



## Name of the Report: Indian Water & Wastewater Sector – Opportunities for U.S. Companies

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### 1. Summary of the Sector

India is home to 16 percent of the world's population, but has only 4 percent of world's water resources. There are 465 cities and towns with populations of over 100,000 and 53 urban areas have populations of over 1 million. The population density in these cities is also very high. Altogether, 161 million people live in these "million plus" cities. Water is a key resource and also a major component of waste in all these cities.

The four major issues India faces are:

- Declining availability
- Increasing demand
- Declining water quality
- Inadequate infrastructure

**Declining availability** – The United Nations describe an area as "water stressed" when annual water supplies drop below 1,700 cubic meters per person. By this definition, India is already a water-stressed nation. The per capita availability of water dropped significantly from 1,816 cubic meters in 2001 to 1,545 cubic meters in 2011. When annual water supplies drop below 1,000 cubic meters per person, the population is said to be facing "water scarcity". With a further reduction in per capita availability of water, India will soon be a "water scarce" nation. In 2013, India's Water Resources Minister stated that, 'By 2050, the per capita availability of water will further decrease to 1,140 cubic meters.'

**Increasing Demand**- According to Ernst & Young's Water Report, India's annual water consumption is approximately 581 billion cubic meters (BCM). Irrigation needs account

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for 89 percent of consumption. Domestic consumption is approximately at five percent and industries account for six percent. The report indicates that the demand for water is going to grow by 2.4 times and the volume of sewage will increase 2.3 times between 2007 and 2030. The report also estimates that the demand for domestic water will grow from 34 to 66 BCM. Industry's demand will increase from 41 to 92 BCM, and, demand for water for irrigation will expand from 606 to 674 BCM between 2010 till 2030. India currently has the highest rate of ground water extraction amongst the G20 countries. India's rate is more than twice that of China, which is the second highest. There is no proper accounting for the extent of groundwater extraction by private citizens, industries and urban local bodies. This has led to a drastic fall in groundwater levels in several regions of India. Urban water bodies are disappearing at an alarming rate as a result of real estate projects. India's Planning Commission estimates that only 50% of the demand for water will be met by 2030.

**Declining water quality-** The water quality management in India is governed by the provisions of Water (Prevention and Control of Pollution) Act, 1974. India's Central Pollution Control Board monitors water quality in India through an extensive network of 2,500 monitoring stations spread across the country; covering 445 rivers, 154 lakes, 41 creeks, 25 canals, 10 water treatment plants, 807 groundwater stations and other water bodies. Each water sample is analyzed for 9 core parameters and 19 general parameters, as well as for trace metals at a few locations. The list of parameters, along with state-wise report status is provided in the CPCB Water Quality Status Report link cited in reference. According to the summary assessment of the same report, results obtained since 1995 indicate that the organic and bacterial contamination are critically high in water bodies. This is mainly due to the discharge of untreated domestic wastewater from the cities which cannot be adequately diluted in the receiving water bodies. Therefore, oxygen demand and bacterial pollution are both increasing steadily. Other trends pointing towards over-extraction and consequent deteriorating water quality are: growing inland salinity in arid and semi-arid area states; coastal salinity; high fluoride (> 1.5 mg/liter) in 19 states; high Aarsenic (> 0.05 mg/liter) in five states; high concentration of iron (>1.0 mg/liter) in more than 100,000 habitations; high nitrate (>45 mg/liter) in most hydrogeological formations and the presence of toxic metals in some rivers. The desirable standard for water quality for various end-uses is specified in:

<http://wqaa.gov.in/WriteReadData/UserFiles/Documents/WaterQualityStandards.pdf>

**Inadequate infrastructure of water supply and wastewater treatment-** According to data used by India's Planning Commission in 2012, 38,254 million liters per day (MLD) of wastewater is generated in 921 cities and towns having population of more than 50,000. The municipal wastewater treatment capacity developed so far is only 11,788 mld, or 31 per cent of what is generated. The remaining untreated sewage is the main cause of pollution in rivers and lakes. The Central Pollution Control Board reports that, although there are 269 sewage treatment plants in India, only 231 are operational. The majority of the sewage treatment capacity exists in the metropolitan cities. While accounting for 40

