

# Sustainable River Basin Management in Asia-Pacific

Prospects for EU-Asia Cooperation

NFG Policy Paper No. 5/2014 Robert Brears



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# Sustainable River Basin Management in Asia-Pacific: Prospects for EU-Asia Cooperation

Robert Brears

## Executive Summary

With three-quarters of Asia-Pacific countries currently facing water scarcity and the vast majority of the region's river basins categorised as transboundary, water managers in the region need to manage water resources in a cooperative manner that promotes sustainable development. Numerous macro trends in the region make this challenging: rapid urbanisation and economic growth, and increased demand for energy and food along with the impacts of climate change. In Europe, the Danube River Basin also faces challenges to water quality and quantity. As Europe has developed a strategy to increase the river basin's water quality and quantity, best practices and lessons learned regarding integrated water resources management in the Danube River Basin can be transferred to the Asia-Pacific region.

## Policy Recommendations

- River basin managers in Asia-Pacific should use Integrated Water Resources Management (IWRM) instruments to manage river basin water in a sustainable way that improves the quality and quantity of water for both humans and nature, and promotes cooperation between all users of transboundary waters.
- European best practices and lessons learned from the application of IWRM could be transferred from Europe to Asia-Pacific. The main platform for cooperation is the European Commission's Flagship Initiative for achieving a resource-efficient Europe. In addition to calling for the sustainable use of water, the Flagship Initiative promotes international cooperation on resource efficiency.
- Two European institutions and platforms could be used to exchange best practices and lessons learned on IWRM: the European Union Water Initiative and Horizon 2020's European Innovation Partnership on Water. This transfer can occur through two main existing regional cooperation frameworks that link Europe with Asia-Pacific: the EU-ASEAN Partnership and ASEM. However, with European river basins facing water quality and quantity issues, best practices and lessons learned on IWRM can also be transferred from Asia-Pacific to Europe.

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# Sustainable River Basin Management in Asia-Pacific: Prospects for EU-Asia Cooperation

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## 1. Introduction

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In 2030, global demand for water is predicted to outstrip supply by 40%. With three out of four Asia-Pacific countries currently facing water scarcity and the vast majority of the region's river basins categorised as transboundary (crossing both inter-state and intra-state administrative and political boundaries), water managers in the region need to manage water resources in a cooperative manner that promotes sustainable development.

Sustainability in water resources management recognises (i) that water provides vital ecosystem services necessary for the survival and health of both humans and nature, (ii) that it should be allocated to the most beneficial uses in society through economic pricing, and (iii) that the use of water should not exceed the limits of its natural recharge rate which can be achieved through the promotion of water conservation (Bithas, 2008, Corfee-Morlot et al., 2009, Smith et al., 2006, UN-Water, 2013, Jønch-Clausen and Fugl, 2001, OECD, 2010). Nonetheless, achieving sustainable water resources management in Asia-Pacific is challenged by numerous macro drivers in the region. These include rapid urbanisation and economic growth, increased demand for energy and food, and climate change, all of which impact water quality and quantity in various ways.

Failure to manage transboundary river basins in a cooperative and sustainable manner may lead to numerous impacts on Asia-Pacific. These include: impacts on governance (stagnation in economic growth, political unrest, reduced agricultural yields, increased social costs of unemployment and security risks/conflict over natural resources); impacts on society (increased environmental degradation, water shortages, social unrest, migration pressures, loss of livelihoods); and impacts on business (export constraints, increased resource prices, volatility of commodity prices, water restrictions, lost investment opportunities) (United Nations ESCAP, 2013).

In short, there are many reasons to promote sustainable water use in the Asia-Pacific region. This policy paper explores how river basins in Asia-Pacific can be managed in a cooperative, sustainable way. It also looks at how best practices and lessons learned on river basin management in Europe can be transferred to the Asia-Pacific region through numerous platforms for cooperation.

