies such as BP-DAS under the Ministry of Environment and Forestry. Overlap for example occurs in groundwater and surface water management, water quality and quantity management, and the conservation and utilisation of water and river related resources. This leads to a lack of accountability. The national government recognised these problems in the annex of presidential decree (PP) No. 33/ 2011 on water resources national policy.
- **Lack of access to adequate and reliable data.** Data relevant to IWRM at basin level are scattered among different government institutions. Many institutions collect and manage data and information on water resources, but the quality of data and exchange of information meet obstacles[43,45]. For the Brantas Basin for instance, hydrological data is available in the Irrigation agency, BBWS, and JasaTirta I, while data on water quality are collected by the Environmental Agency (BLH), JasaTirta I, and the state-owned drinking water company (PDAM). These institutions have their own sampling station for measuring water quality and fail to share data among each other.
- **Weak law enforcement.** The Indonesian government often fails to enforce laws that protect people and the environment. This is partly due to the lack of capacity and capability for monitoring by BLH[44], but also due to lack of knowledge on environmental laws by law enforcement officers, such as judges[45,46]. Environmental cases often need scientific verification. Due to the lack of knowledge and scientific data, cases and evidence brought to the court are often very weak[46]. As a result, industrial pollution has become an environmental problem without end, with many cases remaining unresolved[47].
- **Community participation in IWRM implementation is not represented equally and is limited.** One of the widely recognised causes of the above mentioned failure to develop and implement IWRM is the lack of involvement of local people and communities. Participation is often limited to public consultations, where communities can merely react to plans that have already been decided. The government has installed coordination forums called River Basin Territory Water Councils (TKPSDA), which claim to represent all stakeholders in river basin territories (wilayahsungai). However, in practice, CSOs and communities that are monitoring environmental problems and are concerned with conservation and IWRM are usually not accepted as members of the TKPSDAs. In addition, capacity building is needed for community representatives to understand the coordination mechanisms in which they participate and become

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credible in their demands. For example, it was found that in some cases a poor representation had resulted in conflicts among irrigation farmers[48,49].

- **Centralistic water governance.** Management of the country's water resources is centralised in Jakarta, which was formalised after the installation of Water Law No. 7/2004. The central government is now formally in control over 67 river basin territories. While in numbers this is around 50% of the total of 131 RBTs, it represents a much higher percentage in terms of population and economic activities. The annulment of the authority of the East Java Province for management of the Brantas River Basin by making this basin into a national strategic basin illustrates this trend[50]. The strong centralistic water resources regulations have made decision making processes long-term affairs, and have diminished the role and possibilities of local organisations to be involved water resources managmeent in their areas[51]. It also hampers local actors such as communities in their sense of ownership of water related issues and in taking initiative to manage their own natural resources based on local needs and interests[52].

The failure of IWRM implementation in Indonesia has been outlined in a mountain of documents and policy statements. Unfortunately, however, without much result, and worse, without a promising outlook that the future will bring positive changes towards a more integrated and community based water resources management. This in spite of the formulation of new laws and regulations (such as the presently revoked – Water Law No. 7/2004) and the establishment of new coordinating bodies such as the National Water Council and the TKPSDA.

The ambient water quality conditions of Indonesian's surface and groundwater resources is THE most pressing problem in the sense that people and their economy are affected while the government seems powerless to take appropriate action. This has strong national, regional, and local dimensions and requires a coordinated approach in which each level has its own responsibility and tasks.

Traditional fishing equipment in Brantas River, Kediri regency, East Java

4 THE NEGOTIATED APPROACH

4.1

THE CONCEPT

The Negotiated Approach (NA) places the stakeholders with different interest in a fair and equal position vis-à-vis eachother in water resources management, and produces results that are acceptable for every stakeholder[53]. The NA directs IWRM into managing water resources with a local concept. This means that water resources management for each river basin has its own characteristics based on ecosystem conditions, social and economic community aspects, local knowledge, etc.[54] NA principles thus are in line with community participation principles in IWRM.

Communities often are the vulnerable groups in the negotiation process due to a lack of information and space for them to raise their interests. Busyairi (1997) stated that people or communities need eight assets for negotiations, two of which are: access to information, and the formation of groups or alliances and networks[55]. Communities that have information, knowledge, build alliances and organise themselves into groups or networks will have a stronger bargaining position.

The negotiation purposes are achieved by the availability of information and the involvement of all stakeholders exchanging and discussing their interests and solutions from equal positions. The conventional approach in integrated water resources management (IWRM) often does not yield the desired results because it is implemented in a top-down, techno-economic manner, which reduces or eliminates community participation. With the NA, negotiations can produce efficient, cost-effective, and cooperative-based agreements and 'resolutions'. Agreements reached in negotiations can be more creative, sustainable, and satisfactory to the parties than those imposed through the conventional methods of conflict resolution. Negotiations can also serve to mend or improve the relationships between parties when the focus is on the identification of shared interests, common goals and cooperation. When parties craft a solution themselvesvthrough negotiations they are generally more committed to follow or execute the agreement.

Table 4 summarises important differences between a conventional approach for decision making based on technical and economic criteria and the Negotiated Approach, which gives local communities a voice in decision making.

