EU-INDIA WATER PARTNERSHIP

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TABLE OF CONTENTS

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Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation

Foreword

The European Union and its Member States have a comprehensive partnership with India going back more than fifty years. There is no sector of the economy and no aspect of society which has not been enriched by our exchanges. The EU and India collaborate closely on achieving the Sustainable Development Goals and in fighting climate change.

This strategic collaboration is set to gain further momentum under the newly launched European Green Deal – a roadmap for making the EU's economy sustainable by turning climate and environmental challenges into opportunities for growth and innovation, across all policy areas.

In this framework, water is one of the fundamental elements for the sustainable modernisation of our societies. Water is life, water has a strong cultural and social meaning. Almost every economic sector depends on water.

A Memorandum of Understanding between the Republic of India and the European Union on an India-EU Water Partnership (IEWP) was signed in 2016, with the objective to strengthen the technological, scientific and management capabilities of India and the EU in the field of water management.

During the past five decades in the EU, we have improved our legislation and the governance models of water. We have implemented thousands of measures to prevent pollution, treat urban and industrial wastewater adequately, improve water use efficiency and minimise the impact of floods and droughts.

Of course, there are still many areas where we have to make advances. In this perspective, we are keen to share lessons learned, new approaches and technologies with India. Many of the water management challenges that we face are similar, irrespective of geographic differences.

The Action Plan developed jointly under the India-EU Water Partnership has focused on some of the aspects of major concern for India's water future, and good progress is being made.

We look forward to further intensifying actions under this Partnership. The resilience of global ecological systems is more fragile than we expected and changes in water management and people's behaviour often require time. It is crucial that we act consistently and cohesively at a global level. I am looking forward to the results on the ground of this Partnership.

Ugo Astuto

Ambassador of the European Union to India

The European Union Key Facts*

Population (2019): 446 million

Population density (2017): 108 persons/km²

Land area (2016): 4 million km²

GDP (2018): €13.48 trillion

GDP per capita (2018): €30,160

The European flag features a circle of 12 gold stars on a blue background. They stand for the ideals of unity, solidarity and harmony among the peoples of Europe. The European flag symbolises both the European Union and, more broadly, the identity and unity of Europe.

- The European Union (EU) is an economic and political union of 27 EU countries;
- The EU has developed an internal single market through a standardised system of laws that apply in all Member States. EU policies aim to ensure the free movement of people, goods, services, and capital within the internal market;
- The Member States delegate sovereignty to the EU institutions to represent the interests of the European Union as a whole. There are common policies for trade, agriculture, energy, environment, fisheries, competition, research, external relations and regional development;
- The EU's main bodies are: the European Parliament, the Council of the European Union, the European Commission, and the European Court of Justice;
- The guiding values of the EU include human dignity, freedom, democracy, equality, rule of law, and human rights;
- The EU has delivered more than half a century of peace, stability and prosperity, helped raise living standards and launched a single European currency: the euro. More than 340 million EU citizens in 19 countries now use it as their currency and enjoy its benefits;
- The EU is the largest trade bloc in the world, and the biggest exporter of manufactured goods and services and the biggest import market for over 100 countries;
- The EU has a diverse and rich culture, with 24 official languages and over 60 indigenous regional or minority languages;
- Collectively, the EU and its constituent countries is the world's leading donor of humanitarian aid;
- In 2012, the EU was awarded the Nobel Peace Prize for advancing the causes of peace, reconciliation, democracy and human rights in Europe;
- The motto of the EU is "united in diversity" which first came into use in 2000.

*As per latest figures from Eurostat for EU27

Key Dates

1950
On 9th May 1950, French Foreign Minister Robert Schuman gave a speech which publicly proposed the establishment of a European Coal and Steel Community (ECSC).

1951
The ECSC is founded by six countries (Belgium, the Federal Republic of Germany, France, Italy, Luxembourg and the Netherlands).

1957
The six countries set up the European Economic Community (EEC), for wider cooperation. One of its core objectives is to develop a common market offering free movement of goods, services, capital and people. Border checks and customs duties would be gradually removed.

1969
At the Hague Summit, the EEC's political leaders decide to move further ahead with European integration.

1973
Denmark, Ireland and the United Kingdom join the European Communities, bringing their membership to nine.

1986
Spain and Portugal join the European Communities, bringing their membership to 12.

1991
The Maastricht European Council adopts a Treaty on European Union. It lays the basis for a common foreign and security policy, closer cooperation on justice and home affairs and the creation of an economic and monetary union, including a single currency. The inter-governmental cooperation in these fields added to the existing Community system creates the European Union (EU). The EEC is renamed the 'European Community' (EC).

1992
The Treaty on European Union is signed at Maastricht. It enters into force on 1 November 1993.

1993
The Single Market is created.

1995
Austria, Finland and Sweden join the EU, bringing its membership to 15.

1999
The currencies of 11 EU countries are replaced by the euro. The single currency is launched on the money markets. From this point onwards, the European Central Bank (ECB) has responsibility for the EU's monetary policy, which is defined and implemented in euro.

2002
People in the euro area countries begin using euro notes and coins.

2004
Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia join the European Union.

2007
Bulgaria and Romania join the EU.

2013
Croatia joins the European Union as its 28th member state.

2020
The United Kingdom withdraws from the European Union.

Elements for an EU Strategy on India

The European Union and India upgraded their long-standing relationship to a strategic partnership in 2004, acknowledging their common goals and principles. Nowadays, in a challenging international environment, the EU and India share the same values of democracy, human rights, fundamental freedom and support the rule-based global order.

Pursuant to this, in November 2018, the European Commission and the High Representative of the Union for Foreign Affairs and Security Policy adopted a Joint Communication that sets out the EU's vision for a strategy to strengthen cooperation and the partnership with India. Through the strategy, the EU places an emphasis on reinforcing cooperation in foreign policy and developing security and defence cooperation with India, promoting effective multilateralism, and building on common values and objectives.

This Joint Communication replaces the last Commission Communication on India of 2004, recognising that India has emerged as the fastest-growing large economy and has acquired an important geopolitical role.

> **The Strategy aims to strengthen the EU-India Strategic Partnership by focusing on sustainable modernisation and on common responses to global and regional issues, and will provide the policy framework for the EU's deeper and broader engagement with India over the coming years.**

EU-India: Partners in Progress

MODERNISATION

+ Investment in India's sustainable modernisation
+ New business opportunities
+ Enhanced connectivity and data protection
+ Sustainable urbanisation

ENVIRONMENT, ENERGY AND CLIMATE CHANGE

+ Implementation of the Paris Agreement
+ Clean energy transition, energy efficiency and renewable energy
+ Addressing major environmental challenges
+ India-EU Water Partnership
+ Joint Declaration on Resource Efficiency

TRADE & INVESTMENT

+ Balanced, ambitious and mutually beneficial agreements on trade and investment
+ Sound, transparent, non-discriminatory regulatory and business environment in India

INNOVATION

+ More people-to-people exchanges, utilising societal diversity
+ Cooperation on education and skills, mutual recognition of qualifications, mobility of talent
+ Innovation initiatives

Strengthening the Political Partnership

REINFORCING COOPERATION ON FOREIGN POLICY

+ Coordinating on the most relevant foreign policy issues
+ Working for stability and security in the overlapping neighbourhoods
+ Engaging India more on sustainable connectivity both at strategic and operational levels
+ Sustainable urbanisation

DEVELOPING SECURITY AND DEFENCE COOPERATION

+ Fighting terrorism and radicalisation
+ Exchanging expertise on maritime and cyber security, non-proliferation / disarmament and hybrid threats
+ Military relations via personnel exchanges and trainings

PROMOTING EFFECTIVE MULTILATERALISM

+ Promoting the rules-based global order and trading system
+ Improving coordination in the United Nations, World Trade Organisation and G20
+ Working on strong, sustainable, balanced and inclusive global growth

BUILDING ON COMMON VALUES AND OBJECTIVES

+ Promoting gender equality and women's empowerment, human rights and democracy, and the inclusion of young people
+ Coordinating on humanitarian and disaster relief operations
+ Delivering the UN Sustainable Development Goals and Agenda 2030

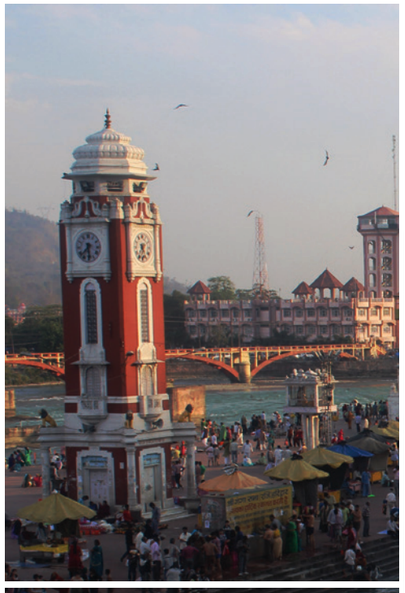
1.
The EU is India's first trading partner with trade in goods and services crossing €125 billion

2.
6,000 EU companies established in India employing (direct and indirect) 6 million people

3.
The European Investment Bank (EIB) has invested €2.5 billion in infrastructure, renewable energy and climate projects

4.
There are currently around 50,000 Indian students studying in Europe

Building Bridges for European Solutions to Jointly Manage India's Water Challenges



Traditionally perceived as an abundant natural resource, water is increasingly becoming scarce, posing a major challenge to society and the economy. India has more than 18% of the world's population, but has only 4% of the world's renewable water resources, which are intensively used for drinking, producing food, energy and other goods. At the same time, India's rivers and wetlands are part of the country's much-valued cultural, religious and natural heritage. As in many other regions of the world, the pressures of water consumption and water pollution from economic sectors have led India to increasingly place water security at the forefront of its development agenda by promoting an integrated water resources management approach. Some of the priority actions that the Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation (MoJS, Dpt. WR, RD & GR) and the Government of India have been focusing on include pollution abatement, determination of environmental flows, floodplain protection, aquifer mapping, groundwater regulation and recharge, irrigation use efficiency and international cooperation.