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## 2. Challenges to Sustainable River Basin Management in Asia-Pacific

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In the Asia-Pacific region, the macro challenges of managing river basins in a sustainable way include:

**Rapid urbanisation:** The Asia-Pacific region is one of the most rapidly urbanising regions in the world, with urban populations growing at 2.3% per annum compared to the global average of 2%. Currently, there are 10 mega-cities in the region (cities with 10 million or more residents). This will increase to 15 by 2025, leading to significant increased demand for water resources. In addition, water quality is threatened by land-use changes that degrade ecosystems, point source pollution from industrial and domestic waste, and non-point source pollution from organic and inorganic chemicals.

**Rapid economic growth:** The region's rapid economic growth will see a significant increase in the percentage of water resources used by industry: In low-to-middle income countries, industry typically accounts for around 10% of total water withdrawals; however, this rises to nearly 60% for high-income countries.

**Increased energy demand:** Electricity production in Asia-Pacific grew by an average of 6.1% per annum from 2000 to 2008. Meanwhile, energy consumption in Asia-Pacific is projected to grow at 2.3% per annum, outstripping other regions of the world. China and India are projected to become the largest energy consumers globally by 2035. These trends will result in increased demand for water in the production of electricity.

**Increased food demand:** With the total population of the region increasing by an additional 1.5 billion people, by 2050, food production is set to increase. Currently, agricultural production accounts for 79% of water withdrawals, but this is expected to increase by 75-100% over the next half-century.

**Climate change:** The Asia-Pacific region suffers disproportionately from natural disasters: 90% of all people affected by natural disasters between 2001 and 2010 reside in the Asia-Pacific region. Climate change will likely increase the frequency and magnitude of floods and droughts. Specifically, flooding will decrease the availability of good quality water from the contamination of surface and ground water supplies, while droughts decrease the quantity of water available while increasing demand for water for cooling and drinking.

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### 3. The Integrated Water Resources Management Framework for Sustainable River Basin Management

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Integrated Water Resources Management (IWRM) is a cross-sectoral approach designed to promote the coordinated development and management of water, land and related resources. It seeks to maximise economic and social welfare in an equitable manner without compromising the sustainability of ecosystems and the environment (Global Water Partnership, 2011). IWRM, therefore, is based on the understanding that water resources are an integral component of the ecosystem, a natural resource and a social and economic good.

Successful IWRM requires the coordinated development and management of land and water use, surface water and groundwater, water quantity and quality, upstream and downstream use, and freshwater and coastal waters, while recognising that all users are dependent on one another. There are numerous examples of how users of water can affect one another. For example, high irrigation demands and polluted waterways from agriculture result in less fresh water for drinking and industrial use. Contaminated municipal and industrial wastewater pollutes rivers and threatens ecosystems. Excess water left in rivers means less water is diverted for crop growth.

An important aspect of IWRM is the participation of individuals and communities in all aspects of water management policy and decision making. This ensures that all members of society benefit from the sustainable and equitable use of water resources. IWRM also involves modifying human systems to encourage people to use water resources sustainably. This is achieved using a variety of management instruments:

**Water resources assessments:** These assessments are required for informed decision making and involve the collection of hydrological, demographic and socio-economic data and the setting up of routine data assembly and reporting. Water resources assessments are also important for mitigating floods and droughts. Assessments can be used for planning development options, resource use and human interactions.

**Demand management:** This concept involves using water more efficiently. It requires balancing supply and demand and focuses on the better use of existing supplies or reducing excessive consumption, rather than developing new supplies. Social change instruments including public awareness campaigns encourage a water-orientated society.

**Conflict resolution mechanisms:** These are vital, as conflict is endemic in the management of water resources in many places. Therefore, dispute resolution tools must be in place for users. Regulator instruments are frequently used in the management of water and involve setting allocation and water-use limits.

**Regulation:** In terms of water resources management, regulations usually cover pollution control, service provision and land use. Regulatory instruments are frequently combined with economic instruments such as pricing, subsidies and other market tools to provide incentives for all water users to conserve water and use it efficiently and avoid pollution.

**Technology:** This involves increasing through research and development the technological efficiency of the water supply infrastructure in addition to the creation of efficiency guidelines for water use by both domestic and non-domestic users (household, agricultural, industrial etc.).

**Finance:** In IWRM, this involves investment in implementing IWRM by users, governments, the private sector and donors.

