

SHAJAPUR SEWERAGE SUBPROJECT IN DISTRICT SHAJAPUR OF MADHYA PRDESH

Introduction:

1. Madhya Pradesh (MP) is geographically the second largest, fifth populous and eighth most urbanized state in India. Its total urban population is 20.1 million, which is 28 per cent of the total population spread over 476 urban centres.
2. Rapid urbanization in Madhya Pradesh has seen sprouting of new urban settlements across the state, mainly close to the existing cities. The last decade (2001-2011) has seen a 20% increase in the number of urban centres, including a 50% increase in census towns, compared to a 6% increase in previous decade (1991-2001).
3. Government of Madhya Pradesh in its Vision Document 2018 has shown their determination to face the challenges of urbanization and accordingly, has undertaken many programs to support the urban infrastructure. Madhya Pradesh Urban Development Project (MPUDP) is one of them which envisage financial support from the World Bank for various sub projects of Water Supply and Waste Water Management.

Sub Project Description

4. Shajapur is a district headquarter and a city among the important cities of Western Madhya Pradesh. It is situated 60 Km from Dewas on National Highway No. 3 (Agra-Mumbai Road), 180 km from Bhopal – the State Capital in the south East and 95 km from Indore in the south West. Shajapur geographically lies at Latitudes 23°25” North and Longitude 75°25” East, 435 meters above mean Sea Level. The city is situated on the banks of Chillar River.
5. A drinking water supply project @135 Lpcd (Litre per capita per day) has been executed under Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT), a part of Jawahar Lal Nehru National Urban Renewal Mission (JnNURM). The installed capacity for Water Treatment is 15.00 MLD. A project to augment intake infrastructure is also being implemented and is likely to be completed by the end of December 2018. The Shajapur Nagar Palika (Shajapur Municipal Council- SNP) is also taking up a drive to ensure 100% coverage with individual connections. This will definitely add to increase in waste water generation which is being disposed in River Chillar through various small and major drains of the city. River Chillar (a tributary of River Chambal) flows through the middle of the town and disposal of waste water in the river does not only contaminate the ground water but also creating an unhygienic and polluted environment in the city. Being a major source of pollution to River Chillar, it is envisaged to treat the sewage of the town and hence, a sewerage project has been prepared for the urban population living in the Municipal Council jurisdiction. The intent of the project is to ensure a comprehensive, technically and financially viable system for sewage collection and treatment for Shajapur town.
6. The project has been designed as de-centralized system, dividing the whole town into two Sewage Treatment Plants (STPs). Intermediate pumping is provided in some region wherever essential for the economics of the design of proposed sewerage system. For sewage collection, the entire area under the Municipal Boundary, after considering various options based on the topography and physical barriers (river Chillar and railway line divide the town into two parts), has been divided

in to two zones: 1.) smaller zone with packaged STP of capacity 0.15 MLD; and 2.) Main Township with STP of capacity 11.10 MLD. The Projected Design population of the Urban Local Body (ULB) in the year 2049 is 119576. The Proposed project is designed to collect the sewage water from individual houses and carry it to the STP for providing desired treatment and finally, some portion of it to be reused for the purpose of horticulture, fire fighting, washing of ghats, flushing during initial years etc.; After reuse remaining treated sewage will be discharged into the river. Main Sewerage treatment plant (STP) is proposed to be based on extended aeration Process of Sequential Batch Reactor (SBR) Technology. The STP technology is being selected primarily taking into consideration the less land requirement and effluent characteristics as per Ministry of Environment and Forest and Climate Change (MOEF&CC), so that treated water can be discharged into inland water ways which are being potential drinking water sources. The total estimated cost of Shajapur Sewerage Project is about Rs.63.85 million.