The EU-India Strategic Partnership, in place since 2005, recognises the interdependencies in the field of the environment of India and the EU and the trans-boundary character of many environmental problems. It provides a platform to India and the EU to identify key environmental issues and approaches to sustainable development where the exchange of experiences and cooperation could be mutually beneficial.

The first Indo-European Water Forum, held in New Delhi on 23-24 November 2015, provided the impetus for setting up an Indo-European Water Partnership. Since then, counterparts in India and the EU have developed their shared vision for more sustainable management of water resources and started to tackle the challenges posed by water management in the context of a growing population, competing for water demands, groundwater over-exploitation, maintenance of environmental flows and a changing climate.

The actions of the Partnership are a valuable contribution, not only to improve the water management on site but also to rethink, reassess and reorient water policy in India, as one of the priorities of the MoJS, Dept. WR, RD & GR.

U P Singh
Secretary, Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation, Government of India

The India-EU Water Partnership in a Nutshell

The India-EU Water Partnership (IEWP) is an outcome of the 'Joint Declaration on Water' adopted by India and the EU on 30 March 2016 during the 13th EU-India Summit in Brussels, with the aim to enhance cooperation on water-related issues, including the 'Clean Ganga' programme of the Government of India. At the Summit, Prime Minister Narendra Modi met members of the European Union (EU) represented by the then President of the European Council, Donald Tusk and the then President of the European Commission (EC), Jean-Claude Juncker.

> **Subsequently, a 'Memorandum of Understanding on the India-EU Water Partnership' was signed in October 2016 between the then Indian Minister of Water Resources, River Development and Ganga Rejuvenation (MoWR, RD & GR), Uma Bharati, and EU Environment Commissioner, Karmenu Vella.**

The objective was to strengthen the technological, scientific and management capabilities of India and the EU in the area of water management. This should take place on the basis of equality, reciprocity and mutual benefit. The preparatory action to establish and structure the IEWP started in December 2015 and lasted until May 2017. This phase was dedicated to deliberate and agree on IEWP activities for the cooperation on water resources management between the EU and the then MoWR, RD & GR.

Since July 2017, the IEWP is co-financed for implementation by the European Union (EU) and the German Federal Ministry of Economic Cooperation and Development (BMZ). In this context, the IEWP is implemented and coordinated by GIZ India in conjunction with the BMZ funded Indo-German Technical Cooperation project 'Support to Ganga Rejuvenation'. The MoJS, Dept. WR, RD & GR representing the Government of India (GoI) provides equal support towards achieving the objectives of the IEWP. For its implementation, an IEWP/GIZ Project Management Unit was put in place at the GIZ India office. The IEWP Joint Working Group comprising representatives from the MoJS, Dept. WR, RD & GR and the EU was also established. The Joint Working Group of the IEWP agreed to focus on the implementation of the IEWP Action Plan and its nine priority areas that relate to water resources management as well as River Basin Management.

The overall purpose of the IEWP Action is:

- To facilitate cooperation between India and a flexible coalition of EU Member States on water-related issues of mutual interest by further developing the IEWP; and
- To foster business opportunities for EU companies, which have the technical know-how, to contribute to improving the efficiency, effectiveness and sustainability of water management in India.

Indian Partners

The Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation (MoJS, Dept. WR, RD & GR) is the Indian partner for the India-EU Water Partnership (IEWP). The MoJS, Dept. WR, RD & GR is responsible for formulating policy guidelines and programmes for the development and regulation of the country's water resources. In their endeavours, they are supported by several aligned technical agencies. Key agencies supporting the implementation of the IEWP Action Plan include:

Central Water Commission (CWC), MoJS, Dept. WR, RD & GR

CWC is India's premier technical organization for initiating, coordinating and strengthening - in consultation with the concerned state governments - schemes for control, conservation and utilization of surface water resources for the purpose of flood control, irrigation, navigation, drinking water supply and hydropower development. The CWC and its regional offices in collaboration with European experts support the planning and implementation of IEWP activities. Currently, CWC hosts the Indian Project Management Unit of the IEWP.

Central Ground Water Board (CGWB), MoJS, Dept. WR, RD & GR

CGWB is India's premier scientific organisation for the sustainable development and management of groundwater resources in India. The CGWB and its regional offices, in collaboration with European experts, are important partners for achieving activities agreed under the IEWP on groundwater aspects.

National Mission for Clean Ganga (NMCG), MoJS, Dept. WR, RD & GR

NMCG is an implementation body of the National Ganga Council. Its mandate is to ensure abatement of pollution and rejuvenation of River Ganga by adopting a River Basin Management approach and to maintain minimum environmental flows in the River Ganga with the aim of ensuring good water quality and environmentally sustainable development.

National Water Academy (NWA), MoJS, Dept. WR, RD & GR

The main mandate of NWA is to train in-service engineers of various central/state organizations involved in the development and management of water resources. Thus, NWA is a core partner for planning and organising capacity building measures under the IEWP.

Water Resource Department (WRD) of selected States

WRD of the states of Gujarat, Madhya Pradesh, Maharashtra, Kerala, Odisha, Telangana, Uttarakhand, Bihar, West Bengal, Jharkhand and Uttar Pradesh provide administrative support and technical inputs on various activities under the IEWP and benefit from the work undertaken.

Other National Institutions

Sector-specific national institutions, such as National Hydrology Project (NHP), Central Pollution Control Board (CPCB), Central Inland Fisheries Research Institute (CIFRI), Wildlife Institute of India (WII), National Institute of Hydrology (NIH), Indian Institute of Technology, Kanpur (IITK), State Pollution Control Boards (SPCB), World Wide Fund for Nature India (WWF) and others, are often involved in IEWP activities.

European Partners - EU Member States

The EU Member States (EU MS) are the IEWP's backbone and provide important steering to the partnership. The governance and management challenges of inter-state rivers in India are similar to those being addressed by EU Member States through the EU Water Framework Directive. Not all EU MS are active in India yet. Still, several EU MS have been involved with India through bilateral actions on water, participating in demonstration pilots and mutually gaining significant expertise. Such actions address, for example, river basin management, groundwater management, wastewater management, water-related capacity building and water research and development.

Thus, the EU MS provide top technical expertise, EU technological solutions and active EU businesses in India's water sector. Mutual benefits are achieved through showcasing the EU MS' work in events organized within the cooperation framework of the IEWP. Besides the overall exchange between the IEWP and EU MS, specific Memorandum of Understanding/Joint Expressions of Intents (EoIs) are already in place with Germany, the Netherlands and Hungary and others are aimed for. The examples below outline bilateral activities of EU MS that are active in India and also highlight cooperation activities related to MoU/EoIs with the IEWP.

Germany

Germany strongly supports overall EU initiatives and cooperation with and between EU Member States. To this end, the German Federal Ministry of Economic Cooperation and Development (BMZ) co-finances the India-EU Water Partnership since 2017.

The "Support to Ganga Rejuvenation" project is being implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). Since 2014, the project focuses on supporting the Indian government in implementing integrated River Basin Management approaches and mechanisms, and enhancing the effectiveness of wastewater treatment. In this context, other BMZ projects tackle, for example, water and sanitation. Under financial cooperation, KfW supports infrastructure projects on the Ganga River.

The German Federal Ministry (BMZ) signed a Joint Expression of Interest with the IEWP in February 2019. Germany sees the integration of its own and the other EU Member States' expertise as essential in order to provide meaningful contributions to solving India's key challenges regarding the Ganga and other water issues towards improved River Basin Management.

Netherlands

For a long time, the Kingdom of the Netherlands has developed active water cooperation with India, and signed a Memorandum of Understanding in June 2017, aiming to develop further activities related to river basin and integrated water resource management, pollution abatement, water quality and wastewater management, delta management, applications of remote sensing and geographical information systems in hydrology and water resources, water safety, water recycling and re-use through innovative technologies. In February 2019, the Embassy of the Kingdom of the Netherlands in India and the India-EU Water Partnership signed a Joint Expression of Intent to cooperate by active participation in the steering of the Partnership, overal cooperation and technical contributions.

