India Water Impact Summit (IWIS) - 2012

Preface

We are delighted to welcome all participants from within India and around the world to the inaugural version of India Water Impact Summit.

The Summit is an aggregate of numerous activities that have been taking place over the last year or so in regards to managing India's water resources. The organisers decided to establish a new multi-disciplinary, multi-stakeholder forum that brings together policy makers at national and regional level; technology & engineering firms; finance and investment representatives and the civil society.

The Summit will address both the macro as well as the micro issues related to the water sector moving the market dynamics towards the adoption of an integrated water resource management model. The Government of India needs to deploy large amounts of capital investment into the water sector across the different riparian groups – agriculture, that is estimated to take 85% of surface water, Industry, that draws nearly 9% of water and households that get only 6% of surface water.

It will also address issues of a different gauge - water quality and quantity. The platform will offer an opportunity to develop and showcase economic, technical, social and financial solutions that can be propagated into the market.

On November 5, 2008 River Ganga (Ganges) was declared as a national river. The River warrants such a status as it is revered as a "living being", a holy mother for scores of Indians that not only see it as the supreme purifier but also depend on it for their daily livelihood. What happens in this basin has a large impact on the nation since nearly 50 crore (500 million) people live within the River Ganga Basin. Additionally the strategies developed to improve the state of water bodies in this basin can be replicated across the country.

The state of the river can be measured easily by the pollution level within it. It is estimated that nearly 12,000 MLD (million litres per day) of sewage is discharged into the river and nearly 3000 MLD of toxic industrial effluent flows into the river. The volume of effluent that is partially treated is approximately 35%.

The clean-up of River Ganga (and other rivers flowing into it such as the Yamuna) has been an emotive subject for scores of Indians and people internationally. The past efforts have at best delivered moderate results. It is important that all concerned understand what the clean-up actually entails. There are two primary methods which when implemented in a comprehensive manner will bring about a radical change in the state of the river.

First, implement a framework that stops all effluents from going into the river. This is being purported through the Zero Liquid Discharge (ZLD) philosophy which suggests that water, once drawn out from the river body, should not be returned to the river. It should instead be recycled and reused. Of course this also applies to the ground water being drawn out for various purposes. If the model is implemented in its entirety the river over the years will see a dramatic reduction in pollution levels and with fresh water coming from upstream sources should clean itself up.

The second major strategy to restore the river is to have more water in the river system. Since the agriculture sector is major riparian of the river water (estimated to utilise 85% of the surface water), bringing greater irrigation efficiency in the agriculture sector can have a dramatic impact on the water

levels and therefore on the pollution.

The water quantity issues lead to roaring debates as to which economic sections of the society have greater access to water. The answer to that is very simple – all. However it is easier said than implemented. There is massive room for improvement in usage of water across every single strata of society. The agriculture sector must look at numerous techniques to reduce water consumption such as crop yields, crop selection, irrigation techniques, moisture management techniques etc.

The industry must also reduce its water footprint dramatically both in consumption as well as in its discharge. The households are already at the brunt of water shortage. Increasing urbanisation is increasing the stress on ground water levels.

None of the above is new in its content but it is in the implementation of it where the Summit proceedings will move the discourse towards adopting a new paradigm which is to truly understand and appreciate water as a precious natural resource. This requires holistic new thinking from many different angles.

It is estimated that to restore Ganga to its former glory will require Rs. 5 lakh crores or nearly $100bn. The Government doesn't have the luxury of that much available capital and must therefore use many new models including extensive use of Public Private Partnerships (PPP).

The term PPP brings about different reaction from different groups and perhaps all those reactions, positive and negative have a genuine reason to take that disposition. But certain myths must be debunked that PPP is equivalent to privatisation. PPP is merely a contract between the Government and a third party to deliver certain services. If the third party is required to invest in the capital infrastructure then it needs adequate compensation that is risk adjusted. This is not tantamount to saying that water is now owned by private sector.

The contract must be governed and monitored by a regulatory framework which provides a band for water pricing, the exact definition of water rights and its usage. Whilst the framework may apply to concessionaire, it must also equally apply to households and the other riparians such as industry and agriculture.

The Summit comes at an anvil of important events - the new Water Policy and the next phase of Jawaharlal Nehru Urban Renewal Mission and the completion of the first and starting version of the Ganga River Basin Environment Management Plan that is being developed by the consortium of 7 Indian Institute of Technology (IITs).

It will be a major platform to connect India's water economy to international expertise. A number of countries are expected to participate in the Summit and this level will grow dramatically over the coming years as major water related projects come to the fore.

This Forum will also highlight the importance of innovation particularly in the water sector. A number of countries such as Canada, Israel, Australia, Singapore and parts of Europe have developed water focused innovation clusters that not only increase the rate of technology transfer but also have a net positive contribution to the GDP by creating more jobs and increased exports. As India moves towards a new water economy it must also develop its own innovation clusters to sustain and support this growth.

Water economy, as the world knows it, is just not the piped water. It also includes those who are in distributed environments such as the rural population or the urban poor. The former are seriously affected by ground water pollution and depleting levels, whilst the latter in many circumstances end up paying

nearly 100 times more than those drawing water from the municipal pipes. The Summit recognises this water inequality and will put great efforts to develop innovative models for water and sanitation in the distributed environment.

No major development can take place without the financial backing. Although PPP is one such methodology that the Government can use to finance water projects, but it is merely a different source of capital. It doesn't affect the underlying risk associated in developing water projects. The Summit will highlight some of the cutting edge financial instruments that are being developed to improve the attractiveness of water projects. Some instruments are: Water Quality Trading; Water credit wraps; water insurance; water bonds and community based financing models.

The role of civil society and faith groups is highly pronounced in the Indian context. It is imperative that the Government and all concerned actively reach out to representatives of these groups that provide a barometer to the needs of the people of India from both civil as well as religious contexts. The role of religion is huge particularly in the context of Ganga. The Summit will provide a forum for interaction and collaborations with civil society and faith groups.

Whilst the Summit itself will be an annual activity but between events it will progress the discussions on each of the topics as model projects so the recommendations can become a reality. We encourage and request all participants to actively engage not just in dialogue but also in development and implementation of these new models.

We would also like to thank the Indian Government, strategic partners, panelists and speakers, sponsors and the staff and volunteers who put in a lot of faith and hard work into making this Summit a reality.

We hope you enjoy every bit of it as we have in bringing this Forum to you.

Mr Sanmit Ahuja
CEO, ETI Dynamics (UK) &
Summit Co-Chair

Dr Vinod Tare
Professor, IIT Kanpur &
Summit Chair

India Water Impact Summit (IWIS) - 2012
Special Session: Day 1: December 3, 2012; 17:45 – 18:45

Water Innovation in India

Special Session

December 3, 2012
17:45 – 18:45 hrs

Water Innovation in India

Session Chair
Mr Amitabh Kant
CEO, DMICDC

Welcome: Prof Indranil Manna, Director, IIT Kanpur

Concept: Mr Sanmit Ahuja, CEO, ETI Dynamics (UK)

Intellectual Capital and Resources: Dr Vinod Tare, Professor, IIT Kanpur

Managing Innovation Clusters:

1. Dr Brent Wootton, Chair, Ontario Water Technology Acceleration Programme (Water TAP)
2. Mr N Vittal, Vittal Innovation City
3. Mr Ajai Chowdhry, Founder and Ex-Chairman, HCL

Address by Chair

Summary Remarks

Discussion Points

1. The need for water innovation in India
2. What innovation eco-system does India need to create to address water issues and manage water resources?
3. Key Developments in this area

Proposition

The word innovation generally has technological connotations but in case of a subject like water new paradigms are required in financial, economic, regulatory and social terms.