7. The proposed Shajapur Sewerage Project is one of the sub-projects under MPUDP. The major components of this sub-project include: (i) STP-1 of 11.10 MLD (for the year 2034) based on SBR technology (though the Bidding will be on open technology) and one Packaged STP -2 of 0.15 MLD (iii) five intermediate pumping stations (IPS) (IPS 1- 2.90MLD, IPS 2- 0.70MLD, IPS 3- 2.50MLD, IPS 4 – 0.80MLD and IPS 5- 0.15MLD) which will pump the sewage to STP 1, (iv) Conventional Sewer network of 70.899 km length comprising of 150mm to 400mm dia Double Walled Corrugated (DWC) pipe (67.965 km length), 450 to 800mm dia Reinforced Cement Concrete Non Pressure - 3 pipe (2.492 km) and Ductile Iron (DI) K-7 pumping mains of dia 150 to 400mm (0.442km) ; (v) Small Bore Solid Free System (SBSFS) of total length 33.594 km; (vi) 28.36km long Rider Mains of DWC Pipe of dia 150mm; (vii) 2860 circular type main holes having size of 900/1200/1500mm bottom diameter and 560mm top diameter for conventional sewer system and 1060 circular manholes having size of 900/1200 mm bottom diameter and 560 mm top diameter for small bore sewer system (viii) 4167 brick masonry house chambers having size of 600mm x 450 mm & 900mm deep.
8. The project proposes to lay sewer pipelines within the Right of Way (RoW) of the existing roads by using open trenching methodology, however, the location of the pipe may be in the center or left or right of the RoW as this will vary with the alignment. The general width of the trench would vary from 50 cm to 1.75 m. Approximately 50% of the excavated material will be reused in back filling of the trenches. Remaining 50% will be transported to fill low lying area. No blasting is required.
9. The land parcels selected for all the components, except for the two Intermediate Pumps (IPS), are Government lands. Two IPS are proposed on Private land each needing 50 square metre (sqm). However, since land owners of both the land parcels have agreed to sell the land to the Urban Local Body (ULB) for construction of IPS through mutual consent and hence, any private land acquisition is not required. It is envisaged to adopt SBR technology for treatment of sewage to meet the standards set by MPUDC (given in annexure 5) which are more stringent than those prescribed by MoEF&CC in its notification released in October 2017 (for treated effluent to be released in surface streams).
10. The land parcel selected for main STP has to total land availability of 3.02 hectare out of which 1.50 hectare is reserved for STP against a requirement of 1.0 hectare only. The site for construction of STP is proposed near the banks of river Chillar in ward no. 8. The treated effluent will be disposed in River Chillar at near Badshahi Bridge through an outfall sewer of length 100m appx.

Environmental and Social Assessment

11. This report presents an Environmental and Social Assessment (ESA) of Shajapur Sewerage subproject under MPUDP. The assessment is carried out based on review of available secondary information, community and stakeholders consultations, field visits and primary environmental monitoring surveys. The assessment identifies potential impacts on the natural environment and the social characters of the subproject region during pre-construction, construction and operation phase of the sub project.
12. Various environmental factors such as the presence of eco-sensitive region in and around the project area, clearance of tree cover, improper storage of excavation spoils, flooding of adjacent areas, elevated noise and dust levels, damage to existing utilities were analysed for impact assessment of the project. As -per the Environmental and Social Management (ESMF) Framework of MPUDP and considering the nature of activities that involve construction of treatment plant, outfall sewers, and construction of deep sewer lines in dense urban areas, the project has been categorized as E_a.
13. Based on the Social screening of the sub-project and the categorization criteria for sub-projects of MPUDP in the ESMF, the present sub project of Sewerage work of Shajapur town is a low impact category sub-project from social safeguards perspective. Land for the two STPs and three IPS are Government lands. Two IPs however are proposed on private lands, and this does not involve any acquisition process as the land owners have agreed for sale of land to the ULB through mutual consent. The subproject hence has been identified as a Category S_c from social safeguards perspective.
14. Since the private land under two IPS is being purchased by the ULB through mutual consent, therefore, Resettlement Action Plan is not required.
15. Where potential adverse effects are predicted, mitigation has been developed and its implementation is presented in the Environmental and Social Management Plan (ESMP) and Environmental Monitoring Plan (EMP) /Social Monitoring Plan (SMP).