Hungary
Hungary has in-depth experience in River Basin Management, water and waste water management and water-related education, research and development. As a consequence, the Ministry of Interior of Hungary and the then Ministry of Water Resources, River Development and Ganga Rejuvenation of the Republic of India signed a Memorandum of Understanding for cooperation in October 2016.

This cooperation has been re-enforced by a further Memorandum, signed in February 2019, between the Ministry of Foreign Affairs and Trade of Hungary and the Delegation of the European Union to India and Bhutan, aiming to strengthen technical and business cooperation in several areas included under the India-EU Water Partnership.

These include wastewater treatment with the main focus on decentralised solutions, continuous and real-time monitoring of water quality, big data and artificial intelligence for sensor networks, elimination of plastic pollution in water bodies through technical solutions, capacity building of stakeholders, waste management and recycling/ upcycling initiatives.

Denmark
Denmark is cooperating bilaterally in India under a Memorandum of Understanding on water. The Embassy of Denmark through engaging their technology company SkyTEM Aps and research institution Aarhus University has played a key role in mapping aquifers in six different hydrogeological settings in India. It was accomplished in collaboration with the National Geophysical Research Institute of India and the Central Ground Water Board (CGWB). Denmark expressed interest to get involved in the IEWP, specifically on activities listed under PR1, PR3, PR4, PR7, PR8, and PR9. To formalise the engagement, the IEWP is planning to have an Expression of Intent (EoI) with the Embassy of Denmark.

Belgium
Belgium knows the importance of good water management, water purification and waste water recycling technologies. Water is one of the key priority areas for cooperation with India. Belgium is a partner of the India-EU Water Partnership (IEWP), specifically its priority Areas 3 (River Rejuvenation) and 9 (Research and Innovation). Several Belgian companies are active in India and have good project references related to environmental safeguards (Ecorem), water quality monitoring (Applitek), removal and treatment of river sediments (DEME, Envisan) and wastewater treatment (Waterleau, Aquaplus). The Flemish Institute for Technological Research (VITO) is providing technological expertise on river rejuvenation and coordinates a joint EU-India Horizon2020 research and innovation project on the environmental and economic potential of municipal wastewater treatment, resource recovery and reuse solutions for urban and peri-urban areas in India.

In 2019, the IEWP signed a Memorandum of Understanding (MoU) with the Center for Ganga River Basin Management and Studies (cGanga) and the cGanga Europe Desk in collaboration with VITO to facilitate and channelize innovative and successful European technology, expertise and policies that can contribute to the cleaning, restoration and conservation of the River Ganga.

France
The French Ministry of Ecological and Inclusive Transition has signed MoUs with the Ministry of Forest, Environment and Climate change (2018) and the Ministry of Housing and Urban Affairs (renewed in 2018), leading to the creation of two joint working groups in which water is among the areas of cooperation. The joint working groups meet annually, gathering high-level officials from both countries, as well as experts and the French Agency for Development.

The Embassy of France in association with the National Institute of Advanced Studies in 2013 established the Indo-French Water Network (IFWN) which aims at developing and strengthening partnerships between India and France in the field of water. It is supporting the transfer of initiatives, capacity building and practical solutions, with the national, state and local governments, industries, academia, decision making bodies, NGOs and civil society, and the communities as the stakeholders. In addition, IFWN strives to strengthen and expand the quality and potential of research in both countries by building greater interaction between France and India in the field of water. There is a possibility of finding synergies between the activities of the IFWN and the PR7 (capacity building) and PR9 (innovation, research, technologies).

In India, the French Development Agency (AFD) also works towards the sustainable use of water resources. To meet the ever-increasing demand for water and improve the management of resources, AFD is supporting the city of Jodhpur (2012-2019, €49 million) to optimize its domestic water distribution network with an approach that focuses on energy and water efficiency, and on improving service quantity and quality for residents. AFD is also working with the district of Puducherry (2018-2022, €65 million) to augment the availability of water, rationalize water distribution leveraging smart technologies, and transform district water services into a strong utility. In the future, AFD is looking to support pilot schemes including 24*7 water supply as well as investments to improve sanitation services.

Several French companies specializing in water management, treatment and distribution are also present in India, making, employing and innovating in the country.

Spain
Spain is a very active EU MS regarding water cooperation with India. Spain and India share lot of similarities in terms of agro-climatology and the water scarcity situation, and are joining hands at several instances to work closely and continue striving to make an impact in irrigation, hydrological planning, water scarcity and climate disasters, and river basin management, amongst others.

A Spanish delegation comprising eight companies and centres participated in India Water Week 2017 and also had discussions with Indian counterparts to identify areas of mutual interest, laying the basis for future collaborations in water technologies. More recently, under the EU Programme Horizon 2020, 10 research entities from Spain partnered in EU consortia with India in five projects under the Flagship EU-India Call in Water, for co-development and demonstration of water management, treatment and resource recovery technologies for the Indian context. Official and experts field visits were promoted, to exchange experience and knowledge on water resources.

Sweden
The Stockholm International Water Institute (SIWI) works in India with local partners in the water and textile industries in the Sweden Textile Water Initiative, an award-winning sustainable production capacity building program in India since 2013. Currently SIWI builds up a program on Reducing Emissions from Antibiotics Production (REAP), promoting sustainable antibiotics production and supporting collaboration between Indian suppliers, and Indian and international procurers and regulators.

Other IEWP Partners and Active Actors

cGanga

The Centre for Ganga River Basin Management and Studies (cGanga) is a comprehensive think-tank supporting the objectives of the NMCG and is a Centre of Excellence for data collection, analysis and dissemination of knowledge and information for the sustainable development of the Ganga River Basin.

The IEWP, in collaboration with cGanga, intends to facilitate European businesses to explore and enter India's water sector and offer innovative solutions. For this, the IEWP has entered into a 'Memorandum of Understanding' with cGanga/IIT Kanpur, Vlakwa/VITO and WssTP with a hand-over during the 4th India-EU Water Forum (13 February 2019, New Delhi).

IIT Kanpur (hosting cGanga)

IIT Kanpur is one of the premier institutes to provide meaningful education, conduct original research of the highest standard and provide leadership in technological innovation for the industrial growth of the country. IIT Kanpur imparts and undertakes cutting-edge research in various areas of science, engineering, design, management, and humanities. The Centre for Ganga River Basin Management and Studies (cGanga) has been established at the Indian Institute of Technology, Kanpur (IIT Kanpur) as a Centre of Excellence to further the development of the Ganga River Basin. It acts as a comprehensive think-tank for the Ministry of Jal Shakti, Department of Water Resources,

River Development and Ganga Rejuvenation (MoJS, Dept. WR, RD & GR), Government of India, in its stated goals and objectives vis-à-vis the Ganga River Basin.

WssTP

WssTP is the recognized voice and promotor of water-related RTD and innovation in Europe. WssTP strives to increase coordination and collaboration, enhance the performance of water service providers, water users, and technology providers in a sustainable and inclusive way and to contribute to solving water-related societal challenges. WssTP was initiated by the European Commission (EC) in 2004 as an industry-led European Technology Platform (ETP). WssTP activities are organised in three key programmes - the Collaboration Programme, the Advocacy Programme, and the Market Programme - and three corresponding annual events - Water Knowledge Europe (WKE), Water Innovation Europe (WIE), and Water Market Europe (WME). For business and research collaboration with regions outside Europe, WssTP developed the WssTP International Water Dialogues (WssTP IWD).

VITO

VITO is a leading European independent research and technology organisation in the areas of cleantech and sustainable development, elaborating solutions for the large societal challenges of today. The water department focuses on integrated water solutions and decisions support maximising the societal and economical value of water. VITO's Flemish Water Knowledge Centre (VLAKWA) brings together all Flemish water stakeholders and aims to help realise a strong Flemish Water innovation programme and/or to assist the international valorisation of the knowledge acquired and results obtained locally. In 2016, VITO signed a Memorandum of Understanding with IIT Kanpur to collaborate with cGanga establishing its "Europe Desk" to contribute in the restoration and conservation of the River Ganga.

The IEWP has additional collaborations in place with other institutions and agencies working in complimentary areas that are tackled within the IEWP. In this context, 'Joint Expressions of Intent' or 'Memorandum of Understanding' have been signed with the following partners:

2030 Water Resources Group

The 2030 Water Resources Group is a public - private, civil society partnership hosted by the World Bank Group. The partnership supports country-level collaboration designed to unite diverse actors with a common interest in the sustainable management of water resources.

The engagement of 2030WRG in India began in 2010 with a national level hydro-economic analysis that paved the way for partnerships at state level. Currently, 2030WRG has established operational multi-stakeholder platforms in Karnataka, Maharashtra and Uttar Pradesh and also collaborates with the national government on the basis of a Memorandum of Understanding.

Through these multi-stakeholder platforms, 2030WRG is working together with multiple stakeholders to mobilize financing, policy reform and private sector partnerships needed to reduce waste water discharge and promote efficient water use. It also aims to help build institutional capacity and decision making on water efficiency, productivity and quality.