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## 4. The EU's Response to Water Management Challenges in the Danube River Basin

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The Danube River flows through Europe for over 2,800km. The river and its tributaries form the world's most international river basin, linking 19 European Union (EU) and non-EU states. The main uses of the Danube River Basin's water resources are water abstraction (industry, irrigation, household supply), drinking water supply, wastewater discharge (municipalities, industry), hydropower generation, navigation, dredging and gravel exploitation, recreation, and various ecosystem services.

Sustainable water resources management is a critical issue to the Danube Region, especially since the water crosses numerous political and administrative boundaries, requiring strong coordination and cooperation across countries and across sectors. Such coordination is already facilitated through the International Commission for the Protection of the Danube River (ICPDR), which is the Steering Body of the Danube River Protection Convention, established in 1998 and supported by a Secretariat.

In 2000, the EU's Water Framework Directive (WFD) established a legal basis to protect and restore clean water across Europe and ensure its long-term, sustainable use. The WFD called for all Member States to establish River Basin Management Plans (RBMPs) by 2009 with the aim of achieving good status in river basins by 2015, or by 2027 at the latest.

In response to the WFD, the ICPDR published in 2009 the Danube RBMP which outlined four main challenges to achieving good status for both surface and groundwater across the Danube Basin: (i) Organic pollution from partially treated or untreated wastewater from urban areas, industry or agriculture, (ii) nutrient pollution from insufficiently or untreated urban wastewater into surface water, industrial chemical production and fertiliser used in agricultural production, (iii) hazardous substance

pollution from storm water overflows, pesticides and discharges from industrial production and accidental pollution, and (iv) Hydromorphological alterations to rivers and lakes from hydropower generation, flood protection and water abstraction. The EU Strategy for the Danube Region seeks to strengthen general awareness and facilitate the exchange of best practices in integrated water resources management among the population and the decision makers in the region. It promotes measures aimed at reducing knowledge deficits, and developing and transferring tools, methods and guidelines concerning the safeguarding of drinking water supply.

In recognition of the various challenges to water quality and quantity identified in the Danube RBMP, the Strategy calls for future actions to achieve good status for the Basin including: Reducing organic and nutrient pollution, fostering intersectoral dialogue, implementing technology to mitigate hazardous contamination, and ensuring adequate quantities of water are maintained for healthy ecosystems.

Under the Europe 2020 Strategy of achieving smart, sustainable and inclusive growth, the European Commission's Flagship Initiative of achieving a resource-efficient Europe aims to create a framework for policies that support Europe's shift towards a resource-efficient and low-carbon economy. This seeks to help Europe fight climate change and limit the environmental impacts of resource use. Regarding water, the Flagship Initiative calls for a water policy that ensures water is available in sufficient quantities, of appropriate quality, is used sustainably and with minimum resource input, and is ultimately returned to the environment with acceptable quality.

There are, however, significant challenges to managing river basins sustainably in Europe to achieve good status: Only 30% of surface water and 25% of groundwater is not at serious risk from pollution, 60% of Europe's cities over-exploit their groundwater resources, 50% of wetlands are endangered due to over-exploitation of groundwater, while the area of irrigated land in Southern Europe has increased by 20% since 1985 (European Commission, 2010).

With river basins in Europe required to reach good status by 2015, or 2027 at the latest, the EU can transfer to the Asia-Pacific region the best practices and lessons learned regarding the use of various IWRM management instruments to improve the quality and quantity of surface and groundwater in the Danube as well as other European river basins.

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## 5. Promoting Collaboration between the EU and Asia-Pacific

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The Europe 2020 Flagship Initiative identifies cooperation with key partners to address resource-efficiency issues internationally as a key priority. This builds on growing international awareness of the strategic importance of avoiding risks to the supply of resources, including water. The Strategy highlights how concerted action at the global level can help mitigate the rise in global demand for resources, and calls for international cooperation to promote the exchange of skills, technology and best practices.

As part of this Flagship Initiative, the EU can transfer to the Asia-Pacific region its best practices and lessons learned regarding the implementation of IWRM instruments used to achieve good status in Europe's river basins in general and the Danube in particular. There are two principal existing institutional frameworks for cooperation between the regions that could provide the basis for deepening cooperation: the EU-ASEAN Partnership and the Asia-Europe Meeting (ASEM) forum.