Legal, Policy and Administrative Framework

16. Construction of sewage treatment plant does not attract Environmental Impact Assessment (EIA) requirements of Government of India (GoI) and does not require Environmental clearance from the Ministry of Environment, Forest and Climate Change (MoEF&CC) / State Environment Impact Assessment Authority (SEIAA). The following National and State level environmental and social Acts, laws and the Operational Policies of the World Bank will be applicable to the Shajapur Sewerage subproject:
 - i. Environment (Protection) Act, 1986: This is an umbrella Act of Government of India and will be applicable for the project.
 - ii. Water (Prevention and Control of Pollution) Act of 1974, Rules of 1975, and amendments: This Act/ rules will be applicable to the sub-project and the proposed sewage treatment plant will require 'Consent to Establish' and 'Operate' from the

Madhya Pradesh state pollution control board for the sewage treatment plant proposed through the project.

- iii. Air (Prevention and Control of Pollution) Act of 1981, Rules of 1982 and amendments: Requirements of this act/rule will be applicable both during construction and operation phase of the sub project, for various equipment/ vehicles used by the project.
- iv. Child Labour (Prohibition and Regulation) Act, 2000 shall be applicable
- v. The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (RTFCTLARR Act 2013): No land acquisition or resettlement impacts are anticipated for any of the proposed civil works for this sub project, hence this Act is not applicable to the proposed subproject.
- vi. The Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act, 2014: Requirements under this Act will be applicable during construction.
- vii. Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013.
- viii. Construction and demolition waste management Rules, 2016 and Guidelines On Environmental Management Of Construction & Demolition (C & D) Wastes (Prepared in compliance of Rule 10 sub-rule 1(a) of C & D Waste Management Rules, 2016)

17. The Project is financed by the World Bank and hence World Bank's environmental and social safeguards policies are also applicable to this Project. The applicability of OPs in line with project activities and project settings are:

- i. OP 4.01 Environmental Assessment: The OP 4.01 is applicable to the sub project.
- ii. OP/BP 4.12 Involuntary Resettlement: Since no involuntary resettlement is needed, the policy is not applicable, No separate RAP is prepared.
- iii. OP/BP 4.10 Indigenous People: No area of Shajapur falls in Schedule V area, as per Constitution of India. Hence, the policy does not applicable. No separate IPP is required
- iv. OP/BP 4.11 Physical Cultural Resources: While no cultural properties shall be impacted due to the project the policy will not be applicable to the sub-project and will involve addressing the issues arising due to 'chance find' if any cultural properties.
- v. OP / BP 7.50 World Bank Policy for Projects on International Waterways. The OP 7.50 is not applicable to the sub project.

Baseline Environment Profile

18. Environmental and Social Profile of the study area is assessed based on available secondary data on Physiographic, Topology, Climatic, water quality, Biological profile of Shajapur town. The flora and fauna identified in the study area are commonly found and not specific to the region. Also, there are no National Parks, Wild life sanctuaries, Bird sanctuaries within 10 Km radius of the project site. There are no rare and endangered species in the subproject area.

19. The climate of the town is tropical with an average maximum and minimum temperatures of 47°C and 7°C respectively. The average annual rainfall reported in Shajapur town is 835 mm.

20. The data on ambient air quality of Shajapur is not available as this town has not remained the subject of monitoring by the Madhya Pradesh Pollution Control Board (MPPCB) due to non-

availability of any major industries. Initial ambient air quality monitoring was conducted by the support agency appointed by MPUDC, so that the baseline air quality data is available before construction. The monitoring was done in April 2018. Three locations were selected, out of which, one was in the core city with dense population.

21. As per this survey, PM₁₀ was observed in the range of 44.74 to 62.45 ug/m³, PM_{2.5} was in of 25.12 to 34.96 ug/m³, SO_x was found to be in the range of 7.21 to 11.98 ug/m³ & NO_x was found to be in the range of 13.01 to 20.87 ug/m³. All the results are well within the National Ambient Air Quality Standards (NAAQS).
22. The noise level was ranging from 66.3dBA at day time and 38.8dBA at night time. The noise level during day time near Shajapur Nagar Palika office (66.3 dBA) and near the brick kiln (55.8 dBA) are slightly higher than the the permissible limits of 65 dBA and 55 dBA respectively whereas results during night time are well within the permissible limits of 45-55 dBA in night time, as prescribed by CPCB.
23. In terms of socio-economic profile, as per Census 2011 of India, Shajapur Municipal Council had a population of 69,263, out of which 35,623 were males and 33,640 females, respectively. The Children belonging to the age group of 0-6 yrs are 8570 which is 12.37 % of the total population of Shajapur ULB. The Sex Ratio i.e. number of females per 1000 males is 944 against the state average of 931. Moreover Sex Ratio among the children in Shajapur is about 920 as compared to Madhya Pradesh state of 918. Literacy rate in the city is 85.47% which is higher than that of the state average of 70.17%. In Shajapur, male literacy is around 91.61% while, female literacy rate is 79.00%. Scheduled Caste population comprises 14.02% whereas tribal population constitutes a mere 1.41% of the total population. Divided into 29 wards, the Shajapur Municipal Council (Nagar Palika) is spread over 17.19 sq km. The total households as per census 2011 are 13066. There is no important cultural and heritage resource notified by Archaeological Survey of India around the subproject area.