The cooperation activities as agreed between 2030WRG and the IEWP in February 2019 address the sustainable development of river basins and water governance, including the topic of water accounting as well as continue the collaboration for the development of a dashboard for water quality in the Hindon River Basin within the frame of the related multi-stakeholder platform. The IEWP is contributing with its applied expertise regarding RBM and water quality.

IHE Delft Institute for Water Education

IHE Delft Institute for Water Education is the largest international graduate education facility for water in the world and is based in Delft, the Netherlands. The Institute confers fully accredited MSc and PhD degrees in collaboration with partner universities.

Since 1957, the Institute has provided water education and training to 23,000 professionals from over 190 countries, the vast majority from Africa, Asia and Latin America. Also, numerous research and institutional strengthening projects have been carried out in partnership to strengthen capacity in the water sector worldwide. The Institute offers a unique combination of applied, scientific and participatory research in water engineering, combined with natural sciences, social sciences, management and governance. Since its establishment, the Institute has played an instrumental role in developing the capacities of water sector organizations in the Global South, not least by strengthening the efforts of other universities and research centres to increase the knowledge and skills of professionals working in the water sector.

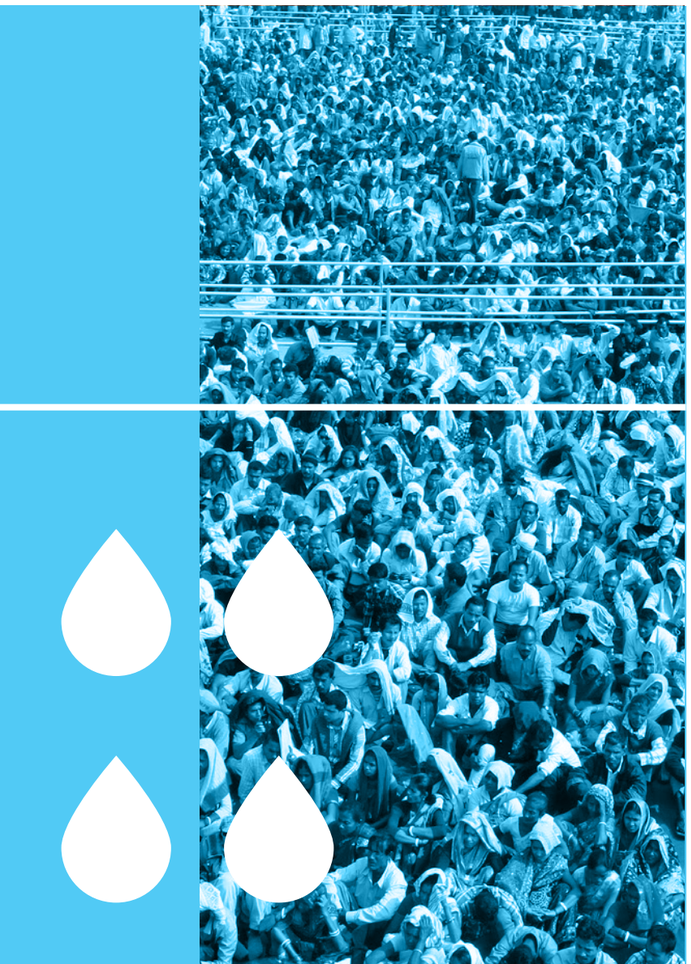
According to the MoU signed by IHE Delft and GIZ, the Institute will contribute to the India-EU Water Partnership with technical knowledge and expertise.

Water in India: Relevance, Challenges

As India continues to experience high economic and population growth, water demand for meeting various domestic and productive needs is also rising.

> **The country has only about 4% of the world's renewable water resources but is home to nearly 18% of the world's population.**

Thus, there are a new set of challenges for planning and managing available water resources to meet the growing water demand.



Water Stress

In India, only a few rivers are perennial (with year-round water flow), and most other rivers are seasonal in nature. According to estimates, by 2050, overall water demand will increase by 67% of 2010 levels (which was 710 BCM). At the same time, the national per capita annual availability of water reduced from 1816 cubic meters in 2001 to 1544 cubic meters in 2011. Water availability has declined significantly in some river basins, such as the Krishna and Cauvery. Per capita water availability is low in some areas, such as in the Sabarmati basin with 263 cubic metres per annum.

In those areas experiencing water stress (in physical or economic terms), there is need to manage and reduce water demand and consumption, for example through adapted crops, water use efficiency improvements, water pricing, and other measures.

Groundwater Overuse

In India, groundwater caters up to 85% of rural domestic water requirements, 50% of urban water requirements and more than 60% of irrigation requirements. Unregulated groundwater development has led to its overuse in many parts of the country. This has resulted in declining groundwater level, drying of springs and shallow aquifers and increased cost of water pumping. The lack of well-defined ownership rights for groundwater (water entitlements) and highly subsidised electricity supply for abstracting groundwater have also contributed to its unsustainable use.

In terms of groundwater quality, salinization of groundwater is more common in the coastal tracts of the country. Inland salinity in groundwater is prevalent in the arid and semi-arid regions of Rajasthan, Haryana, Punjab, Gujarat, Uttar Pradesh, Delhi, Andhra Pradesh, Maharashtra, Karnataka and Tamil Nadu. Several places in Rajasthan and southern Haryana have salt concentrations in groundwater so high that the groundwater is non-potable. High concentrations of fluoride, arsenic, iron and heavy metals in groundwater samples are observed in isolated pockets of the country.

Managing Climate Extreme Events

Climate extremes such as droughts and floods occur with regular frequency in different parts of India. Nearly one third of the country's area is drought prone. Recurrent drought results in widespread adverse impact on people's livelihoods and young children's nutrition status. Most drought events in India occur in parts of Rajasthan, Gujarat, Maharashtra, Madhya Pradesh, Uttar Pradesh, Chhattisgarh, Jharkhand, and Andhra Pradesh.

Further, about 40 million hectares (Mha), which is 12% of the total geographical area of the country, is prone to floods. In the Indo-Gangetic-Brahmaputra plains, the occurrence of floods is an annual feature. On average, about 7.5 Mha of area is actually affected by floods every year, with a range of consequences. Flood damages in economic terms (at current prices) are estimated to be about $125 billion during the period 1953-2010.

Water Pollution

Monitoring results obtained by the Central Pollution Control Board in 2011 indicate that organic pollution (BOD and coliform bacteria) continues to be a predominant polluter of rivers, lakes, ponds, tanks and groundwater. In addition, in some river stretches, as high as 63% of water samples did not meet the water quality standards for dissolved oxygen (DO), 73% for pH and 14% for electrical conductivity (EC).

The major contributors to pollution in aquatic resources are partially treated and untreated wastewater from urban settlements and industrial establishments. It is estimated that wastewater from urban centres will exceed 100,000 million litres per day (mld) by 2050. Rural India is estimated to generate less than 50,000 mld. Moreover, implementation of and adherence to water quality standards is poor. One of the major reasons is that institutions at the central and state levels, which are in charge of setting water quality standards, are the same as those that monitor them. Moreover, states often under-report pollution levels in the river stretch passing through their territories.

Inefficient Water Use

In India, most of the water supplied for domestic and irrigation use is highly subsidised, providing little incentive towards efficient water use. In addition, infrastructures, technologies and water governance require changes towards increased efficiency. Further, water revenue recovery is also low in India. Water supply utilities frequently run at a loss and are unable to even recover the operation and maintenance cost of water supply systems. This results in poor system efficiency and performance characterised by water losses and lower water delivery to the end user.

Inter-State Water Challenges and Cooperation

The constitution of India grants full control over water resources to the states (as per the Entry 17, List II, Seventh Schedule, Article 246 of the Indian Constitution). However, the states' rights are subject to any law enforced by Parliament regarding the regulation and development of inter-state rivers (as per Entry 56, List I, Seventh Schedule, Article 246 and Article 262 of the Indian Constitution). In fact, Parliament can develop laws relating to interstate rivers that are enforced at the national level (such as River Boards Act, 1956 and the Inter-State River Water Disputes Act, 1956).

The mechanism for addressing transboundary water disputes is already available in the form of the Inter-State River Water Dispute Act of 1956, which provides for the settlement of disputes by negotiations, failing which the dispute can be referred to a tribunal for adjudication. However, judgements by tribunals are often challenged by the riparian states. Further, no single river board has been constituted under the River Boards Act, 1956. This is largely due to the fact that in Section 4(1) of the Act, the exercise of power of the Government of India to establish a river board is dependent on a request being received from the state government and such a request has never been made.

Therefore, most of the water planning and development in the country is undertaken within administrative boundaries rather than by using river basin as the hydrological unit.

> **This approach has led to water conflicts, as most river basins are shared by several states, and water demand for meeting domestic, industrial and agricultural needs within each riparian state has gone up remarkably.**

These issues have intensified in the absence of River Basin Management Plans and active River Basin Authorities, which could coordinate and facilitate inter-state RBM.