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per cent of all wastewater generated, these cities have some 70 per cent of the installed capacity. According to India's Planning Commission Report of the Working Group on Urban and Industrial Water Supply and Sanitation for the 12th Five Year Plan (2012-2017), as much as 40-50 per cent of the supplied water is 'lost' in the distribution system. As referenced above under "Increasing Demand", city authorities have no records of the amount of groundwater which is privately extracted in the city through private wells or supplied through tankers. Most Indian cities have a massive backlog of incomplete sewage systems or systems in serious need for refurbishment and repair. The Expert Committee Report on Indian Urban Infrastructure and Services estimates the annual per capita investment needed for capital infrastructure in the water, sewerage and storm-water sector at \$233 and another \$14 for operation and maintenance. According to this estimate, the total capital investment needed is \$126 billion in the next 20 years.

## 2. Government Policy

The Ministry of Environment & Forests (MoEF) is the nodal agency in Government of India for implementation of environment policies. The water quality management in India is governed by the provisions of Water (Prevention and Control of Pollution) Act, 1974. India's Central Pollution Control Board (CPCB) monitors water quality in India through an extensive network of 2,500 monitoring stations spread across the country; covering 445 rivers, 154 lakes, 41 creeks, 25 canals, 10 water treatment plants, 807 groundwater stations and other water bodies. Each water sample is analyzed for 9 core parameters and 19 general parameters, as well as for trace metals at a few locations. Although industries use only six percent of water consumed in the country, this is the most regulated form of water pollution. CPCB has specified industry-specific standards, as per Environment Protection Rules, 1986, as specified in [http://www.cpcb.nic.in/Industry\\_Specific\\_Standards.php](http://www.cpcb.nic.in/Industry_Specific_Standards.php) The CPCB lists 17 categories of highly polluting industries and 85 red category industries based on pollution impact (details are available at [http://mpcb.gov.in/consentmgt/Catagorylist\\_Red.php](http://mpcb.gov.in/consentmgt/Catagorylist_Red.php)).

The other Government agencies which play a key role in relation to urban/rural water supply and wastewater management projects are Ministry of Drinking Water & Sanitation (<http://www.mdws.gov.in/>) and Ministry of Urban Development (<http://moud.gov.in/>). Contact details of senior officials of each Ministry is provided in the respective websites.

## 3. Current Market Size & Trends

<i>(In Millions)</i>	2013	2014	2015 <i>(estimated)</i>
<i>Total Market Size</i>	2106	2211	2322
<i>Total Local Production</i>	1534	1611	1691
<i>Total Exports</i>	338	355	373
<i>Total Imports</i>	910	956	1003
<i>Imports from the U.S.</i>	286	300	315
<i>Exchange Rate: 1 USD=</i> <i>61 INR</i>			

*Figures are approximate; based on estimates provided in 2013 Environmental Technologies Resource Guide published by the U.S. Commercial Service for U.S. exporters, and assuming that water & wastewater management sub-sector is 26 percent of the overall environmental goods and services sector. In 2014 & 2015, the market has been projected to grow at 5 percent y-o-y.*

Taxes and duties for import of various components and categories of water and wastewater plant and equipment can be obtained using the Customs Duty Calculator of the <https://www.icegate.gov.in/Webappl/>

#### 4. Market Entry & Opportunities

Water and wastewater is the most promising sub-sector in India's environmental segment. The sector is expected to grow at a compounded rate of 13-15 percent over the next five years. Procurement is almost equally split between government and the private sector projects. However, sales to the industrial sector are growing at a higher rate because the government is primarily involved in treatment of raw water, water transmission and distribution and sewage treatment operations. According to an Ernst & Young (E&Y) report titled "Water Sector in India- Emerging Investment Opportunities", there are four key themes to be addressed in the government sector: water demand management; water supply management; water infrastructure upgrade, and water utilities management. The E&Y report further quantifies some of the important opportunities under the following four themes:

- Metering, instrumentation, equipment supply for managing water demand;
- Involvement in Public Private Partnership (PPP) model with the state utilities for water supply and distribution;
- Setting up of water treatment and desalination plants, and
- Involvement in water engineering-procurement-construction, or EPC, which entails providing integrated water resource management solutions for utilities

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On the industrial front, the power, food and beverage, pharmaceuticals, refineries and textiles sectors are generating immense opportunities for water and wastewater treatment equipment. These industries prefer advanced treatment technological systems such as reverse osmosis (RO) membranes for treating their wastewater. The water treatment market is gradually shifting from chemical treatment and demineralization plants to membrane technology. The concept of wastewater recycling and zero discharge systems is becoming more widely accepted as new technologies such as sequencing batch reactor (SBR) and membrane bioreactor (MBR) based treatment gain in popularity.

Many international water companies have set up offices in India or are operating through local partnerships. The indigenous development of various treatment components such as resins, membranes and vessels have reduced costs and made various technologies available on a mass-scale. The companies offering water technology and services can be divided into three categories:

- Large companies- like VA Tech Wabag, Degremont, IVRCL (with Hindustan Dorr-Oliver as its subsidiary), Paramount, Ion Exchange, Thermax;
- Medium-sized companies- like Doshion, Aquatech, Fontus Water, Driplex, TEAM, Ions Hydro
- Small companies, 500 or more, most of which are system integrators.

In India, most projects are publicly funded and the capital belongs to the water utility. The private sector brings in managerial expertise. Several large projects with private sector participation are listed in the Planning Commission Report cited in this report under References.

**Cost of water treatment-** According to a Planning Commission document, the basis for calculation for the average cost of a water treatment plant is the technology used and the quality of intake water. This actual cost is said to range from \$0.03-0.17 million/MLD. By comparison, the average cost of a sewage treatment project, complete with collection network and treatment plant, is \$0.55 million per MLD. One of the most expensive water supply projects is in Agra, where the polluted Yamuna River needed a capital investment of \$0.17/MLD. The operating cost was calculated as 8 cents/kiloliter.

**Industrial wastewater-** The major industries causing water pollution include distilleries, sugar, textile, electroplating, pesticides, pharmaceuticals, pulp and paper mills, tanneries, dyes and dye intermediates, petrochemicals, steel plants. The six most water-intensive industries are power, pulp and paper, iron & steel, fertilizer, cement, aluminum. Industries depend primarily on surface water (41 percent) to meet their needs, followed by groundwater (35 percent) and municipal water (24 percent). Concern regarding the availability and price of water is driving industries to treat and re-use wastewater to achieve better water efficiency. Adoption of membrane systems is rising fast. Large

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industries are undertaking water audits and 'water returns' are the annual reports filed by corporations. The reports include parameters such as water utilization per unit of production, effluent discharge details, rainwater harvested, water reuse details and fresh water consumption.

**Water Project Financing-** Public water infrastructure faces a major financing gap. According to India's Planning Commission, the total capital investment required for upgrading India's water infrastructure is \$126 billion over the next 20 years. The Jawaharlal Nehru National Urban Renewal Mission (JNNURM) of Government of India remains the largest source of financing for water supply and sewage treatment projects. Since its inception in 2005, JNNURM has financed 166 water supply projects and 115 sewage projects for an estimated cost of \$6 billion: <http://jnnurm.nic.in/wp-content/uploads/2013/11/Sectorwise1.pdf>.