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CONVENTIONAL APPROACH (TECHNO-ECONOMIC)[56]	NEGOTIATED APPROACH [57]
Top–down approach is notorious for taking much more time than initially planned, for example in techno-economic, large-scale infrastructure projects such as large dams	Bottom–up approach, which is much more holistic and based on practical processes, but it is also criticised for being too time consuming
Centralised, supply-based approach that deals with water resources management based on economic considerations	An effective and democratic approach to solve problems by assessing different water uses and encouraging stakeholders to reach agreement through negotiations and to commit to decisions taken
Practicing sectoral planning: each sector or department prepares plans with a single objective plus one or two additional functions for improving viability of the projects	Optimising the use of water resources by mobilising parties that have an interest to apply an integrated planning approach that goes beyond sectors. This planning is based on assessment of the local social, institutional and environmental situation
Based on limited information about ecosystems that are considered not important enough for serious decision making. The absence of information and unwillingness to include these aspects leads to highly biased and dogmatic views	Based on the conviction that there are strong links between sustainable livelihoods, healthy ecosystems and sustainable water resources management (long-term perspective)
Fails to recognise the needs and knowledge of individual, often vulnerable, communities	Empowers local communities to assert their basic rights to water. Water is considered a social good and as much as possible remains a public, communal resource
Coordination tends to be monopolised by government departments with practically no participation from local citizens. Consultation might be practiced, but this is not the same as open and transparent participation	Taking decisions by consensus at the lowest appropriate level. An essential prerequisite for applying the principle of subsidiarity is increasing the capacity at all levels of local authority and all community members to come to a consensus

Table 5 • Distinguishing characteristics between conventional and negotiated approach in IWRM

Platforms for negotiation are needed to promote and facilitate collective action to manage common natural resources. Kerr (2007) stated that the benefit of making platforms in the implementation of IWRM is that it will improve the management with regard to:[58]

- Decisions on the utilisation of water resources are based on the interest of all stakeholders.
- Decision-making includes the lowest possible levels.
- Open and voluntary communication is established to solve inequality (gender, ethnic, education, and skills) and avoid domination by authorities.
- Strategies and actions are agreed which break down an authority structure that ultimately will hamper a collective action.
- Platforms that evolve from a smaller scale are more effective to solve the complexity of water resources management than more top-down platforms.
- The presence of a third party that acts as facilitator for collective action will expedite the negotiation process and protect the interests of vulnerable groups.

Table 5 highlights similarities between participatory approaches and the NA. There is, however, an important difference between the two. In the NA, the stakeholders participate in an active process to establish a common agreement. In participatory approaches, communities are usually being heard and involved in socialisation only to comply with established procedures to be followed by governments and private industrial interests. They are not involved in the decision making process itself. This is also the reason why communities complain or endorse petitions against government management that claims to be participatory without allowing communities to influence management[59].

PARTICIPATORY PRINCIPLES[56]	NA AIMS[53]
Prioritising local initiatives and keeping the balance in terms of gender involvement	Endorsing communities in delivering their opinion openly as stakeholders who have an interest in and a relation to water resources
Keeping the flexibility of involvement at different levels and creating transparency and accountability	Ensuring water resources management becomes a collective responsibility by all the stakeholders
Optimising water resources utilisation through integration by implementing knowledge and appropriate technology	Ensuring the sustainability of ecological, social, cultural, and economic functions of water resources systems
Decision making should be done through consensus at the lowest possible level	Ensuring community participation in the processes of planning, implementation, and controlling of water resources management activities

Table 6 • The similarity of participatory principles and NA aims in IWRM

Fisherman in Kampar Basin

NOTES

56 BothENDS and Gomukh. 2005. River Basin Management: Negotiated Approach. www.bothends.org

57 BothENDS and Gomukh. 2011. Involving Community. www.bothends.org

58 Damayanti, Astrid. 2010. Spatial Development Policy Based on Integrated and Sustainable Water Resources Managementw

59 Partowijoto, A. 2012.Community Participation through Negotiated Approach in Integrated Water Resources Management to Support Food Security. Summary of Water Resources Management to Support Food and Energy Security Papers

4.2

TOWARDS A NEGOTIATED APPROACH IN INDONESIA

Experience in Indonesia with NA implementation mainly concerns strengthening the capacity of communities to endorse their ideas and interests in water resources management, and initiating negotiation platforms at local level that explicitly give them space to raise their voices. One example is the Lamasi River Basin Council (LRBC), which was created based on a NA model by a local NGO and the district head. The LBRC was established to ensure community participation in the planning, implementation and control of water resources management at basin level. It proved to be a valuable learning exercise (see the box below). Within just a few years it became clear that the authorities were not willing to really share information and discuss development plans with local people, or to seriously embark on a joint long-term exercise. The lesson learned is that cooperation between civil society and government agencies to build local institutions is only useful if local communities have the means and capacity to use and enforce the continuation of such institutions. The fact that this was not the case in Lamasi, should have been addressed immediately.

In the annex three additional efforts to establish discussion and negotiation platforms are described: an informal project-based NGO effort to analyse the problems in the Kampar Basin; an informal university-NGO initiated consortium with participation of government agencies on regional development issues in the Upper Cilliwung area; and a government-endorsed NGO initiative to improve the water quality and establish a fish sanctuary in the Surabaya River. Table 6 summarises the main characteristics of these three efforts.

Though these efforts differ considerably in terms of their format, status, composition and the problems they address, they all coincide in their endeavor to formalise the platforms they established and make them play a role in water resources management as a permanent meeting place for all stakeholders involved.

When evaluating these efforts, several weaknesses are apparent, including a lack of structure and procedures, insecure funding, a lack of commitment, frequent rotation and existing hierarchy among government participants. However, it is also found that participants enjoy the open though non-committal discussions and that it is relatively easy to get stakeholders together and discuss problems. Platform meetings are thus experienced as a unique possibility to meet 'the other'. The question, also based on the Lamasi experience, still remains how these platforms can be formalied and more commitment created without losing the appreciated open discussion. In this sense, the experience so far appears to suggest that government agencies are slowly getting used to these platforms as they provide practical ways to decide on useful ideas from below and implement them. The willingness to give the platforms a more formal place in government decision making also seems to be growing, like in the Surabaya River. Comparable experiences from other NGOs confirm this conclusion. This encourages IndoWater Cops' drive to use the NA in its aim to contribute to the improvement of IWRM in Indonesia.