Water in the EU: Changes, Lessons Learned

Despite decades of protection efforts, Europe's water is still under pressure. Half of the surface water bodies in Europe are reported to have deteriorated and not in good status. One fifth of the groundwater bodies are polluted, and one of every ten aquifers is overexploited.

> **The causes are manifold: diffuse pollution of fertilisers and pesticides from agriculture affects more than 40% of Europe's rivers; and anthropogenically transformed areas have altered around 40% of water habitats in rivers, deltas and estuaries in order to facilitate energy production, transport, flood safety and urban development.**

The increasing request of European citizens and environmental organisations for cleaner rivers and lakes, groundwater and coastal beaches is one of the main reasons why the European Union has made water protection one of its priorities. For example, 68% of Europeans think that water quality problems are a serious issue.

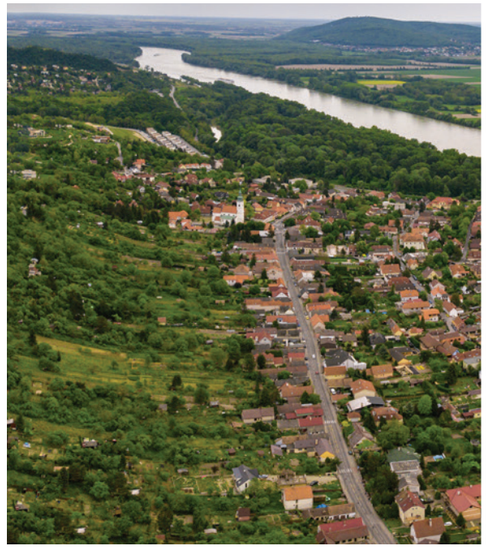
European water policy has undergone a thorough restructuring process, from its initial focus on drinking water standards in 1975, urban wastewater and nitrates pollution in 1991 and industrial pollution in 1996. Based on a policy dialogue in the mid-1990s, the Water Framework Directive (WFD) was adopted in 2000 with the following key principles:

- expanding the scope of water protection to river basins, including all inland, transitional and coastal waters, covering surface waters and groundwater;
- achieving "good status" for all waters by a set deadline;
- getting the (water) prices right;
- involving citizens for greater transparency and easier implementation; and
- streamlining legislation.

In two River Basin Management cycles (2009-2015 and 2016-2021), the EU Member States have drafted and implemented River Basin Management Plans in 270 basins overall, following the above principles but flexible to adapt to local governance and challenges. This has resulted in a vast amount of different experiences, lessons learned and case studies to overcome key water management problems.

In addition, the European Union has taken action to support, steer and control the implementation process. A Common Implementation Strategy exists since 2002 to help the implementation process, and so far 36 guidance documents have been agreed to clarify technical questions, in addition to several hundred workshops and meetings. Where needed, European institutions can take legal actions to impose penalties where the implementation has not been compliant; such action can be requested by European citizens.

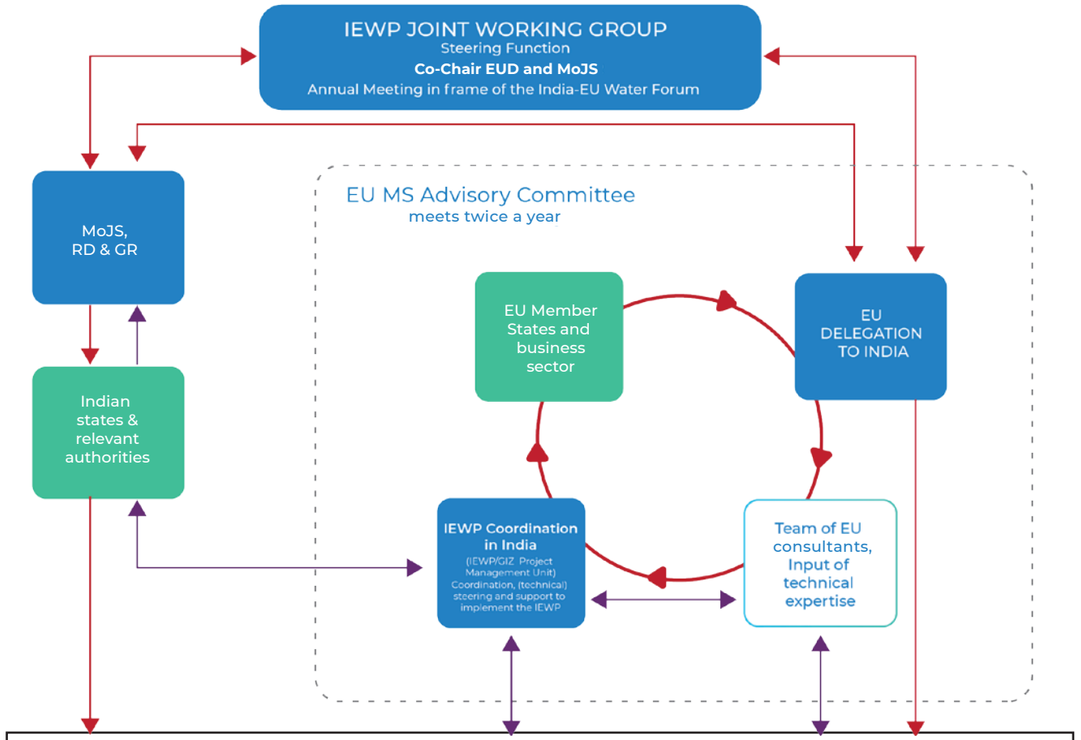
In comparison, the draft Indian Water Framework Law is much more policy and social matters-oriented, with the principal objective of establishing common governing principles for all States and especially a right to water throughout the country. It is also a less legally binding instrument, without the firm deadlines and penalties in the case of non-compliance, as is the case in the WFD.



The India-EU Water Partnership in Action

In June 2017, the Joint Working Group of the India-EU Water Partnership agreed on an IEWP Action Plan including nine priority areas for the cooperation and implementation of water resources as well as River Basin Management. In addition and cross-cutting, business cooperation is being strengthened.

For each of the priority areas, the Indian and EU nodal officers are responsible for developing and implementing activities. The Indian and European partners also engage respective additional administrations, institutions and businesses that shall contribute to and benefit from the Partnership.



The India-EU Water Partnership has also brought together several hundred Indian and European actors to discuss India's water challenges and possible solutions at the following events:

» 1st Indo-European Water Forum (New Delhi, 23-24 November 2015)

» 2nd India-EU Water Forum, at the World Sustainable Development Summit (New Delhi, 7 October 2016)

» 3rd India-EU Water Forum: "Jointly adapting European lessons for Indian rivers", with specific technical sessions on "Technology solutions for the water-energy nexus" and "Cleaning the river Ganga: From Data to Action" (New Delhi, 11-12 October 2017)

» 4th India-EU Water Forum with three sessions (13 February 2019, New Delhi): The 4th edition of the Forum was attended by about 200 participants including high level officials from India, the European Union, EU Member States, water experts, researchers, representatives from the EU and Indian businesses as well as civil society. The Forum consisted of a high level plenary, a technical session on River Basin Management and a business session exploring opportunities for EU businesses in the Indian water sector (New Delhi, 13 February 2019). To ensure best possible collaboration from the beginning, the 4th IEWF was organised back-to-back with the kick-off of EU-India Horizon 2020 projects. During the Forum, six Expressions of Intent (EoI) and Memorandum of Understandings (MoUs) between EU MS, several organisations and the IEWP were exchanged. Further, the IEWP website was formally launched as part of the high level session: www.iewp.eu.

» 6th India Water Week (24-28 September 2019): The IEWP was an international partner for IWW and organised a successful session on *Reuse of Treated Wastewater: Policy, Innovation and Technology.*

In addition to the above fora, the India-EU water exchange has been discussed at many other events, including the European Innovation Partnership on Water conference, in Porto (Portugal, 27-28 September 2017).

Sustainable Development of River Basins and Water Governance

A Tapi River Basin Management Plan is being developed on a pilot basis by blending EU good practices with Indian approaches. The approach is fully aligned with the principles of the River Basin Management Cycle that guides the integrated management of rivers in the EU.

The first step that is taken to develop the Tapi RBM Plan is the identification of Key Water Management Issues (KWMIs). This task was completed jointly with the following stakeholders:

- **Government of Gujarat:** a meeting was convened in Gandhinagar with the Additional Secretary and the Chief Engineer Water Resources Department, Govt. of Gujarat and officials of the Ukai Dam Project on 19 November 2018;
- **Government of Maharashtra:** a meeting was convened at the Tapi Irrigation Development Corporation, Jalgaon with the Chief Engineer, TIDC and other officers on 10 January 2019;
- **Government of Madhya Pradesh:** a meeting was convened with the Chief Engineer, Narmada Tapi Basin, Govt. of Madhya Pradesh and other officers on 7 February 2019;
- On 29 March 2019, **a Joint Stakeholder Meeting** was held between the then MoWR, RD & GR and the three state governments of Gujarat, Maharashtra and Madhya Pradesh;
- On 27 May 2019, a **formal Tapi River Basin Committee** was established, chaired by CWC, having all three states that share the Tapi Basin, the EU and the IEWP team as members;
- On 18 June 2019, the **Tapi River Basin Committee met for the first time** and agreed on vision and management objectives for all five Key Water Management Issues of the Tapi River Basin.