**EU-ASEAN Partnership:** The Bandar Seri Begawan Plan for Action to Strengthen the ASEAN-EU Enhanced Partnership (2013-2017) serves as a vehicle to strengthen the ASEAN-EU Partnership on addressing regional and global challenges of shared concern. The Plan of Action calls for promoting public awareness and partnership to enhance integrated water resources management. It also calls for bolstering sub-regional cooperation in the Lower-Mekong region and drawing out experiences from the EU's Strategy for the Danube Region. In addition, the Plan of Action also calls for increased public awareness of inland waters and the need to address food security and maintain ecosystem services.

**ASEM:** Managing the world's resources was identified as a key priority by ASEM partners, because good water governance reduces poverty and increases standards of living. Regarding river basin management, ASEM established the Danube-Mekong Cooperation Initiative. This decision is underpinned by the belief that cooperation on water resources management can help overcome cultural, political and social tensions and builds trust and social peace between states. In addition, cooperation is essential to ensure a more efficient and sustainable use of water resources through joint management plans.

This transfer of best practices and lessons learned in IWRM from Europe to Asia-Pacific can occur through the European Union Water Initiative and Horizon 2020.

**European Union Water Initiative:** The European Union Water Initiative (EUWI) was launched in 2002 as a partnership between national governments, donors, the water industry, NGOs and other stakeholders. The EUWI was launched to share EU experience of river basin management, promote transboundary cooperation in the implementation of IWRM, and provide a platform for developing regional and sub-regional cooperation to enhance peace and security. The main instrument used by the EUWI to promote IWRM is National Policy Dialogues. These support water sec-

tor reforms through assistance in development and implementing water strategies and legislation based on IWRM, strengthening intersectoral cooperation to improve water and health, and development of national policies for the management of transboundary waters.

**Horizon 2020's European Innovative Partnership on Water:** Horizon 2020 is the largest EU Research and Innovation programme in Europe's history, with nearly 80 billion Euros of funding available over seven years (2014-2020). The programme aims to promote excellence in science, industrial leadership and tackling societal challenges faced by citizens in Europe and elsewhere. Horizon 2020's European Innovative Partnership (EIP) on water facilitates the development of innovative solutions to address major European and global water challenges. In particular, the EIP on water aims to initiate and promote collaborative processes for change and innovation in the water sector across the public and private sectors, non-governmental organisations and the general public. Horizon 2020 states that the EU should promote its experience in water policy and river management.

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## 6. Conclusion

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Three-quarters of countries in the Asia-Pacific region currently face water scarcity. With numerous macro trends in the region affecting water quality and quantity, and the vast majority of the region's river basins categorised as transboundary, policy makers need to manage water in a sustainable and cooperative manner.

The EU's Strategy for the Danube region calls for IWRM actions to restore and maintain the quality and quantity of the Danube River Basin's waters. Europe's best practices and lessons learned in IWRM can be transferred to Asia-Pacific. The European Commission's Flagship Initiative for a resource-efficient Europe provides a platform for cooperation. In addition to calling for the sustainable use of water in particular, the Flagship Initiative promotes international cooperation on resource efficiency. In this context, policymakers in the EU and Asia-Pacific countries should take the following steps to promote IWRM:

- River basin managers in Asia-Pacific should use IWRM instruments to manage river basin water in a sustainable way that improves the quality and quantity of water for both humans and nature, and promotes cooperation between all users of transboundary waters.
- European best practices and lessons learned from the application of IWRM could be transferred from Europe to Asia-Pacific. The main platform for cooperation is the European Commission's Flagship Initiative for achieving a resource-efficient Europe. In addition to calling for the sustainable use of water, the Flagship Initiative promotes international cooperation on resource efficiency.

- Two European institutions and platforms could be used to exchange best practices and lessons learned in IWRM: the European Union Water Initiative and Horizon 2020's European Innovation Partnership on Water. This transfer can occur through two main existing regional cooperation frameworks that link Europe with Asia-Pacific: the EU-ASEAN Partnership and ASEM. However, with European river basins facing water quality and quantity issues, best practices and lessons learned in IWRM can also be transferred from Asia-Pacific to Europe.

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