Innovation can truly take place when the right eco-system is in place that is progressive and inclusive. This eco-system in the context of water must have the following components:

1. Core Research
2. New Product Development
3. Mapping and Modelling
4. Social and Economic Development
5. Technology Transfer
6. Professional Services
7. Skills and Training
8. Technology & Instrumentation
9. Implementing new models
10. International connectivity

11. Investments and Finance
12. Social Inclusion
13. Governance, Conflict Resolution framework

These building blocks will usher in the much needed convergence of Science, Industry, Policy Makers, Civil Society and Finance community.

India is uniquely placed to adopt and create all of these components. It is already one of the largest water consumers/market in the world. As it embarks upon major urban infrastructure development and rural/ agricultural sector development, it must utilise this opportunity to create an eco-system of this nature.

Development of this eco-system will accelerate the throughput of water related projects and therefore increased investment into the sector.

The connectivity with other innovation clusters will increase the rate of technology transfer and bring in new innovations into the market. Whilst a number of these new technologies may not work as-is in India, the country can adapt these and take a giant leap forward also in new product development terms.

However the biggest benefit of developing an innovation eco-system will come in forms of expanded markets. If the proponents of the stakeholders just pivot and use India as a global centre of excellence in water innovation then the world markets open up. This is particularly true of the dozen or so high growth markets which all have characteristics such as India.

Not only can India utilise the innovation for its own benefit but can also share the best practices and related developments in other countries.

Opportunities like this come only once in a lifetime and this is one such opportunity India must grasp with both hands.

Track A
Policy and Economics of Water

Session : A1

December 3, 2012
12:00 – 13:30 hrs

Managing Water Requirement for Nature and Development

Session Chair	Session Moderator
Swami Avimukteshwaraanandah Saraswatee Ganaga Seva Abhniyam, Varanasi	Ms Bahar Dutt CNN-IBN

Panelist

1. Mr Anupam Mishra, Founder Member, Gandhi Peace Foundation
2. Ms Sejal Worah, Director, WWF - India
3. Dr Uday G Kelkar, Director of NJS Consultants Co. Ltd
4. Dr P K Jain, Technical Advisor PHE, Meinhardt India Pvt Ltd
5. Mr Paritosh Tyagi, Chairman, IDC Foundation and Former Chairman, CPCB
6. Dr Brij Gopal, Professor, Centre for Inland Waters in South Asia

Setting the Scene: Dr Vinod Tare, IIT Kanpur [12:00 – 12:15]
Remarks by Panelists [12:15 – 13:00]
Discussion and Summary Remarks [13:00 – 13:20]
Address by Chair [13:20 – 13:30]

Discussion Points

- Should water requirements for nature (e.g. environmental flows) have priority over water requirements for development?
- Should major urban/industrial water requirements be met by recycle and reuse practices thereby reducing fresh water abstraction and pollution? Can the Municipalities and Industries afford this?
- Is it possible to reduce irrigation water requirements without compromising on agricultural production, and can the country afford necessary technological changes, cropping pattern, etc.?
- Should there be credit system for leaving water for nature or from one sector to the other?

Proposition

Realizing the adverse impacts of developmental approach followed over the past 100 years, following is now generally accepted in terms of usage of water.

- The usage of water should be anterior to nature and ecology.
- The usage should have sequential priority from 'water for life' to 'livelihoods' to 'developmental activities'.
- There should be institutional arrangements for usage of water based on principles of equity, resource-conservation, protection of water resources, and harmonization of water use.

Adoption of above warrants a paradigm shift in our developmental approach that leaves water, both in terms of quality and quantity, for the sustainance of natural systems as first priority. At the watershed or basin level, storage of rain water, both surface and subsurface, needs to be promoted to rejuvenate ponds, lakes, reservoirs and rivers with the involvement of local community and state-of-the-art technologies. The requirements for developmental purposes is to be met by managing the demand as well as use of

innovations in the water sector, industrial processes and agriculture. This essentially means bringing in reforms in water management for rural and urban areas, industries and agriculture. Following sections outline the plausible approaches and concerns.

1. Managing Water for Rural and Urban Requirements

The quantity of water used in terms of percentage of total water consumption is much less for rural and urban domestic and commercial needs, but quality of water used has direct consequences on health of the people. Also, major portion of the water used in this sector flows out as sewage, and is responsible for deteriorating the quality of water in the natural water bodies. Redressal of this problem warrants isolation of human excreta or sewage from fresh water sources. This is now being voiced on several forums calling for separation of "rivers and sewers". It is with this background that the concept of zero liquid discharge (ZLD) is gaining acceptability. Also, the ZLD paradigm has the potential to promote reuse and recycle thereby reducing fresh water abstraction and leaving water for nature.

The state-of-the-art in sewerage and sewage treatment today make this proposition feasible. However, concerns are expressed in terms of affordability by ULBs, acceptability by the public at large, and whether allocation of requisite resources in terms of land and energy, in particular, and finances in general is worth and possible. Such questions can be answered in a meaningful way only when expenditure on health, water security for future, and sustainable rural and urban development issues are tackled in a coordinated manner.

2. Managing Water for Industrial Requirements

Quantity of water required for industrial uses is also much less in comparison to the total water requirements as well as water required for rural and urban needs. Again, much of the water used by the industries is released as industrial effluents with much higher pollution load and toxicity in comparison to the sewage. It is proposed that by and large industrial effluents should be isolated from the fresh water bodies adopting ZLD concept and mandating reuse and recycle.

Again, the state-of-the-art in treatment of most industrial effluents today make this proposition feasible. However, concerns are expressed in terms of affordability by the industry, and whether allocation of requisite resources in terms of land and energy, in particular, and finances in general is worth and possible. Such questions can be answered in a meaningful way only when environmental costs are internalized and made available in terms of the percentage of the product cost.

3. Managing Water for Agriculture and Horticulture

Quantity of water required for agriculture and horticulture is much higher in comparison to the water required for industries and rural and urban needs. Considerable improvements are required to enhance water use efficiency in this sector keeping or even enhancing agriculture produce. Some of the strategies include improved irrigation methods (e.g. drip irrigation in place of flood irrigation), crop rotation, mixed cropping, mixing horticulture with agriculture, organic farming, etc. All these measures appear to be feasible. However, implementation of these measures will require change in attitude of the farming community, investments, and policies and regulations to encourage such changes.

5. Incentives

Altering existing water allocation and use pattern is an uphill task and will require concerted efforts on part of all concerned. Incentives such as water credits, water trading, etc. may have to be introduced to encourage sparing/returning water for nature's requirement.

Session : A2

December 3, 2012
14:30 – 15:45 hrs

Bringing Zero Liquid Discharge Concept

Session Chair	Session Moderator
Dr Rajiv Sharma Mission Director, NMCG	Mr Sam Yamdagni MD, Xylem Water Solutions India Pvt Ltd

Panelist

1. Dr Deen Dalayan, Dy Advisor, MoUD
2. Dr Suresh Rohilla, Programme Director, CSE, New Delhi
3. Dr Indra M Mitra, World Water Works (USA)
4. Sri S Venkataramana, Director (Operations), CPCL, Chennai
5. Dr P K Jain, Technical Advisor PHE, Meinhardt India Pvt Ltd
6. Dr Vinod Tare, Professor, IIT Kanpur

Setting the Scene: Dr Purnendu Bose, Professor, IIT Kanpur [14:30 – 14:45]
Remarks by Panelists [14:45 – 15:15]
Discussion and Summary Remarks [15:15 – 15:35]
Address by Chair [15:35 – 15:45]

Discussion Points

1. Can we achieve the target of Un-polluted Flow by following present practice of discharging treated sewage and industrial effluents?
2. What levels of treatment (secondary or tertiary) necessary to achieve desired quality of river waters?
3. Is ZLD a sound concept?
4. Is discharge of treated sewage a desirable way of maintaining E-flows in dry weather?
5. Can treated sewage be used for incidental recharge of ground water through unlined water bodies such as ponds, reservoirs or cannals?
6. Can the ULBs and Industries afford to implement ZLD Concept?
7. Will implementation of ZLD concept help in recycle and reuse of water?
8. Can sewage and industrial effluents be considered as reliable sources of raw water for non-human contact uses of water?
9. Can a self governing framework be created through implementation of ZLD concept?