The Lamasi River is a small, 70 km long, river in South Sulawesi with an area of about 48,700 ha and a population of about 56,00 (2009). Deforestation, and concessions for mining activities threatened the livelihoods of farmers, fishers and sea weed cultivators, while the quality of public services was deteriorating. Community initiatives led to a district regulation (Perda) on the management and conservation of resources in the Lamasi Basin in 2006, which in the year 2010 resulted in the formal establishment of the Lamasi River Basin Council (LRBC). This council consisted of four government officials and seven representatives of civil society. In 2013 the LRBC was suspended after 3,5 years of struggle because of lack of funds and training of the council members and what can only be described as non-committed government agencies (no access to data, low level representation, absence in meetings, etc).

Characteristics	DAS KAMPAR Integrated Kampar Basin Initiative	DAS CILIWUNG Save Puncak Consortium	DAS BRANTAS Surabaya River Water Quality and Fish Sanctuary Cooperative
Form	Non-structured and informal multi-stakeholder forum	Structured and informal multi-stakeholder forum	Structured and formal multi-stakeholder forum
Status	Timely project	Ciliwung charter	Government decree
Working area	Upper, middle and lower Kampar Basin	Upstream area of Ciliwung River (Puncak focus)	Surabaya River in downstream Brantas Basin
Problems	• Land use conflict by forest conversion for palm oil and other plantations • Water pollution • Lack of sanitation and clean water facilities	• Privatisation and illegal use of water resources • Land slides • Water pollution • Land use control and changes	• Water pollution • Use of river banks for houses and industries • Lack of sanitation facilities • Fish biodiversity extinction
Vulnerable groups	• Local fishermen • Local farmers • Households	• Local farmers • Households	• Local fishers • Households • PDAM
Task	• Data collection and research • Advice to government • Stakeholder coordination • Empowerment of local communities	• Data collection and research • Stakeholder coordination • Empowerment of local communities • Evaluation of government policy and programmes • Garbage collecton from river	• Data collection and research • Advice to government • Stakeholder coordination • Development and evaluation of stakeholder programme • Empowerment of local communities • Legal action and advice • Monitoring of water quality
Procedures	• Formal and informal meetings • Interviews with stakeholders • Village meeting/consultation	• Formal and informal meetings • Stakeholder meeting • Consultation with government and communities	• 3-monthly multi-stakeholder meetings • Consultation with experts • Reporting to the Governor
Funding	Project	Community, private sector and government	Government, industries, NGOs and donors
Achievements	• Uniting the stakeholders into a forum • Joint identification of problems • Orientation on clean water and sanitation in the basin and in a selected village	• Thematic maps • Participatory planning documents for 12 Kampungs and 2 villages • Forest rehabilitation with community • Ecotourism programme • Regular action in garbage collection • Arrangements for waste management in community	• Improved coordination in planning and implementation • Open access to information • Establishment of a fish sanctuary area • Reduced pollution

Tabel 7 • Analysis comparing characteristics of three negotiation platforms in Kampar basin, Ciliwung basin and Brantas basin

Fish catch in the upstream of Surabaya River, Brantas basin, East Java

5 INDOWATER COMMUNITY OF PRACTICE

The Indonesia Water Community of Practice (IndoWater CoP) was declared on December 3, 2014 by a group of Indonesian NGOs whose members felt very concerned about the poor management of Indonesia's water resources due to a lack of integrated planning on river basin management, community participation and law enforcement. Poor management leads to all sorts of problems, most importantly water pollution, water shortage, increased damage from disasters, excessive forest conversion and river bank degradation, biodiversity extinction and uncontrolled mining.

IndoWater CoP started from the belief that the above mentioned problems can be addressed by increasing community participation as part of formal government decision making processes that should take place at the level of river basins instead of administrative units.

Our recent policy and basin analysis revealed that water pollution is the most burning issue within failing integrated water management. The quality of Indonesian water resources is deteriorating at an alarming rate and has become unacceptable. Water pollution has major economic impacts and has started to affect the wellbeing of the people to such an extent that it has attracted international attention. The severe impact on the environment will be felt by future generations. Water pollution in Indonesia is a human induced problem that should be solved by human interventions. The Indonesian government seems both unable and unwilling to take and implement adequate measures to protect people and the environment and to create basic conditions for a sound, healthy and sustainable socio-economic development.

Therefore, in addition to promoting improved community participation in IWRM, IndoWater CoP focuses on addressing the issue of water pollution in national policies.

The NGOs that together make up IndoWater CoP work on manifold water resources issues in Indonesia. They have extensive experience in working with communities and have each developed models for community participation in water resources management. Our aim is to improve these models through networking and shared learning, so they can contribute to participatory integrated river basin management in Indonesia and help address the hardship that communities face due to a lack of access to clean water.

Goal

To support government agencies at different levels to improve performance in river basin management through practicing community participation at all stages of integrated water resources management at river basin level.

Main strategies

Based on our experience with inclusion of local understandings and practices, we intend to:

- further develop and implement models for community participation and create platforms for discussion and interaction among all relevant stakeholders using the negotiated approach
- increase the knowledge and capacity of communities to participate on an equal basis in multi-stakeholder dialogues
- develop cooperative networks with government agencies and other stakeholders to share experiences and practices, and further development of models
- advance NGO actions at local level to national policy level through joint lobby and advocacy, with water pollution as the key issue for the coming years

IndoWater CoP founding members present the IndoWater CoP logo

Roles

NGOs are uniquely positioned in between civil society (which suffers from inadequate government management practices) and formal government institutions (which are often willing but incapable to apply participatory management approaches). NGOs should therefore have an independent role in awareness raising and in addressing the public opinion. Our challenge is to become a credible partner for all stakeholders.

To achieve this, IndoWater CoP aims to operate in three different complementary roles:

- Participate in formal coordination and integration mechanisms such as water councils and try to improve their functioning by adding the voice of the people.
- Organise civil society groups at local level around problems that can be managed at the local level with or without additional support from national and regional government. Help people take control of their 'own' resources, organise their management structure and interact with governments for approval and contributions.
- Address urgent issues by organising protests, media campaigns and legal action.