Assessment of Anticipated Impacts

24. The anticipated impacts and corresponding mitigation measures are analysed separately for the project influence area and general impacts related to the nature of sub-project. Based on the magnitude and significance of the project activities, the nature, duration and extent of impacts are assessed.
25. The overall impact of the project on the beneficiary communities and the environment is expected to be positive resulting in an improvement in the health and quality of life of the people in the subproject area. There are no environmental sensitive areas in the subproject area, therefore, no such permanently negative or adverse environmental impacts were identified. Shajapur does not fall under the Scheduled V area; therefore, preparation of separate IPMF is not required.
26. The STPs and three IPS under the proposed sub project have been planned to setup on Government land. There are no squatters or encroachers in and around the premises, who could get affected by the project. Two IPS are proposed on private land for which the ULB has already approached to the land owners and they have given their consent, thus, the land for these two IPS will be purchased by the ULB through mutual consent.

27. The Sewer line laying will cause temporary disruption to the local community in terms of traffic congestion, access to roads (especially in dense and commercial areas and narrow roads), shops and residences. It is found that the access to shops may be affected temporarily during the period of sewer laying in the main market of the town. This issue is proposed to be addressed by laying sewer lines in small stretches of 250 m and by providing appropriate access to the shops. In streets, the residents have built ramps over the drains to have a direct access to the road or pathway. During laying of pipelines within the RoW, such ramps may have to be demolished. The ESMP includes a provision of re-constructing these ramps and the same is also included in the Bid document.
28. Possible Environmental and Social Impacts during preconstruction, Construction and Operation Phases are identified and possible mitigations during these phases have been suggested. Some of the environmental and social impacts identified include 1) air pollution due to dust and noise pollution during construction, 2) disposal of waste generated due to excavation activities, 3) loss of vegetation (about 5-8 number of trees) at STP/SPS site and while laying sewer network (trees mainly of Babul- *Vachellia Nilotica*, Neem-*Azadirachta indica* along the alignment of network), 4) temporary loss of access to residents, due to laying of sewer network, 5) temporary disruption to traffic (for 2 to 3 days at each stretch) etc. Such impacts would be jointly verified during construction stage by the PIU and Design (review) Built Operate Contractors (D(R)BOC) and mitigation measures identified in the report will be implemented.
29. The analysis of Alternatives was carried out to find out an option with least socio-economic and environmental consequences. The option study was conducted on the basis of available resources specially the lands for different components, i.e. 2 STP and 5 IPS. A detailed analysis for the selection of sewage network system i.e. whether to adopt conventional approach or have Small Bore Solid Free System was conducted and finally it was decided to adopt a combination of both the systems so as to have a techno-economic solution. However, paucity of land in the developed town specially limited availability of government land, resulted in restricted alternatives. The site for STPs was selected based on the tail end of the network and availability of sufficient land. The land parcels available at the tail end of the network were mostly privately owned except for the site selected under the present proposal. Analysis for the technology for Sewage Treatment was also taken up based on the secondary data and the DPR proposes to adopt Sequential Batch Reactor (SBR), though the bid will be invited on “open technology basis”.