Proposition

1. What is "Zero-Liquid-Discharge"

It is proposed that no domestic sewage (untreated, partially treated, or fully treated) shall be discharged from Class I towns (population > 100,000) in Ganga Basin to any river, to drains ultimately discharging into rivers, or pumped to the subsurface.

It is also proposed that no effluent (untreated, partially treated, or fully treated) shall be discharged from large/medium industries and industrial clusters/parks in Ganga Basin to any river, to drains ultimately discharging into rivers, or pumped to the subsurface.

2. Present Scenario

Despite the existence of rules and regulations concerning pollutant discharge into rivers, the condition of rivers has not improved over the years. Due to a lack of treatment capacity, a major portion of the effluent is being discharged into rivers without treatment. The existing treatment plants often do not work as per design due to lack of operation and maintenance and other reasons. Lack of monitoring leads to rampant violation of discharge guidelines for both domestic and industrial effluents.

3. Present Model of Effluent Treatment

Treatment of sewage is the responsibility of Urban Local Bodies (ULBs). However, since most ULBs lack funds for sewage treatment, Central and State Governments pay the capital cost and initial O&M costs for sewage treatment plants (STPs). ULBs maintain and operate the assets thus created.

Treatment of industrial effluents is the responsibility of individual industries. In many cases the Central and State governments have subsidized the construction of common effluent treatment plants (CETP) for industrial clusters. Operation and Maintenance of CETPs is the responsibility of the constituent industries.

4. Critique of the Present Model of Effluent Treatment

It can be argued that the above model of effluent treatment is a failure. In practice, most ULBs lack resources, capacity and also the desire to maintain STPs. Hence many STPs constructed with Central and State funds are working at sub-optimal levels or are defunct. Furthermore, due to various reasons, many industries and CETPs continue to discharge untreated or partially treated effluents into rivers.

Poor enforcement of relevant rules and regulations for effluent discharge into rivers result in such violations being the norm rather than exception. Also, punishment/penalty for violation of the associated norms must be strictly enforced. The authorities charged with the above tasks, i.e., the State Pollution Control Boards (SPCBs) have been largely unsuccessful in effectively discharging this responsibility assigned to them.

Above deficiencies in the present model are systemic. This means that the deficiencies in the present model are not only due to lack of resources, rather it can be argued that these deficiencies will persist even if sufficient resources are made available.

5. The "Zero-Liquid-Discharge" Concept

It is proposed that ULBs of Class I towns and large/medium industries/industrial clusters be denied the right to discharge effluents into rivers. This regulation can be easily enforced, since no measurement of the pollution load/concentration in the discharge is required. In addition to SPCBs, non-governmental organizations (NGOs) and other civil society organizations (CSOs) can act as effective watchdogs to ensure that this regulation is not violated.

The effluent must instead be collected, treated to tertiary levels and reused/recycled for industrial, horticultural and non-potable commercial purposes. Any remaining effluent should be released into canals, natural/artificial lakes, ponds etc. and used for irrigation, rejuvenation of natural water bodies, incidental ground water recharge and other beneficial purposes.

6. Advantages of "Zero-Liquid-Discharge"

The advantages of a shift from the present model of effluent treatment to a "Zero-Liquid-Discharge" (ZLD) model are apparent.

- Monitoring of compliance with the ZLD model is easy, as any NGO, CSO or concerned citizen can

detect violations and report to the concerned authorities.

- Pollution load in the rivers will reduce, since ZLD implies complete cessation of pollutant discharge. This will directly lead towards attainment of the goal of "Nirmal Dhara" (un-polluted flow) in the rivers.
- Implementation of the ZLD concept will result in mandatory effluent reuse and recycling, effluent utilization for irrigation, rejuvenation of natural water bodies and incidental ground water recharge. This will reduce the pressure on fresh water resources, resulting in the release of more fresh water into rivers and thus indirectly lead to the goal of 'Environmental Flows or E-Flows' in the rivers.

Session : A3

December 3, 2012
16:00 – 17:30hrs

PPP in Wastewater Treatment, Reuse and Recycle

Session Chair	Session Moderator
Mr Vimal Yadav Mayor, Gurgaon	Mr Alok Brara Editor, Indian Infrastructure

Panelist

1. Ms Debashri Mukherjee, CEO, Delhi Jal Board
2. Mr Amanullah, CEO, SPML Utilities
3. MrPranab Kumar Majumdar, Additional General Manager, Va Tech, Wabag
4. Mr Sam Yamdagni, President, Xylem Water Solutions India Pvt Ltd

Setting the Scene: Dr Vinod Tare, Professor, IIT Kanpur [16:00 – 16:15]
Remarks by Panelists [16:15 – 17:00]
Discussion and Summary Remarks [17:00 – 17:20]
Address by Chair [17:20 – 17:30]

Discussion Points

1. Can we generate resources for sewage and industrial treatment without private investment?
2. Is there any risk in handing over sewage treatment to private investors?
3. Are there existing cases of sewage treatment with 100 % private investment?
4. Are there any takers of proposed PPP models?
5. What policy framework or guarantees are required for implementation of PPP in treatment, recycle and reuse of sewage and industrial effluents?
6. Can the PPP proposition work effectively without ZLD concept and/or without mandated recycle and reuse of treated water?

Proposition

1. Public-Private Partnership" (PPP) in Effluent Treatment

The implementation of the "Zero-Liquid-Discharge" (ZLD) concept in effluent treatment requires a complete overhaul in the Present Model for Effluent Treatment. It is proposed that the construction and operation of effluent treatment facilities should be entrusted by the client, i.e., the Urban Local Body (ULB) or industry/industry cluster whose effluent is being treated as per ZLD norms, to a 'service provider'. The 'service provider' will be paid for the services by the client in annuities over the concession period.

2. Salient Features of the Proposed PPP in Sewage and Effluent Treatment

Construction and operation of the effluent pumping and treatment infrastructure should be done in the PPP mode using a Design-Build-Finance-Operate (DBFO) model. Other essential components of the proposed DBFO model are the following,

- Scope of the effluent pumping and treatment infrastructure for producing effluent suitable for

reuse/recycle must be finalized, along with the plan for reuse/recycle or other uses of the treated effluent. As per ZLD norms, no discharge into rivers is allowed.

- The concession for the provision of effluent treatment services is given to a 'service provider' through competitive bidding.
- The land required for construction of the infrastructure is provided to the selected 'service provider' on lease over the concession period at nominal rates.
- The 'service provider' builds, and then maintains and operates the facility over the concession period.
- The client extends all help to the 'service provider' for commercial exploitation of resources generated through effluent treatment, i.e., treated water, sludge-derived products, etc. The accruals from such activities will be shared between the client and the 'service provider' as per terms specified in the concession agreement.
- The facility reverts back to the client at the end of the concession period unless the contract duration is extended.

3. Income to the 'Service Provider'

In the above model, the income to the 'service provider' will be from two sources,

- Annuity payments received by the 'service provider from the client. The expected amount of annual payments (for each year of operation after commissioning) will be clearly specified in the concession agreement. However, the actual annual payments shall be linked to the quantity of treated effluent (of specified quality) produced by the 'service provider' in that year.
- Accruals from commercial exploitation of resources generated through effluent treatment, as per provisions specified in the concession agreement.