In the joint meeting the below-mentioned five Key Water Management Issues (KWMIs) have been agreed as the basis to develop the Tapi River Basin Management Plan including all components of the RBM Cycle:

1. Pollution from Urban Areas and Industries
- Organic point source pollution
- Point source pollution through hazardous substances

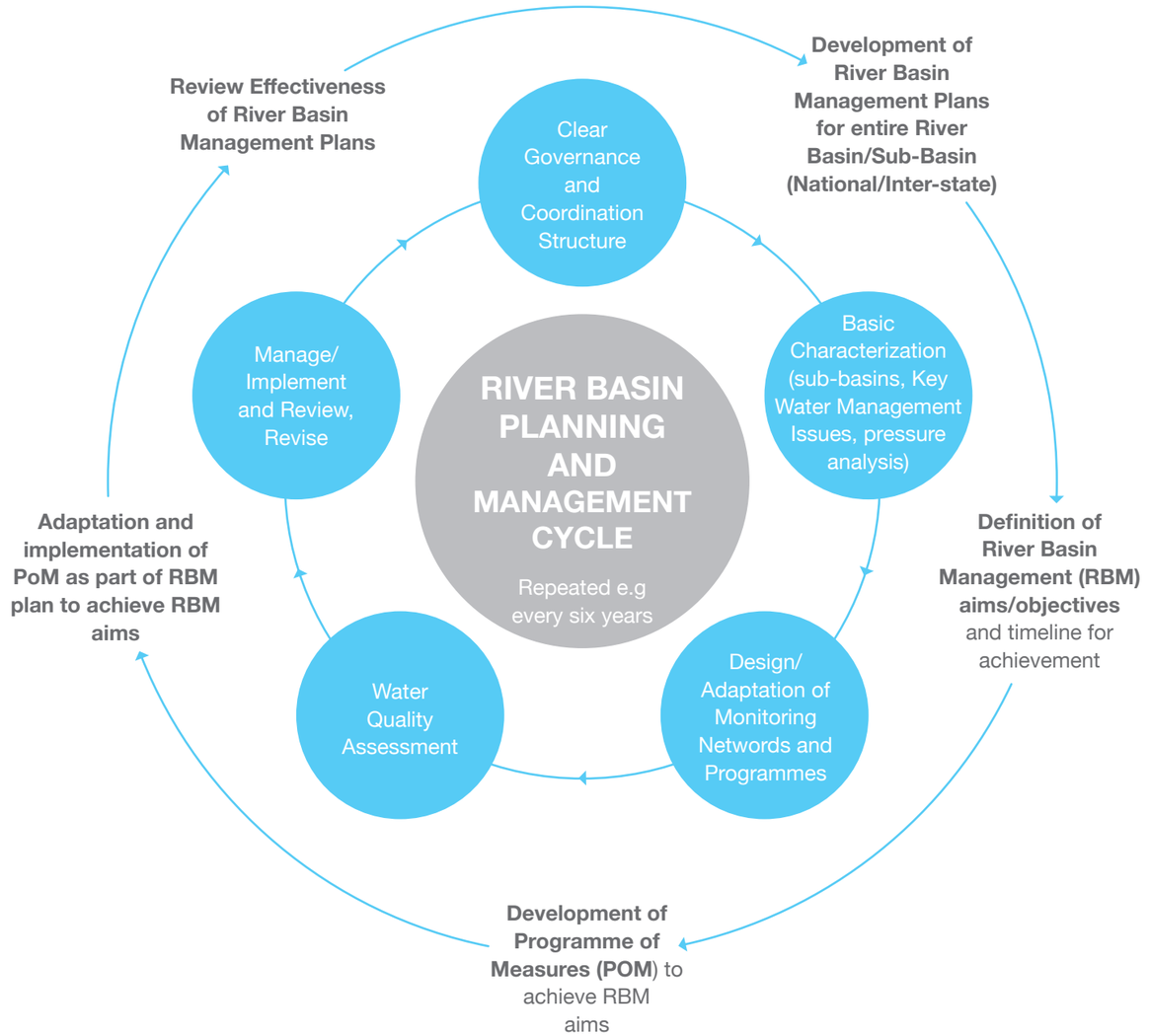
2. Pollution from Agriculture
- (Point and) non-point source pollution through nutrients and pesticides

3. Alterations of River Hydrology/Water Quantity
- e.g. alterations from irrigation/abstraction; crop patterns

4. Alterations of Groundwater Quality and Quantity
- e.g. alterations from irrigation/abstraction; solar pumping; pollution

5. Alterations of River Structure through Sand Mining

Planning Cycle



Environmental Flows (E-Flows)

A guidance document for pilot testing an E-flows assessment methodology for possible policy integration is being developed by Indian and European experts, involving Michael McClain (IHE Delft), Cedric Laize (Centre for Ecology and Hydrology) and Stefan Schmutz (University of Natural Resources and Life Sciences Vienna). Using this document, E-flows are being jointly assessed for critical stretches in three river basins (Ramganga, Mahanadi, and Bharathapuzha) having different social and hydrological regimes.

A joint technical workshop was organized from 21-22 May 2018 in Delhi with an aim to agree and adapt appropriate methodologies for the assessment of E-flows in the pilot river basins in India.

EU Experts from IHE Delft (the Netherlands) and CEH (UK), along with the subject experts and officers from Central Water Commission, Wildlife Institute of India, National Institute of Hydrology, Central Inland Fisheries Research Institute, WWF India and IEWP/GIZ PMU, attended this workshop.

EU Experts from IHE Delft, the Netherlands and CEH, UK, along with the subject experts and officers from Central Water Commission, National Institute of Hydrology and IEWP/GIZ PMU, visited the Ramganga River from 23-25 May 2018 to identify the critical river stretches.

For the identification of the critical sites in the Bharathapuzha Basin, a field visit was organized from 7-11 January 2019 involving the subject experts and officers from the Central Water Commission offices in Delhi and Kerala, and IEWP/GIZ PMU. This exercise served as a reconnaissance study for the E-flows assessment in Bharathapuzha River.

A field visit to the Mahanadi Delta was organized from 28 January to 1 February 2019 to exchange notes with Odisha state officials and CWC MERO divisional officers on the hydrological and ecological status of the delta as a basic step towards the assessment of E-flows at the pilot site.

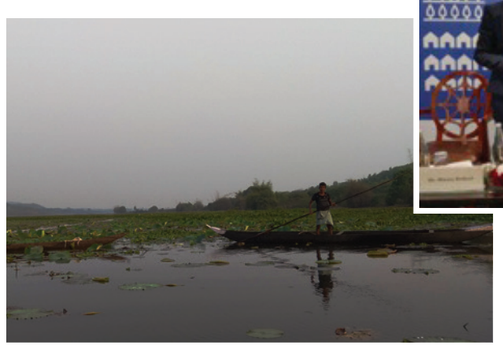
During the field visit, experience was also gained on various control structures in the Delta and eco-sensitive hotspots. The Joint Technical Working Group, involving officers/experts of IEWP/GIZ PMU, Central Water Commission and Central Inland Fisheries Research Institute, participated in the visit.

So far, four datasets have been compiled for the Ramganga River, which are currently analysed and assessed regarding E-Flows. Another joint field visit took place in January 2020 to further improve the methodology and guidance document. Data collection is ongoing in the other pilot basins.

On 21–22 October 2019, the Indo-German Cooperation with its project “Support to Ganga Rejuvenation” together with the IEWP and Indian authorities held the international workshop *Environmental Flows Assessment and Implementation in India*. The Honorable Minister of Jal Shakti, Shri Gajendra Singh Shekhawat inaugurated the event and launched the first version of the IEWP E-Flows Guidance Document. Renowned EU and international E-Flows experts contributed to the event resulting in fruitful discussions and steps forward to assess E-Flows holistically in India.

A guidance document has been prepared holding a step-by-step methodology based on EU (WFD) case studies to assess E-flows. The first version of the guidance was launched in October 2019 by the Honorable Minister of Jal Shakti, Shri Gajendra Singh Shekhawat.

The final guidance will incorporate all results from the pilot assessments and serve as a basis to develop a strategic document to support Indian authorities and experts in E-Flows assessment.



Ganga Rejuvenation

The pollution of the Ganga river is not only a subject of concern in India but has also raised awareness in Europe on India's water challenges to promote action to support the right measures to tackle pollution. Hence, the Ganga River Basin is in focus for action by the Indian government itself, many EU MS, other countries, donors and actors. The National Mission for Clean Ganga is the key Indian authority dealing with Ganga Rejuvenation under the Namami Gange Programme. IIT Kanpur coordinated a Ganga River Basin Management Plan that will be updated soon. The IEWP also focuses on the Ganga River Basin in its PR 3 receiving additional support through the activities of its Indo-German co-financing project 'Support to Ganga Rejuvenation Project'.

