

POLICY BRIEF

No. 7, 2016

Sustainable Urban Water Environments in Southeast Asia: Addressing the Pollution of Urban Waterbodies in Indonesia, the Philippines, and Viet Nam

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Highlights

Water resources in Southeast Asia are under intense pressure because of population growth, urbanisation and climate change. Rapid economic development and urbanisation have resulted in degradation and depletion of natural resources, including water and related ecosystem services. Many urban rivers in the region are highly polluted with domestic, industrial and agricultural waste. To tackle this issue and to foster an effective approach for sustainable urban development, policymakers in collaboration with the private sector and the international donor community must:

- adopt an integrated approach for protecting urban waterbodies, including by developing relevant legal frameworks and enforcement mechanisms
- initiate comprehensive studies on valuation of water-related benefits. The monetary value of water quality improvements is a useful variable in cost-benefit analyses of water quality-related policies, in both the public and private sectors
- promote public awareness campaigns, education, and transparency through public outreach and education programmes

Urban Water Environments in Southeast Asia

Southeast Asia is rich in water resources, being home to 27% of the world's freshwater resources (FAO 2003). However, low-income and lower-middle income countries of Southeast Asia, as classified by UN DESA (2015), face a particular lack of adequate wastewater treatment systems and have poorly built and maintained septic tanks that result in untreated and disease-inducing wastewater being released into open urban waterbodies. The region is currently affected by clean water scarcity, as an estimated 90% of all wastewater is discharged untreated directly into rivers, lakes or oceans (UN Water 2008). According to the World Bank, in recent decades the annual GDP growth rate has been 5% for Indonesia and the Philippines, and 7% for Viet Nam (World Bank 2016). Rapid industrial expansion and economic development have resulted in unfavourable hydrological, ecological and environmental changes in many river systems. Rapid industrialisation and urbanisation have not been followed by development of solid waste and wastewater treatment infrastructure. In addition to the contamination of waterbodies through toxic industrial chemicals, the lack of household sewerage systems has also contributed to the low quality of water in many parts of Southeast Asia. Across the region, household waste, mining effluents, and industrial and agricultural waste are routinely dumped into waterbodies and pollute aquatic habitats.

Increasing urban populations are amplifying the problem, forcing governments to seek innovative ways to effectively manage the ever-increasing sources of wastewater.

This brief will focus on three lower-middle income countries in the region — Indonesia, the Philippines, and Viet Nam — to outline the current state of urban waterbodies in these countries and provide policy recommendations for addressing issues related to water pollution. It is aimed at policymakers and experts interested in formulating or influencing policies on urban water environments.

Causes and Challenges of Water Pollution in Southeast Asian Cities

The degraded water quality in Metro Manila, Jakarta, and Hanoi that directly affects human security and well-being is primarily due to sociopolitical conditions such as poverty, inequality, and unemployment, among others. The main causes of water pollution in urban waterbodies in the region are (i) the lack of wastewater treatment facilities and solid waste management infrastructure, as well as the insufficient coverage of sewerage systems (with connection rates of only 2% in Indonesia and 10% in Viet Nam [WB 2015]); and (ii) the lack of environmental awareness among urban communities, which leads to disposal of domestic and industrial liquid and solid waste directly into urban waterbodies. Water pollution has health impacts on urban residents, especially children; typhoid, dengue, leptospirosis, and diarrhea are common waterborne diseases prevalent in the region (WHO 2016).

The Philippines

Pollution levels in Metro Manila's rivers are so high that they could be considered open sewers. The main cause is the untreated residential waste that flows directly into the waterbodies. According to official statistics, only 20–30% of the city's households are connected to a sewerage system. The remaining 70% of households have septic tanks, which in many cases leak human waste into underground aquifers. The situation is aggravated by a lack of awareness among residents of informal settlements located on the banks of the city's rivers who throw their trash or defecate directly into these urban waterbodies (Rappler 2014).