Ambition

IndoWater CoP's ambition is to critically monitor government performance in the implementation of water related policies and to propose tangible models and platforms for improved community participation in water resources management. A strong focus on water pollution as an urgent niche issue will help us gain visibility and build up credibility in the above-mentioned roles. Moreover, we envision IndoWater Cop as a shared learning place where member NGOs are encouraged to look beyond their individual activities and develop joint, evidence-based strategies to influence national policies.

6 CASE STUDIES OF A NEGOTIATED APPROACH (NA) AND IWRM IN INDONESIA

6.1

SURABAYA FISH SANCTUARY AREA: COOPERATIVE MULTI-STAKEHOLDER FORUM IN WATER POLLUTION MANAGEMENT

6.1.1 Water Resources System

Surabaya River is a branch of Brantas River in the delta area. It flows along 41 km starting from Mlirip Sluice in Mojokerto to Jagir Sluice in Surabaya City. Surabaya River flows through 4 regencies, namely Mojokerto, Sidoarjo, Gresik and Surabaya, with a total catchment area of 55.16 km^2. The average sediment discharge in Surabaya River is 53.512 m^3/s and sediment load range is 0.0437 m^3/year to 202.3869 m^3/year. The average water discharge in 2014 ranged from 25,62 m^3/second to 94,21 m^3/second. The massive change of land use has impacted the quality and quantity of water resources in the Brantas River Basin. Between 2000 and 2008, about 38.255 ha or 52,7% of natural forest was lost to conversion into an agriculture and settlement area, while the residential area increased 57,8% from 265.301 ha to 458.961 ha.

In 2010, Ecoton calculated 3.000 illegal houses and 1.828 open defecation sites along the river bank. About 90% of the domestic waste water discharges into the river without proper treatment. The total E.coli in the raw water intake of PDAM Surabaya was 3.212 times higher than the standard 2.000 cell/100 ml. Surabaya River receives 75 tons of waste water daily, while the river's maximum carrying capacity is calculated at 30 tons a day. There are also hepatitis viruses and parasites such as tapeworm and roundworms colonies found in the Surabaya River. The river water is contaminated by mercury and its concentration is 100 times above the tolerable limit established by the World Health Organization. Tests show that mercury appears in the blood and breast milk of women living within the estuarine area of the Surabaya River and childhood cancer rates are highest among children living along the river, where untreated water is often used for washing and bathing. Despite this heavy pollution level, the local water company PDAM uses the Surabaya River for 96% of its raw clean water supply.

Ecoton found 22 fish species in Surabaya River, including the Bronze Feather Back *(Notopterusnotopterus),* which is a protected fish species under PP No. 7/1999. Ecoton also found 150 medicinal plants.

Surabaya River fisheries are the source of livelihood for fishermen from Jombang Regency. In the seventies there were 100 fishermen, but their numbers decreased rapidly due to the construction of river dams, and the decreasing fish population. The latter was due to a reduction of breeding sites, extensive and illegal fishing techniques which include using bombs and poison, introduction of exotic species, and water pollution. The Surabaya River is an important habitat for Javan Coucal *(Centropusnigrorufus)* and Asiatic Soft Shell Turtle *(Amydacartilaginea)* which are categorised as vulnerable in IUCN's Redlist. The vegetated river bank is a source of natural herbal plants for medicine, such as centella which is known as being anti-cancerous and is being sold as capsulated powder.

6.1.2 The need for IWRM and a Negotiated Approach

The water pollution in the upstream of Surabaya River is dominantly caused by industrial waste water, while in the downstream area the water pollution mainly comes from domestic waste water. Emerging vulnerable groups due to water pollution are women and children who live along the river bank, PDAM and its consumers, and fishermen. Each stakeholder has his or her own interest and limitation in water pollution management. Government institutions related to water resources management and pollution control, such as Environmental Protection Agency (EPA) and Brantas River Basin Territories Organisation (BBWS Brantas), lack control in water pollution and river bank management (referring to sedimentation and organic pollution) due to limited staff, budget, etc. Meanwhile, the community members lack information and/or knowledge, technology, and the opportunity to participate in the various levels of planning. Improving water quality or stopping water pollution is only possible if all stakeholders work together by sharing their tasks, responsibilities and information. The Negotiated Approach (NA) gives every stakeholder the opportunity to share his or her interest, particularly community members who are often left out in the various planning stages. Integrating every stakeholder's (or water user's) interest, which by definition will require mutual compromises, is needed to be able to control water pollution in the Surabaya River.

Platform members in front of the sign that officially announces the initiation of the Surabaya Fish Sanctuary Area

6.1.3 Platform description

Back in 2009, Ecoton proposed to the Governor of East Java to set up a multi-stakeholder coordination platform for Surabaya River Fish Sanctuary Areas (FSA), in order to conserve fish resources, improve water quality and preserve the riparian habitat along the river. Through the FSA programme, Ecoton promoted the implementation of participatory and integrated water pollution management by developing partnerships among the government, businesses and the community. The FSA programme aims to promote water pollution management by improving water quality, maintaining water quantity, and sustaining the ecological services of Surabaya River for the present and future generations.

The governor agreed to set up a Coordination Team for Management of Surabaya River Fish Sanctuary Area (FSA) through Governor Decree No. 188/229/KPTS/013/2014. The members are relevant government agencies, environmental NGOs, industry associations, local community groups and universities. The bottom-up initiated FSA platform is based on 3 pillars, i.e. developing the regional economy, involving the local community and maintaining ecosystem services. The task of the Coordination Team is to establish the FSA from Mlirip Sluice Mojokerto to Legundi Bridge Gresik. Three steps are indispensable when initiating a multi-stakeholder coordination platform for the FSA. It starts with conducting an extensive study on river ecology with an emphasis on the social and economic factors regarding fishing activities. The second step is to build cooperation among various stakeholders including government institutions, the local village government, industries, and academics to set up management plans and share the roles and responsibilities. The stakeholders and their expected roles include:

a. Government institutions; BBWS Brantas is expected to provide permission the to FSA management team to manage the river bank area as a riverine biodiversity park; the Department of Fisheries will provide information boards, conduct fish monitoring studies, control destructive fishing activities, and breed native fish species.
b. Industry associations; improve waste water management, increase water recycling and voluntarily comply with environmental regulations, and support awareness campaigns and sanitation programs.
c. Village governments; set up village regulation to conserve fish populations, set up riparian habitat preservation and rehabilitation, and manage waste management based on community participation.
d. Local community groups; (POKMASWAS) monitor and control fishing activities and industrial waste water discharge, maintain natural riparian habitats, and develop campaigns and programmes.
e. Academic communities; monitor waste disposals and water quality, conduct river clean-ups, and develop research and awareness campaigns.