JNNURM was launched by the Government of India in 2006 to provide opportunities for state agencies to create water and wastewater infrastructure. According to information on its website, JNNURM financial assistance is available to urban local bodies as a 100 percent grant from the Government of India to the implementing agencies for specific project proposals. JNNURM has played a critical role by providing much needed public funding to build and refurbish assets. Under JNNURM, the bulk of the projects have been for water and sewerage. Examples of current projects funded by JNNURM includes: one 24X7 water supply system for Surat and three water recycling and reuse plants of capacity 60 MLD each for Ahmedabad to treat sewage up to the tertiary level. It was approved for funding by Government of India with a total estimated investment \$58.5 million. Work is to be completed within 24 months, ending in February 2016:

<http://pib.nic.in/newsite/PrintRelease.aspx?relid=104192>;

It is important to note that U.S. companies must work with urban authorities and Indian project developers to have their product/design specifications included in a project proposal submitted to Government of India for funding through mechanisms like the JNNURM. A list of Indian and international consultants recognized by the Ministry of Urban Development, Government of India for the JNNURM projects is available at [www.urbanindia.nic.in/programme/ud/consultants.htm](http://www.urbanindia.nic.in/programme/ud/consultants.htm).

Additionally, U.S. companies are advised to track the World Bank/ADB/Japan Bank websites and publications for International Cooperation (JBIC) soft loan and grant funded projects in the water sector. These projects offer significant front-end consulting opportunities and the possibility to supply equipment during the project implementation phase.

## 5. Barriers

The barriers for U.S. companies in India's water and wastewater sector are the following:

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- Extreme price sensitiveness of Indian buyers, particularly the government procurements which are open tender based and generally predisposed to the lowest bidder. U.S. firms provide excellent technology but often find difficult to offer Indian level price
  - The U.S. dollar has gotten stronger against the Rupee in recent months, making imports less attractive
  - Strong base of indigenous manufacturers and local consultants, offering competition
  - Import options from cheaper sources
  - European companies are well entrenched in the market
  - The business cycle for government procurement is much longer compared to U.S. standards
  - Higher cost of doing business in India

## 6. Competition in the Market

Private sector plays a large part in the construction, operation and maintenance of water systems. Several projects in Public-Private-Partnership mode have been executed and are in pipeline. The Indian water treatment equipment industry is reasonably well established and cost competitive. The number of specialized water and wastewater management and equipment supplier companies has been growing steadily over the last decade.

Some leading international water sector companies operating in India are:

- Veolia Water, France
- Suez Environment (and Degremont- subsidiary), France
- VA Tech Wabag, Austria
- Thames Water, United Kingdom
- GE Water, USA
- Dow Chemicals, USA
- Dupont, USA
- Grundfos Pumps, Denmark
- KSB Pumps, Germany
- Nalco Chemicals, USA
- Drewtreat Chemicals, USA
- Krohne Marshall, Germany
- Endress + Hauser, Germany
- Emerson (Fisher Rosemount), USA
- Koch Group, USA
- Hydranautics, US A
- Pentair Group, USA

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- Schlumberger / Actaris, France
  - Amiantit, Saudi Arabia
  - Netzsch, Germany
  - George Fischer
  - Aplaco, Saudi Arabia
  - Metrohm, Switzerland

## 7. Success Stories

Several leading American companies such as GE, CH2M Hill, Bechtel, Parsons Brinckerhoff, Weston Solutions, Pentair Water, NLC Nalco are pursuing India market opportunities through their have local offices and are members of the American Chamber of Commerce in India.

## 8. Trade Events / Associations

The Commercial Service environment team in India sent high caliber delegations to WEFTEC in 2012 and 2013. In 2014, recruitment is again planned for the event being held in New Orleans, September 27 – October 1. Showtime meetings are arranged with U.S. exhibitors interested in learning more about the Indian market for their products and services.

Among the trade shows held in India, there are number of shows for exporters to consider. The Commercial Service industry specialist in each regional office either visits or actively supports the show, depending on the timing of the announcement of the event and other factors. The following is a list of shows for consideration.

The annual IFAT event organized by Messe München is a very good option for suppliers of a wide range of environmental technologies and services, including water and sewage treatment. According to the end-of-show report, the first IFAT India held in Mumbai in October 2013 was a success. One hundred thirty one companies from 17 countries exhibited (including several from the U.S.). Five thousand trade visitors attended. The next event is scheduled for Oct. 9-11, 2014, in Mumbai. For details, please visit [www.ifat-india.com/](http://www.ifat-india.com/).