4. Payment to the 'Service Provider'

In case an ULB is the client, funds will be made available to the ULB by the state and central governments for annual payment to the service provider throughout the concession period. Some mechanism must be put in place such that the service provider is assured of payment as per the contract. This kind of guarantee is necessary for raising funds from the market (loan component) of the initial capital investment by the 'service provider'. In case the client is an industry/industry cluster, the annuity payments will be made by the concerned industry/industry association.

Payments will be released to the 'service provider' only after verification that the essential contract terms regarding both quantity and quality of effluent treated and disposal of treatment residues are satisfied. Suitable penalty clauses will be included in the concession agreement in case of non-compliance by the 'service provider'.

5. Advantages of the Proposed Model

The model proposed above has been designed to overcome the drawbacks of the Present Model for Effluent Treatment. The advantages of the proposed model are as follows.

- Proper operation and maintenance of the effluent pumping and treatment infrastructure is assured over concession period. The 'service provider' will be interested in maintaining and operating the facilities throughout the concession period, because that is how the equity invested in the project by the 'service provider' may be recouped and profits made.
- Active participation of both the 'service provider' and the client (i.e., ULBs) for creation of a market for treated water and sludge-derived products obtained through effluent treatment is likely, since profits from sale of these products will be shared between the ULB and the 'service provider'.

- In cases where industry/industry cluster is the client, the treated water may be recycled in-house, thus reducing the fresh water requirement of the industry, thus ensuring water security of the industry.
- Commercial sale or in-house use of treated water will require the 'service provider' to exercise excellent quality control during the effluent treatment process such that high quality treated effluent is available at all times for sale/use. This is an additional check on the proper operation and maintenance of the effluent pumping and treatment infrastructure being operated by the 'service provider'.

6. "Zero-Liquid-Discharge" (ZLD) and Present Model of Effluent Treatment: Refer to Theme Proposition of Session A2.

It is proposed that no domestic sewage (untreated, partially treated, or fully treated) shall be discharged from Class I towns (population > 100,000) in Ganga Basin to any river, to drains ultimately discharging into rivers, or pumped to the subsurface.

It is also proposed that no effluent (untreated, partially treated, or fully treated) shall be discharged from large/medium industries and industrial clusters/parks in Ganga Basin to any river, to drains ultimately discharging into rivers, or pumped to the subsurface.

Treatment of sewage is the responsibility of Urban Local Bodies (ULBs). However, since most ULBs lack funds for sewage treatment, Central and State Governments pay the capital cost and initial O&M costs for sewage treatment plants (STPs). ULBs maintain and operate the assets thus created.

Treatment of industrial effluents is the responsibility of individual industries. In many cases the Central and State governments have subsidized the construction of common effluent treatment plants (CETP) for industrial clusters. Operation and Maintenance of CETPs is the responsibility of the constituent industries.

Session : A4

December 4, 2012
09:30 – 11:00 hrs

Challenges in Developing Hydropower Projects and Maintaining River Flows and River Bed Connectivity

Session Moderator
Dr Rajiv Sinha
Professor, IIT Kanpu

Panelist

1. Dr A K Gosain, Professor, IIT Delhi
2. Dr Bharat Jhunjhunwala, Former Professor, IIM Bangalore
3. Mr Himanshu Thakkar, Member, SANDRP
4. Mr Onkar N Bajpai, Consultant, Jay Pee Associates

Setting the Scene: Dr Rajiv Sinha, Professor, IIT Kanpur [09:30 – 09:45]
Remarks by Panelists [09:45 – 10:30]
Discussion [10:30 – 10:50]
Summary Remarks by the Moderator [10:50 – 11:00]

Discussion Points

1. Is there a trade-off between rivers and hydropower?
2. Are alternate hydropower projects feasible if tampering with the river system is to be avoided?
3. Can the damage to river systems through present practice of hydropower be internalized in project viability studies?
4. Is the proposition of minimum flows or even environmental flows without protecting river connectivity acceptable?

Proposition

River and river basin is lifeline of human civilization. Human civilization and rivers enjoy symbiotic relationship where their survival is dependent on respect and regard for nature's mandate. Though hydropower projects are generally considered as a 'clean' energy option but there lies enormous challenges in developing such projects without causing significant damage to the river health. The major thrust of the discussion is to explore the possibility of harnessing hydropower potential making sure that the river health is not compromised. In long term rivers are more important than short-term gains to meet the current societal requirements. The challenge for the hydropower developers is to bring in innovative concepts such that tampering with the river systems is negligible or minimal and benefits of projects are assessed through internalization of the adverse impacts rather than just limiting to some remedial actions and offering compensation to some affected people. The big question is what kind of hydropower systems should be developed without substantially altering the river systems taking note of the concerns outlined as follows.

1. Issues with Current Practice of Hydropower Projects

The general perception is that the impacts of the hydropower projects are limited to interruption of longitudinal connectivity of the river for fish fauna and reduced water flows in the bypassed stretch.

However, the ground reality is that the impacts are much wider which can be broadly categorized into two major groups: (a) Impacts due to structures built in the riverbed or in the riparian zone, and (b) operational variables, such as released flow regime and sediment dynamics.

The general meaning of 'connectivity' is the property or degree of being connected or interconnected and this generally refers to computing capacity for interconnection of systems. In the context of river systems, we define three types of connectivity (a) geomorphic, (b) hydrologic and (c) ecologic connectivity. The geomorphic connectivity refers to the way in which landscape compartments fit together in a catchment, for example, a hillslope and channel. Hydrological connectivity refers towater mediated transfer of matter, energy and organisms within or between elements of the hydrologic cycle and this is typically understood in terms of longitudinal, lateral and vertical connectivity. Ecological connectivity of a river system is defined as the connectedness of ecological processes at multiple scales.

Some of the specific impacts of the hydropower projects may include:

- Physical alteration of habitats upstream of a barrier (from running to standing waters, that can lead to the reduction or disappearance of rheophilic species, and the colonization by lentic ones).
- Morphological alteration downstream due to lack of coarser sediment load that is trapped in the reservoir.
- Direct damage to fauna during reservoir or sediment traps flushing.
- Water quality changes and colonisation by invasive species due to artificial connection of different watersheds.
- Habitat and species alteration caused by 'hydropeaking' as well as the less known impacts of 'thermopeaking'.

Specific ecosystem impacts caused by a single hydroelectric project largely depend on the following variables: a) the size and flow rate of the river or tributary where the project is located, b) the climatic and habitat conditions that exist, c) the type, size, design, and operation of the project, and d) whether cumulative impacts occur because the project is located upstream or downstream of other projects. In general, the following impacts on the ecosystem have been commonly observed:

(a) Reservoirs and Stratification: It is commonly observed that water velocity slows down upstream of the reservoir. Surface 'slack' water becomes warmer and colder water sinks to the bottom resulting in 'stratification' of the reservoir water. The bottom water also gets depleted on oxygen and adversely affects the fauna.

(b) Supersaturation: Water spilling over dams is exposed to air for much longer duration and gets enriched in nitrogen. The excess nitrogen can enter into the tissues of fish and can cause serious injury and even death.

(c) Sedimentation upstream: The reaches of the river upstream of the dams commonly suffer from aggradation which results into nutrient loading and overpopulation leading to oxygen depletion. On the other hand, the downstream reaches suffer from lack of nutrients as alargeproportion of sand grade material is trapped upstream. This again affects the fauna adversely.

(d) Changing Water Levels: Storage projects typically raise water levels upstream resulting in inundation of banks and riparian zones. Further, drastic change in habitat condition result due to severe modifications in the morphology. Eventually, a new equilibrium sets in but this is commonly accompanied by significant changes in species. A more serious problem is 'power peaking' which means rise and fall of the level of water in a reservoir on a daily, weekly or seasonal basis to produce

electricity as per the demand. As a result, in a riparian zone, (the area where moist soils and plants exist next to a body of water) the shoreline vegetation is not effectively reestablished.