Stakeholders and Public Consultation

30. Stakeholders / Public consultation is very useful for gathering environmental data, understanding likely impacts, determining community and individual preferences, selecting project alternatives and designing viable and sustainable mitigation and compensation plans. Extensive public consultation meetings for the Shajapur Sewerage Scheme were carried out during the ESA study. The main objective for the consultation was to involve the community at the very early stage, so as to identify likely negative impacts and find ways to minimize negative impacts and enhance positive impacts of the project.
31. Public consultations, sensitization and inclusion meetings were held within the wards of the project area in July 2016, September 2016 and April 2018 with the help of respective local administration and the elected representatives. A total number of 12 meetings/public

consultations were held with community members. Representation of all categories and different income level groups in these meetings were also ensured. Key comments / concerns from consultations have been taken into consideration and suggested changes in the design and implementation activities. The key issues discussed during consultations included, absence of sewerage system leading to unhygienic conditions and pollution of river Chillar; resettlement or compensation in case of loss of property/income/ livelihood activities; house connection inside property; accessibility and difficulties during laying of sewer network; safety issues during excavation; use of existing Septic Tanks and connections modalities; grievance redressal.

Tribal and Vulnerable Population Identification and Assessment of Shajapur

32. The tribal population of Madhya Pradesh increased to 15,316,784 in 2011 from 12,233,474 in 2001. In Madhya Pradesh certain areas have been declared as scheduled area as Specified by the "Scheduled Areas under the fifth Schedule of Indian Constitutions".
33. Shajapur district and town does not find a place in the scheduled list. Shajapur town has only 1.41% Scheduled Tribe population as per 2011 census. However, Social Impact screening and assessment was done for tribal and vulnerable population in Shajapur and no negative impacts due to the project were identified on tribal people. On the basis of identification, social impact screening and assessment and prior informed consultations, it was found that these groups are not a distinct groups, and also do not have any separate cultural, economic, social, or political institutions. They are well versed with local Hindi language also. No negative impact assessed during the process, so no separate IPP/TVDP is prepared.

Environmental and Social Management Plan

34. **Environmental and Social Management Plan.** An environmental and social management plan (ESMP) has been developed with measures to mitigate all negative impacts. Locations and sitting of the proposed infrastructure were considered to further reduce impacts. These include (i) locating facilities on government-owned land to avoid the need for land acquisition and relocation of people; and (ii) laying of pipes within the RoW of main/access roads, to reduce acquisition of land and impacts on livelihoods specifically in densely populated areas of the town.
35. The ESMP includes mitigation measures such as (i) implementation of traffic management plan in coordination with local traffic police to minimize traffic impacts; (ii) awareness campaigns and consultations to inform residents and businesses of potential disturbances; (iii) provision of walkways and other suitable measures for crossing trenches to ensure access is not impeded; (iv) use of noise-dampening measures in areas with sensitive receptors such as hospitals, schools, places of worships and other silence-zones; (vi) use of dust-suppression methods such as watering and/or covering of stockpiles; and (vii) finding beneficial use of excavated materials to extent possible to reduce the quantity to be disposed . As for the O&M phase, facilities will need to be repaired from time to time, but environmental and social impacts will be much less than those of the construction period as

the work will be infrequent, affecting small areas only. The ESMP includes mitigation measures and monitoring plan to ensure compliance to environmental and social standards during O&M phase.

36. The ESMP will guide the environmentally-sound construction of the subproject and ensure efficient lines of communication between Madhya Pradesh Urban Development Company (MPUDC), project management unit (PMU), project implementing unit (PIU), consultants and contractors. The ESMP will (i) ensure that the activities are undertaken in a responsible non-detrimental manner; (ii) provide a pro-active, feasible and practical working tool to enable the measurement and monitoring of environmental and social performance on site; (iii) guide and control the implementation of findings and recommendations of the environmental and social assessment conducted for the subproject; (iv) detailed specific actions deemed necessary to assist in mitigating the environmental and social impact of the subproject; and (v) ensure that environment, health and safety guide lines of the GoI and World Bank are complied with. The ESMP includes a monitoring program to measure the environmental condition and effectiveness of implementation of the mitigation measures. It also includes observations on- and off-site, document checks, and interviews with workers and beneficiaries. The estimated cost of implementing ESMP measures is about INR. 3.92 Million.
37. This ESA will be verified by MPUDC through its PIUs based on the final design of the Design Review, Build and Operate (DRBO) Contractor and the relevant ESMP provisions will be updated to address the impacts due to the design changes (if any) during the construction phase. The updated ESA and ESMP will be shared with World Bank for necessary clearance and disclosure by MPUDC.