The third step includes socialisation, widening the network of stakeholders, maintaining the platform and implementing cooperative programs in FSA. Ecoton uses mass media such as newspapers, television, radio broadcasts, online newspapers and magazines to publish information and progress on the FSA project. Twice a month Ecoton goes on air on the state radio to promote the FSA project and invite people to contribute.

6.1.4 Evaluation and Lessons Learnt

The platform was initiated in 2013 and continues to operate as a coordination and communication forum where all members or stakeholders are involved in planning the different stages of the program. Currently the platform is implementing and continuing the cooperative programmes. Some of the collaborative actions implemented by members of the Coordination Team are:

1. The Natural Resources Bureau of East Java Provincial Secretariat has provided regular funding for meetings since 2014. The Bureau has already regionally budgeted for the upcoming, regular meetings and for the implementation of the action plan proposed by the members for 2015.
2. JasaTirta provided funds for Ecoton to develop a pilot project on the ecohydraulic engineering structure for riparian habitat restoration and to stabilise the eroded bank along the fish sanctuary area. JasaTirta also provided plant seedlings to be planted on the river bank such as Arenga pinnata and bamboo.
3. The Department of Marine and Fishery, or Dinas Kelautan dan Perikanan, collaborated with Ecoton and the government of Bogem village to conduct socialisations of the FSA and to encourage community participation in controlling destructive fishing and river pollution in the village.
4. The Environmental Protection Agency, or Badan Lingkungan Hidup Propinsi Jawa Timurhas, supported the FSA by developing a Diversity Park on the river bank and strengthening the pollution control programme in the FSA. Badan Lingkungan Hidup Gresik Regency provide bamboo seedlings planted along the river bank in the FSA.
5. Industries have improved waste water treatment plants that comply with the waste water quality standard set by the government which are open for public visitors; PT Tjiwi Kimia provided a CSR fund for the Government of Desa Penambangan to build a solid waste recycling plant.
6. Communities actively report to Ecoton when they see pollution incidents, river bank conservation or destructive fishing in their area.

The lessons that were learned from the platform:

1. A multi-stakeholder coordination platform can be initiated bottom-up by CSOs with strong support and commitment from a top provincial government leader (Governor). The latter should command its provincial institutions to cooperate in developing programmes and spending regional development budget (APBD) to implement the local initiatives. The governor's decree provides the legalised structure through which also funds are provided for regular coordination meetings to guarantee sustainability.
2. A platform needs to specify the area boundary and determine the priority area, which has a good ecological condition and supports economic activities. The platform promotes community participation in conservation activities.
3. A platform needs to have regular meetings. The FSA platform meets every three months. This helps to maintain good communication and develop further collaborative action, while the members can evaluate the progress of individual or collaborative actions in supporting the river conservation programme. A platform needs to develop a long-term, multi-year plan that can be broken down into short, one-year goals and tasks.
4. A platform needs to develop trust and good communication among members to achieve successful collaborative action. The platform needs active and strong initiators or mediators who provide updated information, maintain personal contact among members, and also can bridge communication among members.
5. To improve community participation in current coordination platforms, we need to increase the capacity and self-confidence of local community groups. Local community members should be able to express their needs and concerns in current formal coordination platforms provided by the government (TKPSDA, BPDAS, Musrenbang, etc.) to support implementation of integrated water resource management in the river basin.
6. The representativeness and selection process of non-government members in the current platform provided by the government in TKPSDA and BPDAS needs to be improved in order to improve transparency, establish a more democratic process in which a larger proportion of the total population is represented and create more impact. We need to advise the government on the mechanism of member recruitment for current coordinated platforms.

Traditional sand and stone mining in Brantas River near Mojokerto regency, East Java

6.2

INTEGRATED KAMPAR BASIN INITIATIVE: INFORMAL MEETINGS TO FACILITATE MULTI-STAKEHOLDER NEGOTIATIONS IN IWRM

6.2.1 Water Resources System

The Kampar River Basin is the largest river basin in the Province of Riau, Indonesia. The total length of the river is 580 km. Its width in the downstream area ranges between 100 and 300 m, while its depth varies roughly between 6 and 10 m. The total area of the basin is 26.038 km^2. The river flows through two provinces: West Sumatra (2.633 km^2) and Riau (23.405 km^2). 10% of the upstream area is located in West Sumatra, whereas the remaining 90% is located in Riau. Quite a substantial part of Riau - about 26% - is located in Kampar River Basin. For West Sumatra, this is only 6%.

Multistakeholder Workshop on Integrated Water Resources Management in Kampar basin, Riau, Sumatra

According to the Ministry of Forestry, Kampar River Basin covers several watersheds, of which the Kampar watershed dominates the basin. Other smaller watershed areas are found on islands in the estuary of the basin. With regard to the range of slope variation, the Kampar Basin and the proximal surrounding administrative areas are overwhelmingly flat with slopes less than 2%. The soil type is dominated by peat and red clay, especially in the middle and lower parts of the basin.

Little water resources infrastructure exist in Kampar River Basin. The main infrastructure is the Koto Panjang Reservoir and Hydropower Plant. The reservoir has a concrete gravity dam of 58m high and a capacity of 1,545 million m^3 with an average annual inflow of 184.4 m^3/s. Three turbines of 38 MW each produce around 550 GWH per year.