(e) Erosion: Changing water levels and a lack of streamside vegetation can also lead to increased erosion. For example, the lack of vegetation along the shoreline means that a river or reservoir can start cutting deeply into its banks. This can result in further changes to a riparian zone and the species which it can support. Increase in erosion can also increase the amount of sedimentation behind a dam.

2. Mitigation Measures of Hydropower Projects

While it is understood that the demands of the society would necessitate some hydropower projects but it is necessary that all such projects have enough measures so as not to damage the river health in the long run. Some of the possible mitigation and restoration measures adopted around the world include:

- Implementation and monitoring of changes in the released flow so as to mimic the natural flow of the river. This is important for the flows throughout the year and not limited to minimum flow conditions.
- Adoption of correct protocols for the mobilization of sediments so as not to allow major morphological modifications and preservation of physical habitats.
- Installation of screens at the inlets and of fish-friendly turbines to help the migration of fishes upstream and downstream for spawning and swimming in different seasons. Construction of fish passes at several installations has proved to be very effective.
- Restoration measures may include morphological restoration including river widening or diversification and/or increase/decrease of sediment input, improvement of shoreline and in-stream habitat conditions, creation of new habitats in the surrounding areas, and reintroduction of indigenous fish fauna.

Session : A5

December 4, 2012
11:15 – 12:45 hrs

Comprehensive Legislation on River Basins

Session Moderator
Dr Indrajit Dube
Professor, IIT Kharagpur

Panelist

4. Dr Uday Shankar, Professor, IIT Kharagpur
5. Dr M C Mehta, Founder, M C Mehta Environmental Foundation, New Delhi
6. Dr Rajendra Singh, Tarun Bharat Sangh, Alwar, Rajasthan
7. Swami Chinmayanand, Ram Ashram, Yamuna Nagar, Haryana
8. Justice A K Ganguly, Former Judge, Kolkata

Setting the Scene: Dr Vinod Tare, Professor, IIT Kanpur [11:15 – 11:25]
Remarks by Panelists [11:25 – 12:10]
Discussion [12:10 – 12:30]
Summary Remarks by the Moderator [12:30 – 12:45]

Discussion Points

- Need of a Comprehensive Legislation
- Constitutional Mandate- the Centre- State Power
- The Proposed Legislative Frame and Outreach
- Nature of National River Ganga Basin Authority and Autonomy
- Preventive and Precautionary Action
- Nature of Liability and Ensuring Compliance of Order

Proposition

1. Desirability of a Comprehensive Legislation on Management of National River Ganga Basin

River and river basin is lifeline of human civilization. Human civilization and rivers enjoy symbiotic relationship where their survival is dependent on respect and regard for nature's mandate. Any ignorance or attack on nature's mandate sweeps away the civilization. The Prime Minster has declared river Ganga as the National River of India on November 5, 2008. River Ganga and many other rivers of the Ganga River Basin have been subject matter of debate and deliberations due to deteriorating condition of most of the rivers. River Ganga and many other sacred rivers in the Ganga River Basin have been reduced to drains carrying sewage and industrial effluents at many places which warrant immediate remedial action.

Water is a prime resource for sustaining life on earth. The domestic, agricultural and industrial uses of water are multiplying day by day and this phenomenal increase in demand for water in diverse fields has resulted in its scarcity. Moreover, availability of water is highly uneven in both space and time as it is dependent upon varying seasons of rainfall and capacity of storage. India is served by two great river

systems, i.e. the Great Himalayan Drainage system and the peninsular river network. It has 14 major rivers that are inter-State rivers and 44 medium rivers of which 9 are inter-State rivers. Eighty five per cent of the Indian land mass lies within its major and medium inter-State rivers.

River Ganga does not only sustain life and livelihood of millions but also symbolizes growth of mankind in this country. The deteriorating condition of the river Ganga presses the need of enactment of comprehensive law on conservation and development of the National River Ganga Basin. The incremental rise in pollution of water has been causing existential threat to the river.

For over three decades the States have raised objections to any formula evolved by the Centre for the sharing of the waters of an interstate river and integrated development of a river, and the Centre has not been strong enough to overcome their objections. The result has been that India has failed to develop its water resources through integrated river basin development and conflicts over rivers between States have become common. It is not that the Constitution has no provisions enabling the Union to regulate the development and regulation of interstate rivers in the public interest. The Constitution gives full control over waters of a river to a State (List II entry 17) but the States' rights are made subject to any law made by Parliament for the regulation and development of interstate rivers to the extent the control of the Union is declared by Parliament by law to be expedient in the public interest (List I entry 56). This means that in the national interest, Parliament can make a law taking over the regulation, development and management of an interstate river for the common benefit of the States.

This subject matter in the entry reflects coverage of all subject matter which is worsening the condition of Ganga River Basin. The condition precedent to enacting of law is the existence of the public interest. The prevailing condition of the river Ganga does not only warrant immediate attention of law-makers but also any delay will cause irreparable loss to the lifeline of civilization.

It is important to locate subject matters in List II which may be seen as conflict with entry 56 of List I. Entry 17 of List II states that "Water, that is to say, water supplies, irrigation and canals, drainage and embankment, water storage and water power subject to the provisions of Entry 56 of List I." Entry 14 of List II relates to agriculture.

2. Provisions for Enacting Laws in the Constitution

The Indian Constitution satisfies elementary condition of federal characteristics of constitution whereby division of powers between the centre and the states are explicitly scripted in Part XI of the Constitution. Chapter I of Part XI of the Constitution provides for distribution of legislative powers between centre and states. Chapter I read with Schedule VII indicates the subject matters on which the centre or the states or both may enact law. Generally, the subject matters pertaining to national importance are placed in List I whereas the matters of local importance are placed in List II. Subject matter which requires uniformity at the national level as well as accommodation of local interest in enacting process is placed in List III.

Article 246 (1) confers exclusive jurisdiction on the centre to enact law on the subject matters enlisted in List I whereas clause 2 of Article 246 grants such exclusivity to the states to enact law on the subject matters enlisted in List II. Article 246 (1) reads as "Notwithstanding anything in clauses (2) and (3), Parliament has exclusive power to make laws with respect to any of the matters enumerated in List I in the Seventh Schedule (in this Constitution referred to as the "Union List").

Entry 56 of List I provides for "regulation and development of inter-state river and river valleys to the extent to which such regulation and development under the control of Union is declared by Parliament by law to be expedient in the public interest."

In furtherance of Article 246 (1) read with entry 56, the River Board Act, 1956 was enacted to promote integrated and optimum development of waters of inter-state rivers and river valleys. This Act contemplated the appointment of river boards by the central government in consultation with the state governments. It was expected that these boards would help in optimum utilization of river waters and promote development of irrigation, drainage, and water supply.

3. Legislative Competence to Enact a Law on Management of National River Ganga Basin

A closer analysis of the aforesaid entries clarifies that the matter of regulation and development of Interstate River may not be in conflict with the legislative power of the states if the law refrains from impinging on the matters within competence of the state legislatures.

It is apt to highlight that the proposed law shall deal with conservation and development of the Ganga River Basin. The proposed law will not in any manner encroach upon the competence of the state legislatures. However, it is established principles that incidental encroachment of the subject matter does not vire the law.

Unfortunately, the Central government has failed to take optimal benefit of this provision of the Constitution. Entry 56 read with Article 246 confers necessary power on Parliament to make law to address the pressing problems of the Ganga River Basin.

4. Note on Mapping of the Legislations

The gaps in provisions of various legislations enacted by the centre and states have been traced relating to the subjects on water, sanitation, irrigation, agriculture, pollution, fishing, ecology and biodiversity, environment, rivers, river basins, etc.

On analysis of the legislations, it can be concluded that there are some questions with regard to the efficacy of the divergent laws in conservation and development of river basins in general, Ganga River Basin in particular.