Aquatech India will be held in New Delhi, May 6-8, 2014. The show aims to put up a high- quality international-standard event. The exhibition will display the latest products and innovations in process, drinking and waste water. Details are available at <http://www.aquatechtrade.com/india/Pages/homepage.aspx>. Although CS India is not directly involved in promoting the event, a number of American suppliers have participated in the past. However, since the date of the event coincides with India's national election process. As a result, attendee participation may be impacted to a degree.

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CHEMTECH Foundation will organize WaterEx World Expo in Mumbai, January 28-31, 2015 - (<http://www.chemtech-online.com/events/waterex/>). This is expected to be a large, water-focused event. CS India has not participated in this event in the recent past.

Two other Indian trade shows previously supported by CS India in the past are EverythingAboutWater Expo (<http://www.eawater.com/expo/>) and Water Today Expo (<http://waterexpo.biz/>). Both events were held in January 2014 and each is likely to be held around the same time in 2015 (dates not announced).

## 9. Useful Web Links

Report of the Planning Commission Working Group on Urban and Industrial Water Supply and Sanitation for 12th Five Year Plan (2012-2017):

[http://planningcommission.nic.in/aboutus/committee/wrkgrp12/wr/wg\\_indu\\_sani.pdf](http://planningcommission.nic.in/aboutus/committee/wrkgrp12/wr/wg_indu_sani.pdf)

U.S. Department of Commerce Environment Technologies Export Market Plan for India:

[http://export.gov/%5C/static/India%20EnvTech%20export%20plan%202013\\_Latest\\_eg\\_mai\\_n\\_067303.pdf](http://export.gov/%5C/static/India%20EnvTech%20export%20plan%202013_Latest_eg_mai_n_067303.pdf)

Ernst & Young Water Sector Report on India:

[http://www.ey.com/Publication/vwLUAssets/Water\\_sector\\_in\\_India/\\$FILE/Water\\_Sector\\_in\\_India.pdf](http://www.ey.com/Publication/vwLUAssets/Water_sector_in_India/$FILE/Water_Sector_in_India.pdf)

Central Pollution Control Board report on status of water treatment plants in India:

[http://www.cpcb.nic.in/upload/NewItems/NewItem\\_103\\_statusofwaterqualitypackage.pdf](http://www.cpcb.nic.in/upload/NewItems/NewItem_103_statusofwaterqualitypackage.pdf)

Central Pollution Control Board report on status of water quality in India:

[http://www.cpcb.nic.in/upload/NewItems/NewItem\\_193\\_WaterQuality2011.pdf](http://www.cpcb.nic.in/upload/NewItems/NewItem_193_WaterQuality2011.pdf)

Municipal water treatment (technologies used):

[http://www.urbanindia.nic.in/programme/uwss/uiww/PPT\\_3rd\\_Meeting/CII\\_Water\\_Technology\\_PPT\\_Rreview.pdf](http://www.urbanindia.nic.in/programme/uwss/uiww/PPT_3rd_Meeting/CII_Water_Technology_PPT_Rreview.pdf)

Market research reports published by private information service providers- such as "Water & Waste Water Sector in India- Evaluating Emerging Opportunities" along with a "Database of Existing and Upcoming Municipal and Industrial Projects" priced at \$1,300 ([www.snpinfrasol.com](http://www.snpinfrasol.com)) and "Database of Waste Water Projects in India (including

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Existing and Upcoming Municipal and Industrial Projects” priced at \$700  
([www.idatainsights.com](http://www.idatainsights.com))

Jawaharlal Nehru Urban Renewal Mission (JNNURM): <http://jnnurm.nic.in/>

Ministry of Environment and Forests: <http://www.envfor.nic.in>

Central Pollution Control Board: <http://www.cpcb.nic.in/>

Environmental Information System – ENVIS: India <http://envis.nic.in/>

Ministry of Urban Development: <http://moud.gov.in/urbanmorphology>

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