Kampar River Basin is inhabited by at least six threatened tree species, including a critically endangered peat swamp specialist tree *(Shorea platycarpa)*, the Sumatran tiger *(Panthera tigris Sumatrae)*, the hook-billed bulbul *(Setorniscriniger*, VU), the Storm's stork *(Ciconia stormi*, EN), the clouded leopard *(Neofelis nebulosa*, VU), flat-headed cat *(Prionailurus planiceps*, VU), the Asian tapir *(Tapirus indicus*, VU), and others.

The usage of the land in the Kampar River Basin has experienced only minor changes in the periods between 2007 and 2010. Half of the basin is protected forest area and about one quarter is occupied by plantations (palm oil, acacia and rubber). About three quarters of the basin falls under the criteria of being in a critical condition. This has to be considered very high for a flat area such as the Kampar Basin and is most likely related to the poor condition of the vegetation cover and the poor management conditions.

The Kampar Basin is located around the equator and has a tropical climate. Temperatures roughly vary between 22 and 30oC and humidity between 80 and 90%. With regard to water flow, Kampar River Basin has had high fluctuations in water flow (Qmax 2,200 m^3/sec, Qmin 49m^3/sec, and QNormal 500-700 m^3/sec).

In 2009, the population in Kampar River Basin totaled slightly over 1 million. Residences were mainly located in Riau Province (which covers about 90 of the basin). This coincides with about 20% of the total population of Riau Province. No major cities are located in the basin, only a small part of Pekanbaru (8% of its area) is situated in the basin. The population is basically concentrated in small rural villages that seem quite equally spread over the province. Population densities are low, especially in the lower part of the basin. The biggest sub-district in the basin is Pangkalan Kerinci (Pelalawan District), which has only about 100,000 inhabitants.

Data and information on water quality are scarce. They are based on monitoring carried out by the authorities and information on waste discharges from industries. In several locations upstream and downstream of the river, heavily polluted areas are present. Sources of pollution include illegal mining (mercury) in the middle reaches, plantations (run off from fertiliser and pesticides), pulp and paper industries (BoD and CoD), sand and gravel mining (turbidity) and waste from communities. Limited treatment facilities seem to exist with the existing pulp and paper factories.

Safe water and sanitation inspection revealed serious situations along the banks of the river where people defecate and urinate while at the same time they use these waters for consumption and bathing, even in situations that other and safer water sources are available.

Vulnerable groups are considered those households that are unable to cope with changes in the availability and access to water, including: agroforestry farmers in the upstream area, fishers and dryland farmers in the central part of the basin.

1. Farmers in the upstream area are seriously threatened by the giving out of concessions that will take away their access to both the land and the water they use for their subsistence agricultural activities.
2. Fishers in the central part of the basin suffer from a decreasing availability of fish due to water pollution that is most likely caused by fertilisers and pesticides. These pollutants drain from the plantations into the lakes alongside the river (danau) that are important for fish recruitment and breeding.
3. Dryland farmers in the middle reach of the river suffer from the drying up of rivers due to deforestation, increased pollution due to mining, or more frequent floods.

6.2.2 The need for IWRM and a Negotiated Approach

From the beginning, Yayasan Mitra Insani (YMI) realised that executing proper and sustainable natural resource management required understanding, involvement and cooperation of all parties concerned. YMI envisions how the river basin can be managed well and sustainably in order to ensure its value to both the population and the surrounding environment.

The reason to use the Negotiated Approach for integrated water resource management is that this provides certainty about the involvement of all parties, especially the communities. The NA aims to strengthen IWRM through the involvement of local communities, whose capacity in natural resources management is at the same time strengthened in order to improve their quality of livelihood. The NA is expected to ensure full and long-term community involvement in problem identification and resolution.

Applying the NA as part of IWRM in Kampar River Basin is based on the condition that the river is in a relatively good condition compared to the other three major rivers in Riau. Furthermore, the government had not yet made as much effort to build a river management plan as in the other three basins. A third consideration was the potential capabilities of the parties to sit together, understand each other and jointly organise and implement activities for the management of the Kampar River Basin regarding:

- The poor and deteriorating water quality of the Kampar River caused by illegal and small-scale mining, oil palm plantations, pulp and paper factories and waste discharges from the communities along the river. Poor water quality in particular affects fishers and local communities.
- Land use and water resources are closely related. About three quarters of the Kampar Basin is covered by forests and plantations. The issue of concessions and the management of these areas thus have a considerable impact both on the river and on the social and economic conditions of

Sanitation facility in a coastal village downstream of Kampar River, Sumatra

the people. Certain communities have lost access to their land while others suffer from the deteriorating water quality and changes in the hydrology of the rivers.
- The widespread problem of deforestation (due to issuing of concessions) affects the access to land and water by local people and has adverse impacts on the hydrology and water quality of groundwater aquifers and rivers.

Access to safe water and sanitation is extremely poor in the Kampar Basin. This is partly due to the persistent local habits to use the river for all purposes of water supply, including waste discharges and defecating. It is also due to plantations and industries that discharge their waste into the rivers and to insufficient government interventions to provide passable conditions at the village level. PDAM, for example, serves only 10% of the population and even those 10% are not provided with 'safe' water.

6.2.3 Platform Description

Crucial in applying the NA is a platform for discussions and negotiations that consists of all stakeholders involved. Formally, the complete list of tasks for facilitating the process of negotiation is:

- task 1: preparing the process
- task 2: reaching and maintaining process agreements
- task 3: joint exploration and situation analysis (problem analysis)
- task 4: identification and analysis of possible solutions
- task 5: forging agreement
- task 6: communication between representatives and constituencies
- task 7: monitoring agreed actions
- task 8: capacity building of participants

As such a platform did not yet consist for the Kampar Basin, during programme implementation (2012-2014) YMI organised frequent workshops for all stakeholders to present and discuss results and to make them familiar with and involve them where possible in the approach itself.