Under most of the legislations, the Authorities perform the necessary functions stated under the law, but interestingly no authorities are entitled to play a role in prevention of river pollution. The concerns which arise after analysing the Authorities are:

- The efficacy of the Authorities and effectiveness of legislations;
- Their role in handling social, economical and technical matters pertaining to river Ganga.

5. About the New Legislation

It is imperative that a new legislation may be designed exclusively for the river Ganga, as a National River. It is desirable to adopt an integrated river basin management plan approach that focuses on maintenance and restoration of wholesomeness of rivers of the Ganga basin. Accordingly, the proposed Ganga River Basin Management Act should aim to prohibit and regulate activities that directly or indirectly affect the wholesomeness of the rivers and establish authorities or institutions to regulate the activities thereon.

Session : A6

December 4, 2012
14:00 – 15:30 hrs

Cost of Water and Pricing for Industrial, Commercial and Horticulture Uses

Session Chair	Session Moderator
Mr Brijesh Sikka	Mr Subramaniam
Advisor, MOEF, GOI	Editor, Everything About Water

Panelist

1. Mr O P Oberoi, DGM, NTPC
2. Dr Sandeep Aslokar, MD, SFC
3. Mr J S Kamoyatra, Member Secretary, CPCB
4. Mr Mahender Singh, Chief Engineer, Delhi Jal Board
5. Dr Onkar Mittal, President- Society for Action in Community Health (SACH)

Setting the Scene: Dr Vinod Tare, Professor, IIT Kanpur [14:00 – 14:15]
Remarks by Panelists [14:15 – 15:00]
Discussion and Summary Remarks [15:00 – 15:20]
Address by Chair [15:20 – 15:30]

Discussion Points

- How to arrive at true cost of water?
- At present how much is paid for different uses of water?
- If we do not invest and pay for pollution of surface and sub-surface water, how much is the additional burden on health issues and/or bottled water or house hold level treatment for potable water?
- What pricing framework is needed for effective implementation of both Zero Liquid Discharge and Public-Private Partnership models?
- Is treatment of sewage and industrial effluents to a higher degree (tertiary and higher) more economical in long-term in terms of water, food and health security?

Proposition

Irrespective of who bears the cost, expenditure incurred on transporting water from its source to the user end, and altering the water quality for the designated beneficial use (referred as cost of water supply) has to be met. Similarly, expenditure incurred on transporting the sewage from its point of generation to the ultimate disposal or point of use (in case of reuse and recycle), and altering the characteristics to meet the effluent discharge limits or satisfy the specific use requirements (referred as cost of wastewater disposal) has to be met. This total expenditure on water supply and wastewater, is referred herein as cost of water. Directly or indirectly this cost gets charged to the people, though may not be in an equitable manner. In addition to this cost, environmental cost due to adverse impacts on natural resources has also to be accounted. The total cost in this anthropogenic transfer and transport of water from one place to the other is rarely realized. For optimal utilization of available water in sustained manner it is absolutely essential that this total cost is properly accounted for, and priced equitably. This principle should be followed in evolving strategy and plan for developing water sector.

We believe that "polluter pays principle" should be applied in its true spirit and in case of joint responsibility, cost should be shared on equitable basis. The application of Zero Liquid Discharge (ZLD) paradigm internalizes the cost of polluting water bodies and mandates application of "polluter pays principle". At this stage we are looking at developing appropriate pricing mechanisms for meeting the water requirements for industrial, commercial and horticulture uses in urban centers based on realization of total cost. Such costs can be easily computed if ZLD concept is effected and reuse and recycle is mandated. The pricing for water taken from fresh water sources should be typically higher than the cost for reuse and recycle of treated wastewater. It is only then cost of polluting water bodies would be internalized and automatically innovation and modernization will bring in efficiency in water use.

Session : A7

December 4, 2012
15:45 – 17:15 hrs

Future of Water in 21st Century Cities

Session Chair	Session Moderator
Mr V P Baligarh, CMD, HUDCO	Mr Monish Verma, EBTC

Panelist

1. Mr Rishabh Sethi, COO and ED, SPML
2. Mr Jacques Manem, CEO, SUEZ Environment, India
3. Mr Amitabh Kant, CEO, DMICDC
4. Mr Patrick Rousseau, Veolia Water, India Head

Setting the Scene: Mr Osten Ekengren, IVL, Sweden [15:45 – 16:00]
Remarks by Panelists [16:00 – 16:20]
Discussion and Summary Remarks [16:20 – 17:00]
Address by Chair [17:00 – 17:15]

Discussion Points

1. Rapid urbanization is putting a lot of stress on water resources. How are global 21st century cities going to cope?
2. Is strict regulation the only way forward?
3. Lessons from around the world
4. How innovation in water sector can help make this dream a reality?
5. Implementing Smart Grid

Proposition

It is estimated that in another decade or so 50% of India will live in urban centres. Indian cities are already bursting at the seams. Recent liberalisation of land usage means that many of the cities will go vertical and develop high-rise buildings putting even greater demand on water resources. As urban population grows, the Urban Local Bodies (ULB) will face multiple challenges – issue of providing 24x7 water; managing irregular settlements; managing wastewater being discharged into the sewer network and directly into watershed. These issues have to be managed through efficiency in the immediate terms and progressive regulations and new technological advancements in the imminent future.

It is estimated that there is nearly 50% leakage in the piped water network in urban cities. Whilst the irregular settlements also tap into the piped water which results in revenue losses, it is the efficiency gains within the network that will be one of the major sources of water supply. Just 10% efficiency gains can dramatically increase the water coverage by population or by number of hours. Positive impact will be felt with energy savings.

Urban development policy framework must also put water as a fundamental subject in addition to land and energy related guidelines. During construction of large townships, developers should not use

fresh water or ground water. Regulations should facilitate use of treated sewage water and ULBs should facilitate Private-to-Private structures whereby capital investment into sewage treatment can be done by a third party and the treated water off-taker can be a group of developers. The same model can be further extended to other major users of water such as Railways, Horticultural, Recreational and Industrial clusters. This would help create a market and pricing benchmarks of water.

Within a built-complex regulations to recycle wastewater must be adhered to strictly. Further techniques to conserve water using water-harvesting; efficient pipes/valves and taps can be brought in.

These regulations are fairly well understood by various ULBs but it is the enforcement of such frameworks and models that is a real challenge. The Government must focus on creating a market based instrument such as water quality trading and water conservation credits. These instruments work on similar lines to Renewable Energy Certificates and Energy Efficiency Certificates. A market based financial incentive will drive large scale adoption of water efficiency and recycling mechanisms.

India in the coming decade will also develop many new class I and II cities. It is a golden opportunity for the country to adopt efficient water management practices by using major technological advances.

The smart grid network can deliver to Urban Local Bodies real time demand management both at the consumer level as well as at the resource/basin level.

There is a growing movement world-over to bundle utility services to households particularly for the last mile connectivity. Gas, Power, Water and Telecom (fibre) going into the households should be managed by one entity. There could be many such entities at local or national scale that manage such a network. This would improve customer services, increase revenue collection and bring down the disruption time and costs for operations and maintenance.

Track B
Solutions: Science, Technology and Engineering

Track B: Solutions: Science, Technology and Engineering

Availability of land, energy and finances are the major constraints in building and operating infrastructure for conyeance, treatment, reuse-recycle and disposal of sewage and industrial effluents. Sewage and industrial effluents can be typically viewed as suspensions and /or solutions of sugar (organics) and salts in water. The ideal treatment objectives are thus essentially separation of the three components (organics, salts and water) to an extent that all three can be used effectively without significantly modifying the carbon, nutrent, salt and hydrological cycle. Typically carbon and nutrients (nitrogen, phosphorous, potassium and other minrtals) should be diverted to the soil, salts should not be allowed to accumulate in the terrestrial environment, and net storage of surface and sub-surface must attain dynamic equilibrium. The focus of presentations and discussions in this track of the Summit is to review and gather latest concepts and technology innovations in three broad categories as follows.

