City Water & Waste Profiles

Agra, Uttar Pradesh

- **Money invested:** *Rs 77.75 crore under YAP (Sept 2005)*
- **Capacity created:** *90.25 mld (STPs)*
- **Untreated waste:** *104.75-206.75 mld (41-80 per cent of waste generated)*

Like most Indian cities, Agra metropolis is growing. The municipality, encompassing an area of 121.57 sq km had a population, as per 2001 census, of about 1.26 million. By 2005, this had grown to 1.43 million, with 2011 projected population estimated to touch 1.6 million. But Agra, designated as a world heritage site, faces a number of challenges in terms of water, sewerage and financing municipal works. There is a bursting strain on the infrastructure and services, both from its own population and from the regular onslaught of visiting tourists, estimated at 1.80 million every year.

In the city, Agra Jal Sansthan (AJS) is in charge of operation and maintenance, and revenue collection in supplying water, while all capital works related to water supply and sanitation are undertaken by Agra Jal Nigam (AJN).

Monitoring
The NRCD monitors the river at two places in Agra — upstream at Poiaghat, (182 km from Okhla barrage towards Dayalbagh) and downstream behind the Taj Mahal 192 km from the Okhla barrage.

State of the river
The two agencies monitoring water quality in Agra, the NRCD and the Agra Jal Sansthan (AJS) do not seem to agree upon anything. NRCD's water quality monitoring data shows high levels of DO in the Agra stretch during 1996-2005, when the annual average DO level upstream of Agra increased from 10.65 mg/l to 11.60 mg/l.

At the same time data show that DO levels have also increased to 6.30 mg/l from 1.65 mg/l at the monitoring point downstream of Agra during 1996-2005. So after receiving the city's treated, untreated and partially treated waste, the DO data, without conviction deems the river water suitable for bathing. NRCD argues that the DO levels have risen due to its efforts to clean up the river but the water supply board of Agra — AJS — constantly complains that the water quality in the river at the water supply intake is deteriorating.

The AJS says that DO levels touch zero several times in the year.43 In a presentation on the Upper Ganga Water Supply scheme to supply drinking water to Agra, the UPJN agrees with AJS and points out that minimum DO levels observed at the AJS waterworks intake are always less than the 4-mg/l level specified for a drinking water source after conventional treatment.

Water supply
According to the AJS, the total water demand of the city is 320 million litres per day (mld), which includes the demand for bulk supply, estimated at 75 mld. The water demand as estimated for the 1.42 million-population in 2005 was 245 mld, which was calculated on a 170 litres per capita daily (lpcd) standard. For this, the city has two water treatment plants with a capacity to treat 410 mld in entirety

Waste generation
According to CPCB's *Status of sewage treatment in India* report of February 2006, the city generated 211 mld sewage in 2001. This is based on a sewage generation factor of 168 lpcd (or a

210 lpcd water supply).

UPJN estimates show that the water demand has shot up from 284 mld to 320 mld leading to an increased wastewater discharge. But how much is actually used is unknown. UPJN while reviewing YAP has estimated the wastewater discharge in 2003 to be 152.15 mld. This assumes the water supply to be 107 lpcd. This is far lower that the water supply estimates provided by AJS. R P S Sanghu, chief chemist AJS says, “Per capita water supply is set at 135 lpcd.” This difference in data will definitely affect the waste planning for the city.

The most recent estimates, however, have been collated by CPCB in its 2005-06 annual report stating the flow in all drains to be 254 mld. This points to a 100 mld rise in waste water generated over since UPJN’s last estimate 3 years back.

Expenditure on river clean-up

A comprehensive plan was prepared originally for Agra in 1917 at an estimated cost of Rs 50 lakh. This included sewerage and stormwater drainage, but following a funds crunch it was never implemented. In 1945, this scheme was revised for laying intercepting drains and sewers at an estimated cost of Rs 23.32 lakh.

However, it was only to be again revised in 1962 for construction of branch sewers in the catchment of the main sewers (Mantola, Civil Line, Dholikhar, Mathura road, Bhairon nala, Strand Road, Jama Masjid and Old Chhata sewers) at an estimated cost of Rs 16.77 lakh.

Besides the numerous schemes and projects to improve sewerage the government of India supported Agra with funds under YAP. However, this accounts for just 14.5 per cent of the funds required for Agra’s huge hardware plan. Till 2005, Agra received Rs 77.75 crore under YAP. Another Rs 87.26 crore has already been approved for the city under YAP-II

TABLE 4.18: Investment to collect and treat sewage in Agra

Capital investment to clean Yamuna	Rs crore
1962 sewerage scheme	0.167
Agra branch sewer scheme	0.10
YAP-I (spent in Agra)	69.91
YAP extended (in Agra)	7.84
Tajganj sewerage scheme	43.57
JNNURM sewerage	763.13
JNNURM drainage	168.44
YAP-II allocated	87.26
Total	1140.42

Note: Under YAP-II Rs 85.64 crore is for sewerage; Rs 13 crore for YAP-III project preparation in eight towns

Sources:

1. Anon 2005, ‘MIS report of programmes under National River Conservation plan, Vol II, MoEF, New Delhi, *mimeo*
2. Anon 2002, ‘Agra sewerage master plan’, NEERI, Nagpur, *mimeo*

Sewage treatment capacity

Three STPs with a combined capacity of 90.25 mld have been set-up under YAP. While 78 mld (Dhandupura) and 2.25 mld (Burhi ka nagla) facilities were set-up to deal with waste of Cis Yamuna, a solitary 10 mld STP was set-up at Peela Khar to deal with the waste of trans-yamuna.

The sewage network has been expanded to feed them, but the infrastructure remains inadequate and the river remains dirty. Agra's sewerage system is in shambles. Spread over 1,400 ha it is devoid of proper connections with most sewage flowing into open drains. While the system is largely silted several lines remain choked and damaged at a number of places. This has made the disposal of sewage into nalas (open drains) a common affair. For example, the sewage arriving at Dhandupura STP is partly from the small population connected to the sewerage system, with the rest arriving from the 17 intercepted open drains. On the other hand, incoming sewage at Burhi ka Nagla and Peela Khar STP arrives from intercepted open drains. Notably, a major part of Agra, 8,300 ha remains unsewered.

Future plans

Now, Rs 124.13 crore has been sanctioned under YAP-II for UP and Agra seems to be benefiting the most. The focus is on laying 41-km of sewers in the western districts along with a 40 mld STP at Bijpuri and 33-km sewer in the northern district with a 14-mld STP at Dayalbagh. However, the southern and eastern districts have been completely ignored. I N Tyagi, project manager Yamuna pollution control unit, UPJN Agra says: "Besides repairing the existing sewage systems promoting citizen's participation have been envisaged." According to YAP-II Agra should have an additional capacity of 54 mld enabling the city to treat 144.25 mld of its waste by 2009. But as per 2006 waste generation estimates this will still be inadequate.

Under JNNURM the CDP of Agra has set aside more money for sewerage. Rs 763.13 crore out of Rs 7,854.64 crore has been allotted for laying new sewer lines, STPs and SPS. Statistically speaking, this shall result in the creation of 1,028 km of sewer lines, 264 mld treatment capacity, and 19 major and 36 minor pumping stations. If this plan is implemented within the set time frame, Agra will have a sufficient treatment capacity, and as a result lesser pollution loads will be discharged into the river. However, until then the river will have to linger for respite while Agra plans to go through with stopgap measures such as the Ganga jal project.