Monitoring and Evaluation

38. Urban Development and Housing Department (UDHD) of Government of Madhya Pradesh (GoMP) is the Executing Agency for MPUDP and is responsible for management, coordination and execution of all investment program activities. Implementing Agency is the Madhya Pradesh Urban Development Company Limited (MPUDC) of GoMP, which is implementing this program via a Project Management Unit (PMU) at Bhopal, and regional Project Implementation Units (PIUs). The PMU will appoint contractors to build infrastructure and PIUs will coordinate the construction. PMU and PIUs will be assisted by Project Management Consultants (PMC).
39. The contractor will be required to submit to PMU, for review and approval, a Contractor a Comprehensive Environmental and Social Management plan (CESMP) including (i) proposed sites/locations for construction work camps, storage areas, hauling roads, lay down areas, disposal areas for solid and hazardous wastes and digested sludge; (ii) specific mitigation measures following the approved ESMP; (iii) monitoring program as per CESMP such as labour management plan, social impact management; and (iv) budget for CESMP implementation. And no works are allowed to commence prior to approval of CESMP. During implementation, the Contractor would be required to submit periodic reports covering ESHS parameters as required in the CESMP.

40. A copy of the ESMP/approved CESMP will be kept on site during the construction period at all times. The ESMP will be included in the bid and contract documents. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

Grievance Redressal Mechanism

41. A grievance redressal mechanism is proposed at the town level, which includes formulation of a Grievance Redressal Committee consisting of an Elected Representative (preferably female), a person who is publicly known and accepted by the locals to speak on their behalf (to be identified by the Elected Representatives of the SNP), Community Development officer from PIU and SNP level community organizer.
42. Affected person(s) shall file their grievance with the respective ULB, PIU or Contractor in writing or through telephone, clarifying the area of grievance i.e., grievances related to construction activities affecting the livelihood or loss of property/utility or restriction of access and the grievances regarding the quality of service during operation and maintenance period. The grievance shall be addressed within 48 hours. However, if there is any technical issue, the aggrieved will be informed accordingly.
43. The Project Manager from PIU for the project shall be the nodal officer for the grievance redressal. A log shall be maintained for all complaints/feedback received (in any form or channel) with respect to the project. The meeting of the committee shall be convened as and when necessary and at such place or places as it considers appropriate; and conduct the proceedings in an informal manner as he / she considers appropriate with the object to bring an amicable settlement between the aggrieved parties. The proceedings of all such meetings shall be prepared for record purposes.

Conclusion and Recommendations

44. Environmental and Social Assessment, was conducted, as per the environmental and social management framework of MPUDP to address the possible issues/ concerns arising from proposed project. The project report of the proposed sub-project Shajapur Town after environment and social assessment concludes that the project offers overall positive benefits on the life, health and environment of the people. There is no land acquisition or livelihood losses reported to be caused under this project.
45. There are no environmentally sensitive areas (like forest, sanctuaries, etc.) in or near sub-project area. Also, there are no archaeological and historical protected areas/ sites within or near the town. Hence the impacts identified are mostly related to construction and operation phase.
46. There is land purchase required for two IPS which will be done through mutual consent. IPS No. 4 is proposed at Khasra No. 220/1 which is owned by Mr Himmat Baig. The total area of this Khasra is 840 sqm out of which 50 sqm of land will be required for IPS. IPS No. 5 is proposed on Khasra No. 15 owned by Mr. Kishan Lal Prajapati. The total area of this Khasra is 8600 sqm out of which 50 sqm of land will be purchase for IPS. The process for land purchase has been initiated and will be completed before award of works.

47. Besides this, only minor damage to road side approaches to properties and loss of income for certain days and locations during construction have been estimated, however, these impacts will be verified again before start of construction works on site by DBOC jointly with SNP and PIU and this ESA and ESMP will be updated. In Project area, no indigenous people are identified meeting the requirement of indigenous peoples policy and hence, separate Indigenous Peoples Development Plan (IPDP) is not required.