1. State-of-the-art in Sewerage Systems

The concept of reuse and recycle is becoming essential to maintain and restore rivers and other water bodies, and getting widely accepted. It is thus imperative that emphasis would be on decentralized systems, intercepting sewers, small size low depth sewers, pressurised conveyance systems, more number of small capacity compact sewage treatment plants (STP), multi tier STPs, STPs that recover energy from waste/sludges and have net less energy consumption, etc.

2. Industrial Effluents

Industrial effluents, though approximately one third in terms of quantity in comparison to the sewage, contribute similar order of magnitude of organic load and pose much greater challenge in terms of fixed dissolved solids and specific pollutants. The adverse impacts on the rivers and other water bodies, including ground water, is much higher due to the fact that these are mostly concentrated in few pockets. Recovery of resources from industrial effluents is more challenging than that from sewage.

Four major categories of industrial effluents in the Ganga River Basin that produce liquid wastes are tanneries, textiles, sugar and distilleries, and pulp and paper. While major portion of the organic content can be managed relatively easily, the challenge is posed by the presence of higher concentrations of fixed dissolved soilds and some specific pollutants (e.g. chromium, dyes, etc.). From the perspective of managing pollution of rivers and other water bodies, it has become essential that by and large reuse and recycle of water is mandated to the industries and adopt the Zero Liquid Discharge paradigm. Specifically, attention is needed for less energy intensive options for managing fixed dissolved solids using combination of concentratin and drying (including solar drying), storage during dry seasons, and flushing during wet (rainy) season.

3. Managing Water and Sanitation in Rural and Distributed Environment

Water supply and sanitation in the rural and distributed environment (isolated pockets and peri-urban areas) pose altogether different kind of challenges. In water supply to the rural areas and many of peri urban areas, the issue is of specific contaminants such as arsenic, fluoride, iron, nitrates or contamination of subsurface waters by sewage and industrial effluents. While several techniques have been developed over past 3-4 decades for removal of arsenic and fluoride, implementation of these has been far from satisfactory. In fact, increasing stress is given now on finding alternate sources of water (rain water harvesting structures for drinking water, bottled water, etc.). Trade off between the two approaches, and workable strategies and solutions need to discussed and recommended.

Strategies for managing sanitation issues in rural and distributed environment also have to be different from those used in urban areas. Innovative toilet designs, separation of black and gray water, onsite treatment, decentralized solutions, drainage and conveyance of water/sewage, application of pond and wet-land based systems, etc. are some of the issues that need to be discussed to arrive at appropriate strategy and technological solutions.

The sessions on above themes will have invited speakers presenting novel concepts, ideas, experiences and case studies from across the globe, on the issues and concernes outlined as above, followed by discussion and recommendations.

Session: B1 – B2

December 3, 2012
11:45 – 13:30 hrs
14:00 – 15:45 hrs

State-of-the-art: Sewerage Systems

Session Moderator
Dr Ligy Philip
Professor, IIT Madras

Issues

1. Network Redesign & Efficiency
2. Decentralization
3. Financing
4. Novel Technologies for Secondary Treatment
5. Novel Technologies for Tertiary Treatment
6. Managing Total Dissolved Solids (TDS)
7. Energy from sewage – is it viable?

Speakers

1. Mr Sanjoy Mukherjee, EIL
2. Mr Indra M Mitra, Vice-President, World Water Works (USA)
3. Dr Elzbieta Plaza, Professor, Royal Inst of Technology, Sweeden
4. Mr Rajendra Joshi, Xylem
5. Dr Mervyn Goronszy, Bisasco Pty Ltd., Australia
6. Mr M Natarajan, Chief Manager (Environment Protection), CPCL
7. Mr Rahul Sonawane, General Manager, Xylem
8. Mr V Subramanian, Executive Engineer, CMWSSB, Chennai

Discussions

Summary by the Moderator

Session : B3 – B5

December 3, 2012
16:00 – 17:45 hrs

December 4, 2012
09:30 – 11:30 hrs
11:45 – 13:15 hrs

Management of Industrial Effluents
Tannery, Textile, Sugar & Distillery and Pulp & Paper

Session Moderators
Dr Shyam Asolekar
Professor, IIT Bombay
Mohd. Jawed
Professor, IIT Guwahati

Issues

1. Tackling Chromium and Colour
2. Removal of organics
3. Management of Salts/Fixed Dissolved Solids
4. Zero Liquid Discharge and Recycling

Speakers

1. Dr Pontus Schwalbe, Globe Water
2. Dr S Sundarmoorthy, Advisor MoUD
3. Mr Amit Bansal, Johnson Matthey
4. Dr Anupama Kumar, CSIRO, Australia
5. Dr Ulla Chowdhury, Aqueau Q, Sweened
6. Mr Rahul Sonawane, General Manager, Xylem
7. Dr I Sajid Hussain, Tamil Nadu Water Investment Company
8. Mr Ajit Vidyrthi, Sr Environmental Engineer, CPCB

Discussions

Summary by the Moderator

Session : B6

December 4, 2012
14:00 – 16:00 hrs

Managing Water and Sanitation in Rural and Distributed Environment

Session Moderator
Dr A A Kazmi
Associate Professor, IIT Roorkee

Issues

1. Technologies for Removal of specific contaminants: Arsenic, Fluoride and TDS
2. Alternative ways of Water Supply
3. Decentralised / onsite wastewater management

Speakers

1. Dr Anirban Gupta, Professor, BESU,Shibpur, West Bengal
2. Dr Markus Starkl, BOKU University, Austria
3. Dr Ligy Philips, IIT Madras
4. Dr Jyrkil Laitinen, Finnish Environment Institute SYKE
5. Dr Yatinder Suri, Outokumpu

Discussions

Summary by the Moderator

India Water Impact Summit (IWIS) - 2012

Track C
Specialist Roundtables

Session : C1

December 3, 2012
15:45 – 17:00 hrs

Imagining Water: Understanding the Political Economy of South Asia's Rivers

Coordinators
Dr Gareth Price, Chatham House
Mr Samir Saran, Observer Research Foundation

Issues

1. Regional Issues around water
2. Attitudes of different stakeholders towards water
3. Chatham House/Observer Research Foundation programme on understanding the political economy of South Asia's rivers

Session : C2

December 4, 2012
10:00 – 11:30 hrs

Structuring CSR-related initiatives in water (and waste water) to make maximal impacts

Coordinator
Mr Monish Verma, EBTC

Backdrop

Experiences from Europe on water related corporate social responsibility activity.

Session : C3

December 4, 2012
11:45 – 13:15 hrs

Canada – India: Collaboration in Water Sector

Session Moderator
Harjeet Bajaj, President, CTBF

Backdrop

1. A curtain-raiser on Canada's expertise in the water sector
2. How Canada has managed to develop a world class water focused eco-system
3. Why India is an interesting market for Canadian water focused companies?

India Water Impact Summit (IWIS) - 2012

Training Workshop and Field Visits

Session : D1

December 5, 2012
10:00 – 14:00 hrs

Training Workshop
Managing Water Resources for the 21st Century

Coordinators
Mr Sanmit Ahuja, ETI Dynamics

Overview
The training workshop on Managing Water Resources for 21st Century mainly focus on new trends and challenges in the industry. This workshop provides a platform for experts and professionals involved in water resources management to exchange knowledge, experiences and gain an insight into the state of the art in current technology, techniques and solutions in managing water resources as they havebeen developed and applied in different countries.