In the above context, the development of a water information system (Hindon; Ganga) is tackled that supports well-informed decision making, communication to the public and targeted investments – all on the basin-wide scale.

> **The aim is to make best possible use of data that are available with Indian authorities like the Central Water Commission (CWC), Central Pollution Control Board (CPCB), the National Mission to Clean Ganga (NMCG) and the National Hydrological Project (NHP).**

Bringing data which brings together various Indian water Dashboard. Specific missions aimed at data collection and technical discussion.

So far, the IEWP has drafted the document "Key policy issues and questions regarding water quality in India as basis to outline corresponding information needs for the India WRIS WebGIS and NMCG GIZ System Dashboards".

Based on identified Key Water Management Issues and related policy questions, data needs are being concretised for analysis and the development of thematic illustrations on water issues in maps.

> **Current activities focus on water quality, water monitoring and the identification of pollution hot spots. Draft hot spot maps for municipal pollution sources have been developed for the Ganga and Hindon Basins as the basis for next River Basin Management steps including future scenarios, measures and water quality improvement.**

The Ganga Hotspots Map is based on the report "Inventorization of Sewage Treatment Plants" (CPCB 2015) and the population data in main cities in the Ganga Basin provided by the 2011 Indian National Census. An estimation of sewage treatment needs per city/town was made - by multiplying inhabitants by effluent generation rates taken from previous CPCB reports - and compared with the actual operational treatment capacity reported in the inventory, thus providing a first glance of the wastewater treatment gap in each population centre. To overcome limitations of this initial analysis, in addition to updating the inventory to include the facilities built under the Namami Gange, the volumes actually treated should also be considered together with their compliance to effluent quality standards. Finally, the status of sewage networks and their connection to the STPs should be elucidated.

> **Further actions are envisaged in the coming months involving joint on-site work of Indian and European experts. This includes further work in the Hindon River Basin - a heavily polluted stretch of the Ganga Basin in the state of Uttar Pradesh.**

In this context, the World Bank's Water Resources Group 2030 established a multi-stakeholder process, in which the IEWP is participating and pro-actively contributing to the Key Water Management Issues on Pollution from Urban Areas. In addition, the Netherlands is involved in the activity.

The IEWP activities include:

1.
Improve data management for well-informed decision making and monitoring;

2.
Develop a strategic river basin management approach including Key Water Management Issues;

3.
Related visions and management objectives to tackle the Hindon River's rejuvenation;

4.
Clear overview on pressures and impacts stemming from municipal pollution in the Hindon Basin as the basis for measures.

Outcomes and technical experience will flow into the IEWP PR1 (River Basin Management) and vice versa.

In Kinoli village, the strong flow of the Hindon river is an anomaly. The rest of the river has no continuous flow.

Groundwater Use

As per the groundwater assessment in 2013 by the Central Ground Water Board, the annual groundwater abstraction in India was about 62% of the net annual ground water availability. Out of this, about 90% was used for irrigation. Further, out of the 6584 assessed groundwater units 16% were categorized as over-exploited, i.e. the annual ground water extraction exceeds the net annual ground water availability; 4% of the units were critical, i.e. extraction of ground water is above 90% and within 100% of net annual ground water availability; 10.5% of the units were semi-critical, where ground water development is between 70% and 100%; and about 1.5% of the units were completely affected by saline ground water. The groundwater regulation and its management at the river basin scale is the biggest challenge.

Under the IEWP, knowledge on EU approaches in groundwater management is shared and capacities to deal with groundwater problems are being built up. The activities contribute to the development of the Tapi River Basin Management Plan as groundwater is an important water source in this basin that is facing different management challenges. Further, technical support on the use of innovative technologies for aquifer mapping and data analysis is provided.

Presently, EU expertise is being provided to assess the pressures and impacts on groundwater in the Tapi River Basin, which will use the river basin management approach.

For this purpose, hands-on activities are undertaken jointly with the Central Ground Water Board and its regional offices in the Tapi River Basin to complete a characterisation template, which serves the assessment of risks on the identified Groundwater Management Units.

Further, capacity building initiatives in terms of knowledge exchange on EU approaches to groundwater management will be organised for the Central Ground Water Board and the Tapi River Basin State Groundwater Departments. Finally, it is also planned to assess the possible impacts of solar pumping schemes on sustainable groundwater management.

Water Use in Irrigation

In India and the EU, major investments have been made over the past decades towards more efficient and productive irrigation.

The Indian Ministry of Jal Shakti, Department of Water Resources is investing considerably in small and medium irrigation schemes to support rural livelihoods and food security. To ensure water security, both monitoring and the continuous improvement of efficient water use is of vital importance.

The IEWP, with technical input by IHE Delft and the Indian MoWR, the Central Water Commission and local stakeholders, is developing a practical method to assess irrigation efficiency based on selected pilot areas.

In March 2019, Professor Charlotte de Fraiture from IHE Delft and officials from the then Ministry of Water Resources, River Development & Ganga Rejuvenation, the Central Water Commission, relevant state governments and the IEWP/GIZ PMU visited the Gollavagu Project, Telangana (4-5 March 2019); Lower Panzara Project, Maharashtra (5–7 March 2019); and Mahuar Project, Madhya Pradesh (8–10 March 2019), to achieve a common understanding of the current situation and possible shortcomings. This well-informed basis now supports the assessment of irrigation efficiency (operational efficiency, field application efficiency and irrigation uniformity) and the development of an Irrigation Efficiency Assessment Protocol.

A canal automation Action Plan for the tertiary distribution system of the Upper Indrawati irrigation project in Odisha is being planned on a pilot basis and related implementation is currently initiated.

Capacity Building

Capacity building and technical training exchanges are and will be organized on several topics, including ecological flows, River Basin Management, groundwater management, irrigation efficiency, wastewater re-use, and more.

The core partner for capacity building activities in India is the National Water Academy in Pune, which has the mandate to train in-service engineers of various central/state organizations involved in the development and management of water resources.

In the past, several training workshops have taken place, including on:

- River Basin Management Planning and Governance (New Delhi, 14-15 June 2016);
- Water Allocation, Water Economics and E-flows in River Basin Management (New Delhi, 14-15 September 2016);
- River Basin Management Planning (Hyderabad, 13-14 February 2017);
- Ecology-based E-Flows Assessment (Mahanadi Delta, 18 April 2019);
- Groundwater assessments as part of River Basin Management Plans (Bhopal, 21–25 January 2019);
- River Basin Management and Implementation (in collaboration with Indo-German Cooperation, 30 September 2019, New Delhi).

In addition, in 2017 a "Blueprint for Water Accounting in India" was developed to provide thoughts on how to better manage and assess data on water quantity and water economics within India's water management.

Several technical workshops were held. In addition, training was developed between CWC, IWMI and IHE Delft to build capacity for using earth observation data as a means for calculating water consumption in India, with the applied case to the Cauvery basin.

A study visit of IIT Kanpur and Centre for Ganga River Basin Management and Studies (cGanga) was made to Europe, including meetings at the European Commission Director General on the Environment, to discuss water legislation and its implementation (Brussels, 19 May 2016). Furthermore, in October 2017 the "G-STIC Global Science, Technology and Innovation Conference" in Brussels was organised by VITO, with support from TERI.

More recently, Mr. Andreas Scheidleder from the Austrian Environmental Agency visited India from 21-25 January 2019. The objective of the mission was to share and exchange EU expertise on groundwater issues and assessment and management on the river basin scale with Indian counterparts from the Central Ground Water Board (CGWB) and with the state administration in the Tapi River Basin.

Any capacity building is announced on the IEWP webpage (www.iewp.eu).

Treated Wastewater Re-Use

The UN Sustainable Development Goal on Water (SDG 6) specifically targets a substantial increase in recycling and safe water reuse globally by 2030. Water reuse is a top priority area in the *Strategic Implementation Plan of the European Innovation Partnership on Water* and maximisation of water reuse is a specific objective in the Communication Blueprint to safeguard Europe's water resources.

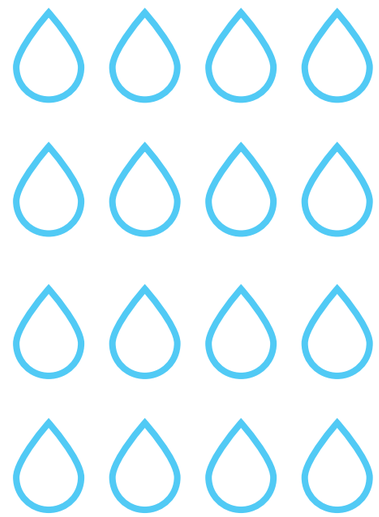
Reuse of treated wastewater can provide significant environmental, social and economic benefits.

Moreover, when compared to alternative sources of water supply such as desalination or water transfer, water reuse often turns out to require lower investment costs and energy, therefore also contributing to reducing greenhouse gas emissions.