Indonesia

Jakarta produces 6,000 tons of waste every day, only 50% of which is properly treated. A 2008 water quality survey conducted by the Ministry of Environment and Forestry (MOEF) of Indonesia found that most of the major rivers in the country were heavily polluted (Fulazzaky 2014). The pollution of rivers, streams, and lakes contaminates surface water and also significantly impacts groundwater quality,

which is an important water source for both residential and industrial purposes, thus exposing the population to environment-related diseases.

Viet Nam

Hanoi lacks the capacity to manage an increasing demand for wastewater treatment facilities. Existing wastewater treatment plants in the city can process only 20% of the city's wastewater (Phan et al. 2015). The rest is directly discharged into urban rivers, causing pollution. This directly affects the quality and productivity of ecosystems, species, and crops downstream. Many environmentalists cite the absence of laws to protect water sources from pollution as the main cause of this water pollution (VietNamNet 2015).

Economic Benefits of Good Quality Water

In addition to their direct value as key resources for domestic and industrial consumption, urban waterbodies may yield valuable benefits including health improvements for citizens, watershed protection, recreation and tourism, education, research, and biodiversity, as well as reduced flood impacts, better maintenance of ecological processes, and climatic stability. Some of these benefits have never been realized by local residents or municipal governments — or this is not feasible — due to high pollution rates. Often policymakers underestimate the value of these functions, since they are not traded on markets and do not appear in national income accounts. Underestimation of pollution and over-exploitation of water resources reduce these benefits and adversely impact nearby residents — and in the cases of Indonesia, the Philippines, and Viet Nam, threaten the long-term sustainable management of natural resources. Behind these constraints is a lack of political will from the central governments, which often prioritise short-term economic benefits and focus on costs associated with managing water resources.

Measures for Addressing Urban Water Pollution and Regulatory Challenges

Local governments in Indonesia, the Philippines and Viet Nam have developed water quality improvement targets for addressing water pollution issues. However, there are still significant gaps within the legal frameworks (e.g., regulations and standards). In some cases, these water quality standards differ for lakes and rivers, and favour certain industries. In addition, measures on water quality are constrained by a lack of organisational, technical, and scientific capacity, as well as limited financial resources.

The maintenance of a good quality environment is a neglected aspect of development in low- and lower-middle

income countries, which is affected by severe shortages of financial resources and by being treated as a low priority in their development agendas. These countries have multiple government ministries, organisations, and agencies related to water resources. For example, the MOEF is responsible for improving water quality but lacks both resources and a clear managing role (or authority). Government agencies have different water quality indicators — such as the MOEF and the Ministry of Health, which makes it difficult to understand which target should be focused on by the metro areas. The absence of coordination between key government players in water resources management, such as the MOEF, the Ministry of Public Works and Housing, and the Ministry of Health, exacerbates the problem. The situation is similar in the Philippines and in Viet Nam. Moreover, there is still no clear roadmap or detailed action plan for addressing urban water pollution through an integrated approach. So far, no organisation has taken a strong leadership role on water pollution control programmes. In addition, a significant barrier to water quality improvement in these countries is the lack of an enforcement mechanism to prevent polluters from disposing rubbish into rivers. Successful examples of such institutions include the Israel Water Commission and Singapore's National Water Agency. Both institutions are funded by the state and are superior water authorities that manage water and wastewater collection, treatment, supply, and distribution in an integrated way.

Policy Recommendations

1. Establish National Water Authority to Coordinate Public and Private Stakeholders

An integrated approach to the maintenance of good water quality should be one of the top priorities for any national development agenda. The central government should establish a government authority to coordinate the activities of ministries, agencies, and organisations dealing with water supply, wastewater treatment and management, sewerage control, educational campaigns, and if necessary the relocation of informal settlements, etc. The new water authority (e.g., a Water Council or Water Commission) must have clear legal status and enforcement authority and be provided with adequate financing from central and local governments. Ideally, the focus of the new authority should be on coordination around water issues, bringing together key public and private players including central, provincial, and local actors to tackle urban water problems.