In view of the limited authority and resources, the project focused in particular on task 3, exploring the problems as perceived by the different stakeholders (ambitiously called a Joint Problem Analysis (JPA)). A JPA is considered an essential effort at the start of any negotiation. The aim is to reflect on the problems as perceived by all relevant stakeholders (government agencies, companies and local communities) without prioritising and taking sides. Based on a JPA document a better understanding can be reached among different user groups and managers of the water resources system, which in turn should lead to better decisions for example on priorities for conservation and investments for development. Keeping the limitations in mind, the JPA had the following objectives:

- Finding out whether parties could be brought together and assess the feasibility to generate a genuine JPA under guidance of the government.
- Assessing the accessibility and reliability of available information.
- Assessing whether this limited exercise could indicate priorities that justified further actions.

The JPA started with the collection of data and information on physical, socio-economic and institutional aspects. Results of this effort were presented and discussed in meetings with parties and were documented in a report: 'State of the water resources system of the Kampar River Basin' (YMI, 2015a). The JPA consisted of four main components: (1-3) separate interactions with local communities, government agencies and private companies, and (4) integrated meetings among parties.

6.2.4 Evaluation and Lessons Learnt

The project confirmed the need for a more integrated approach as well as the main bottlenecks for such an approach: (i) the establishment of a platform where all parties participate equally; and (ii) the difficulty to access consistent, reliable and updated information. In line with findings elsewhere, parties in this project also appreciated the opportunities offered to meet and exchange opinions as long as participation is non-committal. However, it was also found that in spite of these bottlenecks a reasonable good picture could be obtained of the viewpoint of different parties and the main problems while access to information improved.

Though the need for integration and the appreciation of the NA was widespread, in reality the responsibilities for management of the resources of the Kampar Basin remain at national level (PU and Forestry). At this level, the possibilities for concerted action – for example through a formalised platform - are difficult to achieve, in particular since the Water Law of 2004 has been revoked and national agencies continue with their business as usual.

Unfortunately, the same is true for several other areas of concern that were identified as priorities: the public water and sanitation situation, the behaviour of people living alongside the Kampar River with respect to MCK (bathing, washing, and defecating), and the water quality.
For YMI's role in water management of the Kampar Basin this could imply the following:

- Developing knowledge on the Kampar Basin as a whole with regard to monitoring social, economic, and ecosystemic interactions. This leads to a more integrated system of Kampar River Basin management. The realised projects will have provided a network of

knowledge that must be maintained to build communication and trust among stakeholders. The successful framework and network of information could be replicated in other areas of the Kampar River Basin.

- Facilitators need to deepen their knowledge, especially in technical aspects related to water resources problems and the Negotiated Approach to endorse the establishment of a formal multi-stakeholder forum.
- Platforms could take ownership and assume responsibility for planning, implementation, operation and monitoring of the water supply, sanitation and waste management systems.
- Participation from government agencies and private companies is needed to support the sustainability of cooperative programmes established by multi-stakeholder processes.
- It is necessary to design the Kampar River Basin management plan starting at the village level (bottom-up planning) and then integrating this with the plans of other parties. This will ensure that the management plan coincides with the real needs and expectations of all parties and ensures community participation in Kampar River Basin management.
- Endorsing replication for the project and results (including the negotiation platform) as a model for other integrated river basin management (IRBM) in other basins.

6.3

SAVE PUNCAK CONSORTIUM (SPC): A TOP-DOWN APPROACH THAT WORKS

6.3.1 Water Resouces System

Ciliwung River is 120 km long. The main tributaries are the Ciesek and Ciluar and catchment areas that are located in the upper catchment. Its river basin consists of 476 km^2 and is located in the Western region of Java where it flows through two provinces, West Java and the special region of Jakarta. The Ciliwung River Basin starts upstream at Tugu Puncak (Bogor Province) and finishes downstream at the Jakarta Bay area.

Ciliwung watershed has an annual precipitation average amounting to 2,913 mm. The rainy season lasts ten months and the dry season lasts two months (Climate Type A in Schmidth Ferguson classification). In the upstream slope variations occur in the range of 15-45% and higher. The midstream is a hilly area, which is dominated by a 2-15% slope variation. The downstream area is a plain area that is dominated by a < 8% slope variation.

Water infrastructures in Ciliwung River include the following dams and floodgates/watergates: Cibalok Dam, Katulampa Dam, Depok Dam, Manggarai Water Gate, Karet Water Gate and Angkehulu Water Gate. Those water gates were built for controlling the water flows. The Cibalok Dam in the upper stream area was built for irrigation while the Depok Dam was built for controlling water surface level. Katulampa Dam was buit in Bogor in 1911 for an early flooding warning system and irrigation of 5,000 ha agricultural land. Highest water flow levels capping at 630 thousand liters/second and heights of 250 centimeters occurred in 1996, 2002, 2007 and 2010.

Garbage collection activity in Ciliwung River, West Java

Ciliwung community's research in 2011 found 20 native fish species, Asian narrow-headed softshell turtle *(Chitra-chitrajavanensis),* otter *(Lutra-lutra),* and Javan slow loris *(Nycticebus javanicus)* in the riparian of Ciliwung. Remaining vegetation along the river also has become the habitat for urban birds.

Based on census data, in the past decades the human population in Ciliwung Basin exploded from 6.4 million in 1971, to 9.2 million in 1980, to 12.3 million in 1990 and reached 13.8 million in 2000.

Ciliwung River is used as clean water supply for households and small industries along the river, fishing spots, irrigation, sand and stone mining, farming and plantation, raw water supply for Palyja (4%), and tourism activities. The changing of land use is out of control, which has decreased land fertility, decreased water quality, caused droughts and floods.