Objective
- To discuss the development in the management of water resources in the country
- To discuss the wastewater treatment and water management with the participants
- To provide participants with the principles, tools and methodologies of integrated water related management resources, monitoring and assessment

Keynote Speakers
Dr Brent Wootton
Director, Centre for Alternative Wastewater Treatment, Canada
Dr Wendy Mortimer
Manager-Training, Ontario Clean Water Agency, Canada
Dr Raja Venkataramani
Adjunct Professor, EMPI B-School, New Delhi
Country Manager, GHK Development Consultants, India
Dr Kiran Kumar Avadhanula
Senior Consultant, GHK Development Consultants, India

Registration
There is no cost to participate in the Training Workshop but registrations are required to book your place. Registration can be carried out on the below link: http://www.eventbrite.com/event/4930323731

For additional queries please
Send an email to kanika.chawla@empi.ac.in
Or call +91 9650816838

Duration: 10:00 to 13:00 hrs followed by Lunch
Venue: R&D Centre, EMPI B-School, Campus P.O.: CSKM Educational Complex Satbari, Chattarpur, New Delhi – 110 074

Session : D2

December 5, 2012
11:00 – 13:00 hrs

Field Visit

Coordinators
Mr Sanmit Ahuja, ETI Dynamics

Field visit to

Delhi Jal Board's Rithala Wastewater Treatment Plant

Please contact

Mr Dinesh Kumar for registering your interest
Email: dinesh.kumar@xyleminc.com +91 98108 39650

Field visit to

33 MLD Sewage Treatment Plant based on SBR technology at Sector 54, Noida

Please contact

Mr Saurabh Shukla for registering your interest
Email: sshukla@iitk.ac.in +91 945571 7353

India Water Impact Summit 2012

Chief Guest

Mr Akhilesh Yadav
Chief Minister, Uttar Pradesh

Inaugural Session

Mr Montek S Ahluwalia
Deputy Chairman
Planning Commission, India

Prof. M Anandakrishnan
Chairman
Board of Governors, IIT Kanpur

Mr Pekka Voutilainen,
Ambassador
Finland

Dr S N Singh
Deputy Director
IIT Delhi

Dr Vinod Tare
Summit Chair and Professor
IIT Kanpur

Mr Sanmit Ahuja
Summit Co Chair and CEO
ETI Dynamics, UK

Special Session: Water Innovation in India

Mr N Vittal
Chairman, Vittal Innovation City

Prof Indranil Manna
Director, IIT Kanpur

Mr Amitabh Kant
CEO, DMICDC

Mr Ajai Chowdhry
Founder and Ex-Chairman, HCL

Dr Brent Wootton
Chair, Ontario Water Technology
Acceleration Programme

India Water Impact Summit 2012

Session Chairs and Panelist

Session A1: Managing Water Requirement for Nature and Development

Swami Avimukteshwaranandah Saraswatee
Ganga Seva Abhiyanam

Ms Bahar Dutt
CNN-IBN

Mr Anupam Mishra
Gandhi Peace Foundation

Dr Sejal Worah
WWF-India

Dr Uday G Kelkar
NJS Consultants Co

Mr P K Jain
Technical Advisor PHE, Meinhardt India Pvt Ltd

Shri Paritosh Tyagi
Former Chairman, CPCB

Dr Brij Gopal
Centre for Inland Waters in SA

Session A2: Bringing Zero Liquid Discharge Concept

Mr Rajiv Sharma
Mission Director, NMCG, MoEF

Mr Sam Yamdagni
MD, Xylem Water Solutions India

Dr Dhinadhayalan
Dy Advisor, MoUD

Dr Suresh K Rohilla
Programme Director, CSE

Dr Indra M Mitra
Vice-President, World Water Works (USA)

Sri S Venkataramana
Director (Operations), CPCL

India Water Impact Summit 2012

Session Chairs and Panelist

Session A3: PPP in Wastewater Treatment, Reuse and Recycle

Mr Vimal Yadav
Mayor, Gurgaon

Mr Alok Brara
CEO & Publisher, India Infrastructure

Ms Debashree Mukherjee
CEO, Delhi Jal Board

Mr Amanullah
CEO, SPML Utilities

Mr Pranab Kumar Majumdar
AGM, Va Tech Wabag, Chennai

Mr K Sudhakar
Municipal Commissioner, Guntur

Session A4: Challenges in Developing Hydropower Projects and Maintaining River Flows and River Bed Connectivity

Mr Harish Rawat
Minister, Water Resources, India

Dr Rajiv Sinha
Professor, IIT Kanpur

Dr A K Gosain
Professor, IIT Delhi

Dr Bharat Jhunjhunwala
Former Professor
IIM Bangalore

Mr Himanshu Thakkar
South Asia Network on Dams, Rivers & People (SANDRP)

Mr O N Bajpai
Consultant
Jay Pee Associates

India Water Impact Summit 2012

Session Chairs and Panelist

Session A5: Comprehensive Legislation on River Basins

Justice A K Ganguly
Former Judge

Dr Indrajit Dube
Professor
IIT Kharagpur

Dr Uday Shankar
Professor
IIT Kharagpur

Dr M C Mehta
Founder, MCMEF, New Delhi

Mr Rajindra Singh
Chairman, TBS, Alwar, Rajasthan

Session A6: Cost of Water and Pricing for Industrial, Commercial and Horticulture Uses

Dr Sandeep Aslokar
Managing Director, SFC

Dr Onkar Mittal
President- Society for Action in Community Health (SACH)

Mr J S Kamoyatra
Member Secretary, CPCB

Mr O P Oberoi
DGM, NTPC

Mr Mahender Singh
Chief Engineer, Delhi Jal Board

Session A7: Future of Water in 21st Century Cities

Mr Monish Verma
EBTC, EU

Mr Rishabh Sethi
COO and ED, SPML

Mr Jacques Manem
CEO, SUEZ Environment, India

Mr Patrick Rousseau
Veolia Water, India Head

India Water Impact Summit 2012

Managing Ganga and Other Water Bodies
3-5 December 2012, India Habitat Centre, Lodhi Road, New Delhi, India

Session B1 – B2: State-of-the-art Sewerage Systems

Moderator: Dr Ligy Philip, Professor, IIT Madras

Dr Mervyn Goronszy
Bisasco Pty Ltd., Australia

Mr Sanjoy Mukherjee
EIL

Dr Elzbieta Plaza
Professor, Royal Inst of Technology, Sweden

Mr Rajendra Joshi
Xylem

Mr Rahul Sonawane
General Manager, Xylem

Mr V Subramanian
Executive Engineer, CMWSSB, Chennai

Session B3 – B5: Management of Industrial Effluents

Moderator: Dr Shyam Asolekar, Professor, IIT Bombay
Dr Mond Jawed, Professor, IIT Guwahati

Dr Pontus Schwalbe
Globe Water

Dr S Sundarmoorthy
Advisor, MoUD

Mr SatyaNarayana YVV
SFC Environmental Technologies Pvt. Ltd.

Dr Mond Jawed
Professor, IIT Guwahati

Dr Anupama Kumar
CSIRO, Australia

Mr I SajidHussain
Tamil Nadu Water Investment Company

Dr Shyam Asolekar
Professor, IIT Bombay

Dr Amit Bansal
Johnson Matthey

Ms Ulla Chowdhury
Aqua-Q, Sweeden

Mr Ajit Vidyarthi
Sr Environmental Engineer, CPCB

India Water Impact Summit 2012

Managing Ganga and Other Water Bodies
3-5 December 2012, India Habitat Centre, Lodhi Road, New Delhi, India

Session B6: Managing Water and Sanitation in Rural and Distributed Environment

Moderator: Dr A A Kazmi, Associate Professor, IIT Roorkee

Dr Anirban Gupta
BESUS, West Bengal

Dr Ligy Philips
IIT Madras

Dr Markus Starkl
BOKU University, Austria

Mr Yatinder Suri
Outokumpu

Ms Jyrkil Laitinen
Finnish Environment Institute SYKE