2. Determine the Value of Water Quality Benefits

Economic studies should be undertaken to estimate the value of benefits provided by water resources, such as rivers and lakes. For example, in the cases of Indonesia, the

Philippines, and Viet Nam, by observing that these areas provide significant benefits, the governments will be more willing to take the steps necessary to effectively protect these resources. Policymakers in cities need more localised information, so conducting a study on estimation of water quality benefits from urban waterbodies would help them to make decisions on environmental protection and urban planning. Effectively protecting water resources will require designing and implementing science-based management, such as water quality simulation and management programmes that address the needs of city residents.

3. Unify Water Quality Standards

Water quality standards should be unified for lakes, rivers, and other surface waterbodies; similarly, wastewater standards for industry should also be consolidated. Current surface water quality monitoring programmes should be expanded and enhanced to allow for the collection and management of more comprehensive data, including by identifying long-term trends and potential threats to city waterbodies. Ideally, authorities will develop precise and detailed maps showing the spatial distribution of water quality conditions for surface waterbodies, in order to identify priority locations for water quality improvements. This could help authorities to achieve SDG 6 "Clean water and sanitation" and SDG 11 "Sustainable cities and communities" through systematic efforts to improve performance in the water sector and by interventions which treat the roots rather than the symptoms of the problem.

4. Incorporate Water Quality Programmes into City Master Plans

Both the general public and authorities have yet to realise the importance of urban water quality, not only for public health but also for economies. Comprehensive plans for improving the quality of surface waterbodies are needed in many Southeast Asian cities. In addition to country-wide water quality programmes, city authorities in developing Southeast Asian countries need to develop plans that clearly identify targets, locations, and deadlines. Without such urban-level plans it is difficult to achieve specified targets for water quality improvement. Such plans must be added to current or in-development city master plans. Many cities in the US, such as Los Angeles, New Orleans, and Omaha have incorporated green infrastructure and health and human services into their city development plans.

5. Utilise Foreign Aid for Capacity-Building

A lack of funding and skilled personnel severely constrains current protection efforts; additional resources are required to facilitate current water quality data management and reporting needs. To achieve this, local governments should

enhance their capacity through training and improving scientific and technical expertise. Foreign governments, international donors, and non-governmental organisations should play a significant role in promoting capacity development for local government agencies dealing with water quality issues. Foreign development assistance is a catalyst for change in the developing world and should support the efforts by these countries to adopt better standards in water quality management through capacity building and knowledge and technology transfer. The governments of the recipient countries bear the primary responsibility for their economic development and must be fairly credited when they succeed. However, by channelling foreign aid to successful projects, the donor community can also play an important role in improving living standards in developing countries.

6: Raise Awareness, Especially among Young People

The preceding recommendations will not solve the existing problems without an increase in environmental awareness at the community level — people need to understand the environmental problems surrounding them, particularly regarding water pollution, and actively participate in solving these problems, starting in their own communities. Young generations should be engaged as agents for change — local education authorities in each country should introduce school curriculums focusing on health, hygiene, and environmental resources. This may be a slow process, but if older generations do not take the initiative by teaching the importance of protecting natural resources, school systems should make this a priority.

Conclusion

Southeast Asia faces serious urban water quality problems, and management and regulatory challenges, as evident in Indonesia, the Philippines, and Viet Nam. Revising and expanding current water programmes and targets,

strengthening the capacity of relevant agencies, and increasing funding and environmental awareness can improve water quality and maintenance, human security and wellbeing in the urban environments of Manila, Jakarta, and Hanoi, and potentially in other countries in Southeast Asia.

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UNU-IAS Policy Brief — No. 7, 2016

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ISSN: 2409-3017

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Publisher
United Nations University Institute for the Advanced Study of Sustainability (UNU-IAS)
Tokyo, Japan



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