Based on the Environmental Ministry's explanation 'Ciliwung River Restoration' in 2012, Ciliwung River is categorised as 4th tier water quality, which is the lowest water quality level on the government's scale. High Escherichia coli 22 number (116-149/ml) was detected downstream in the Ciliwung River (Yasuda et al., 2012). Concentration of metals, such as manganese (Mn), cobalt (Co), magnesium (Mg), aluminium (Al), and lead (Pb) were detected in Ciliwung River. The high concentration of Mn in two sites of Ciliwung River exceeded the environmental standard value (Yasuda et al., 2012). As many as 441 companies (73,50%) in both DKI Jakarta province and Bogor regency discharge their water waste into Ciliwung River without having a waste water discharge permit.

SECTOR	INTEREST AND OR POLLUTION CONTRIBUTION
Farming; Plantation	Water availability for irrigation and contribute to pesticide, fertiliser, sedimentation. For example, tea plantation using pesticides such as fenvalerate, cypermethrin, and -cyflutrin and its residue in tea leaves was found to exceed maximum residue limits (MRL) (Jayati, et al., 2003).
Tourism	Lead from garbage piling on the river bank due to unavailability of waste management facility and insufficiency of equipment (particularly in Puncak area).
Settlement	Because property along the river bank is easy and cheap to obtain, many people (mostly) from the lower to middle economic classes are attracted to settle there. Having residences (particularly villas) in the upstream area is prestigious. These residences contribute to sedimentation, organic pollution, and incorrect disposal of garbage.

Table 8 • Sectors that contribute to water pollution in the upstream area of Ciliwung River

6.3.2 The need for IWRM and a Negotiated Approach

Ciliwung's deteriorating water quality is caused by many factors. Each sector has a different impact on the water quality. The sectors that have contributed to water pollution in Puncak area (upstream of Ciliwung River).

To improve Ciliwung River water quality, integrating the interests of different stakeholders and including both land and water in the management plans is a must. Both are also the foundation of integrated water resources management (IWRM). The Negotiated Approach (NA) is needed to achieve agreements between all stakeholders to rehabilitate Ciliwung River. A negotiation platform is needed to create a clear sharing of tasks and responsibilities among members/ stakeholders and to build commitment to achieve the common goals. Save Puncak Concortium (SPC) is a negotiated platform consisting of multi-stakeholders to rehabilitate Ciliwung River.

6.3.3 Platform description

Save Puncak Consortium (SPC) was established as a discussion forum for multi-stakeholders to rehabilitate Puncak area, the upstream area for the Ciliwung River, and its tributaries. Its fundamental principles are: i) Protecting the remaining environment, ii) Improving environmental conditions, iii) Improving local community welfare, and iv) Revitalising local community dignity and culture.

Save Puncak Consortium was established through a series of stakeholder meetings, in which academics (P4W-LPPM Bogor Agriculture University), NGOs (Forest Watch Indonesia and Perkumpulan Telapak Western Java Territorial Body), various communities (Ciliwung Institute, Ciliwung Puncak Community, and Komunitas Peduli Ciliwung) participated. Meanwhile, government institutions (particularly local government) such as the governments of North Tugu and South Tugu Villages, Cisarua Sub-district and Bogor District began participating after the establishment of the SPC.

The identified vulnerable groups are local people who are suffering from the environmental degradation in Puncak area, such as tea plantation worker and domestic water users.

The work began with identifying problems, developing plans (including sharing tasks and responsibilities) and then implementing plans independently by each member. Agreements made during the meetings included: i) in-depth and comprehensive understanding of factual conditions is achieved through an action research process; ii) joint activities are based on findings from the action research; iii) target location for the conservation activities is Tugu Selatan and Tugu Utara villages; iv) the foundation of this programme is community participation.

The Save Puncak Consortium (SPC) is involved with the internalisation of the team for Integrated Ciliwung

Watershed Management Planning (ICWMP), which was established by the Ministry of Environment and Forestry. The main task of this team is awareness raising about ICWMP and inviting other institutions or local government members/ departments to implement the plans. The national government (General Secretary of Watershed Control and Forest Reserve) will be covering the operational costs of the team.

6.3.4 Evaluation and lessons learnt

An assessment of the Save Puncak Consortium (SPC) revealed:

a. Save Puncak Consortium (SPC) is a successful model for active participation of community members, building IWRM planning and implementation on community interests and expertise.
b. Developing and managing incentives between upstream and downstream communities is important to maintain the relationship and to ensure sustainability.
c. Jakarta provincial government needs to allocate an annual budget to support conservation activities in the Ciliwung watershed.

Lesson learned from the process are:

a. Diverse competence of members strengthens the platform
b. Importance to start with research, preferably action research
c. Importance of awareness building with public sector and the government
d. Importance of encouraging and helping people and communities to implement their plans
e. Importance of creating and managing cooperation
f. Planning and implementation should properly account for upstream – downstream relation impact

Styrofoam in Ciliwung River, Bogor regency, West Java

Tabel 9 • IWRM institutions involved in the negotiation platforms of the case studies

INSTITUTION	INTEGRATED KAMPAR BASIN INITIATIVE	SRFSA COOPERATIVE	SAVE PUNCAK CONSORTIUM
Provincial and / Regency			
River Basin Territories Organisation (BBWS)	■	■	
Natural resources bureau (Biro SDA)		■	
River Basin Management Bureau (BPDAS)	■		
Regional Development Plan Agency (Bappeda)	■		■
Environmental Protection Agency (BLH)	■		
Public Work Agency (Dinas PU)	■	■	
PerumJasaTirta		■	
Forestry agency	■		
Marine and fisheries agency (DKPi)	■	■	
Industrial and Trading Agency	■		
Meteorology, Climatology, and Geophysical Bureau (BMKG)	■		
University	■	■	■
Indigenous community group	■		
Private, Government owned drinking water company (PDAM)	■	■	
Industry	■	■	
Cleaning and Gardening Agency (DKP)		■	
Village government/community	■	■	■
Local NGO	■	■	■
BKPP			■
Perhutani			■
PTPN			■

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