Considering the situation in Europe, about one billion cubic metres of treated urban wastewater is reused annually, which accounts for approximately 2.4% of treated urban wastewater effluents and less than 0.5% of annual EU freshwater withdrawals. But the EU potential is much higher - estimated in the order of 6 billion cubic metres – six times the current volume. Both southern Member States, such as Spain, Italy, Greece, Malta and Cyprus, and northern Member States like Belgium and Germany already have in place numerous initiatives regarding water reuse for irrigation, industrial uses and aquifer recharge.

In India, certain initiatives to operationalise water reuse have been taken by the government and many regional governments. Efforts will provide strategic support to further tackle the topic and to facilitate the development of policy instruments.

As a first step, the potential and challenges for the re-use of treated wastewater in the Ganga and other river basins have been screened. A comparative report of EU and Indian wastewater reuse policies was discussed within a roundtable discussion that involved relevant Indian authorities and EU experts (July 2019). The report will form the basis to support the drafting of a national policy on wastewater reuse in India.



Collaboration in Research, Innovation & Technology

The IEWP explores ways to link present research and innovation projects between the EU and India within selected IEWP priority areas to ensure the best possible cooperation. In this context, synergies with the EU's Horizon 2020 water projects will be mutually exploited. Further, the IEWP will support the dissemination of EU best technologies.

In recent years, India and Europe have collaborated extensively to enhance and enrich each other's technological and scientific knowledge and management capacities to cope with increasing impacts and stress on water resources. Increasing heterogeneity in the uneven distribution of water resources triggered by climate change, extreme water-related events (floods and droughts) and increasing demand due to population growth and economic development add additional stress to water, environment and food security and to the national economy. Many of these water challenges are common to India and some EU Member States. Hence, the need for a concerted effort by India and the EU to address these issues arises. This will also support the achievement of the Sustainable Development Goals' (SDGs) agenda

on water. Seven action research projects are being co-funded by the EU and India under the Horizon 2020 programme of the EU (PAVITR, LOTUS, INDIA-H2O, PANI WATER, PAVITRA GANGA, SPRING and Saraswati 2.0). Within the next four years these projects will develop new and/or adapt the most suitable existing innovative and affordable solutions for Indian conditions, both in urban and rural areas, addressing one or more of the following broad challenges:

» Five technologies pilot tested for drinking water purification with a focus on emerging pollutants;

» 37 technologies pilot tested for waste water treatment, with scope for resource/ energy recovery, reuse, recycle and rainwater harvesting, including bioremediation technologies;

» 19 technologies pilot tested for real time monitoring and control systems in distribution and treatment systems.

In all cases, the involvement of relevant stakeholders, including industry partners, local authorities, water users, research centres and social communities, and consideration of possible gender differences in the use and need of water is essential in order to enable a strong demonstration component involving the transfer of European knowledge, expertise and technology to facilitate future in-house replication.

To operationalise the cooperation between the IEWP and the H2020 projects, the 4th India-EU Water Forum (13 February 2019, New Delhi) was organised back-to-back with the kick-off of the action research projects (14–15 February 2019, New Delhi). Further exchange on possible cooperation between the IEWP and the H2020 projects is currently taking place.

Business Cooperation

The European Union has developed a world-leading water sector that includes 9,000 active Small, and Medium Enterprises (SMEs) and provides almost 500,000 full-time equivalent jobs in over 70,000 water services companies. The sector represents an annual investment of over €33 billion and a turnover of €72 billion per year. Many of these companies are able to provide solutions that fit not only European but also Indian challenges.

The following government initiatives are relevant with regard to the Indian water sector, and provide opportunities for private sector engagement:

» Clean India Mission - Urban Development

» Namami Gange - River Rejuvenation

» National Project on Aquifer Management - Ground Water Use and Recharge

» Kisan Urja Suraksha evam Utthaan Mahabhiyan (KUSUM) - Water Use in Irrigation

» Artificial Recharge and Rain Water Harvesting - Ground Water Use and Recharge, Solar Pumping Irrigation

» National Water Quality Monitoring Programme - Blue Water Monitoring, River Rejuvenation

» National Plan for Conservation of Aquatic System - Urban Development

» Smart Cities Mission - Sanitation and Urban Development

» Pradhan Mantri Krishi Sinchayee Yojana - Water Use in Irrigation

» Atal Bhujal Yojana (ABHY) - Water Use in Irrigation

» AMRUT - Urban Development

» Sagarmala - Urban Development

Still, the number of EU businesses engaged in India is rather limited. Given the various investment opportunities in India's water sector, the IEWP intends to provide a platform for establishing successful EU-India business cooperation models and illustrate areas of opportunities for EU and Indian businesses to collaborate. Examples of such platform activities include:

» Technology and governance sessions on "Technology solutions for the water-energy nexus" and "Cleaning the river Ganga: From Data to Action" during the India Water Week 2017 (New Delhi, 12 October 2017)

» Participation in "WISE (World Initiative to Save Environment) 2017" organised by the Danish Water Forum (New Delhi, 6-7 November 2017)

» Clean Ganga Europe Desk Conference with IEWP and business involvement, (Brussels, 27 September 2018)

The EU Circular Economy Mission 2018 was carried out under the EU–Resource Efficiency Initiative (EU-REI) from September 4–7, 2018 in New Delhi. The Mission was led by the then Commissioner for Environment, Maritime Affairs and Fisheries, Karmenu Vella, with over 80 delegates from the EU participating in high-level political and business meetings to discuss and exchange ideas on policies and practices on resource efficiency and circular economy. An exchange took place with the India-EU Water Partnership in New Delhi on 5 September 2018. The main objective was to provide comprehensive information to EU MS and EU businesses on the business potential available in the Indian water sector.

Conclusions and Next Steps

In 2019, an IEWP scoping study was developed by the European Business and Technology Centre (EBTC) to provide insights on current EU business engagement and to support infrastructure for EU water companies in the Indian water sector. The IEWP scoping study holds strategic recommendations for increased involvement of EU water companies through the IEWP. It was highlighted that the IEWP can be a driving force for project-based collaboration by leveraging IEWP's access to relevant Indian partners, its existing knowledge pool and insights on relevant business opportunities stemming from requirements of industries and governments.

This project-centric and demand-driven approach can be reinforced by establishing a conducive collaboration framework, leading to enhanced business support, which comprises of the following:

1.

Focused knowledge-sharing activities on key information and core competences on the Indian water sector for key stakeholders from Europe, e.g. EU Member States, bilateral chambers, industry associations and business member organisations as well as water businesses and research institutes, etc.

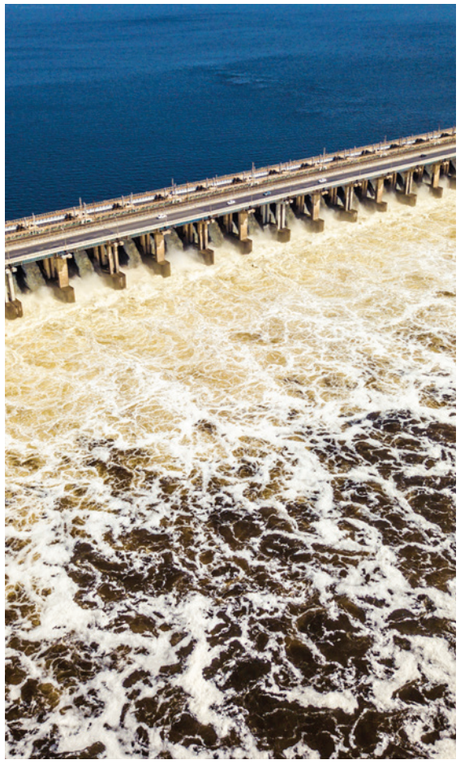
2.

Enhancing existing project related frameworks for business engagement which includes, but is not limited to:

- Capacity building on financially viable project structures (e.g. PPP models), project financing models, and on procurement of innovative technologies
- Demand-driven selection of EU technologies in alignment with the priority areas of the IEWP
- Support mechanism for establishing a proof of concept for European solutions in India with suitable Indian partners

  Since September 2019, the IEWP is linked to the European Technology Engagement Cell (ETEC). European companies interested in business involvement in India with their water-related technologies and solutions can register under: *www.iewp.eu/business-cooperation* to receive more insight and information on business opportunities in the Indian water sector.

The India-EU Water Partnership aims to be a significant contributor and game changer for the Indian water sector by addressing governance and management challenges. The sharing of EU experience and providing EU expertise on River Basin Management Planning will create further joint activities, the results of which should flow into policies and strategies of Indian approaches. The IEWP has already become an important platform for EU Member States, EU businesses and the other EU stakeholders for collaborating and synergising their actions in providing solutions to India's water challenges. Future activities will further improve India-EU policy dialogue through joint implementation of activities. The IEWP moves towards a Partnership that facilitates actions of EU MS and EU businesses through knowledge, networks in India as well as creating easy entry points into the Indian water sector.



More information at: www.iewp.eu

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