

Environmental Planning Document

Draft Summary Initial Environmental Examination
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Bangladesh: Secondary Towns Water Supply and Sanitation Project

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DRAFT EXECUTIVE SUMMARY: INITIAL ENVIRONMENTAL EXAMINATION

A. Introduction and Description of the Sector Project

1. The Project will improve water supply and sanitation services by implementing water supply infrastructure improvements and strengthening local water utilities for operational efficiency and financial sustainability. The water supply component will develop and expand piped water supply systems, and provide shared standpipes and shared safe water points. The sanitation and behavioral change component is designed to extend the health impacts of project investments in water supply—promoting hygiene behavior and creating an enabling environment for preventing water-borne diseases through capacity building. It will include community and public sanitation facilities, school sanitation and hygiene education, and awareness and capacity building in hygiene education and sanitation. Capacity building and implementation assistance will also be provided for the executing agency (EA), and secondary towns. An overall initial environmental examination (IEE) and IEEs for sub-projects in four secondary towns (Brahmanbaria, Jessore, Sirajganj, and Pirojpur Pourashavas) were prepared. IEEs were based on field surveys, secondary information, and discussions with stakeholders. The salient points from the IEEs are summarized below.

B. Forecasting Environmental Impacts and Mitigation Measures

2. **Sector Impacts.** The Project is designed to maximize environmental and public health benefits. Improved water supply will provide better access to potable and adequate water supply resulting in reduced risk of water-borne diseases. The Project will provide water treatment facilities and will utilize deep aquifers which are not contaminated with arsenic. It will reduce risks from arsenic-related diseases particularly for households that currently use shallow tube wells that are likely to be contaminated with arsenic.¹ Reduced risk of water-borne and arsenic-related diseases will result in benefits from avoided costs of medication and avoided productivity losses. Improved sanitation and hygiene will further reduce the incidence of water-borne diseases, improve public health conditions, reduce ground water contamination, and avoid sewage flow in drainage canals, water ponds, and rivers. Potential negative impacts notably during construction and operation will not be significant considering the scale of the Project, avoidance of impacts through the application of environmental criteria in sub-project selection, and the incorporation of mitigation measures in design.

3. **Sub-project Impacts.** Sub-project selection will ensure that the Project will not have significant negative environmental impacts and will not have impacts on environmentally sensitive areas. Impacts that are potentially severe and permanent in nature have been identified, and an environmental sub-project selection criteria will reject sub-projects with such impacts.² Potential negative environmental impacts are mostly localized and temporary. These impacts can largely be avoided through proper sub-project design (particularly in siting), or mitigated through proper mitigation measures and environmental management. Potential negative impacts and mitigation measures are summarized in Table 1.

¹ The adverse health impacts evidenced by nervous system and other severe health deterioration systems are well recognized and publicized in Bangladesh. Technical options that will be adopted in the Project will consider various findings and guidelines in the National Policy for Arsenic Mitigation.

² Sub-projects classified as Category A will be rejected. Projects are categorized as “A” if they could have significant adverse environmental impacts (ADB OM Section F1/OP), for example affecting environmentally sensitive sites such as protected areas. Sub-projects classified as Category B or C will be accepted. Projects are categorized as “B” if they have some adverse environmental impacts, but of lesser degree and/or significance than those for category A projects. Projects are categorized as “C” if they are unlikely to have adverse environmental impacts.

C. Institutional Requirements and Environmental Monitoring Plan

4. The Department of Public Health Engineering (DPHE) is the EA responsible for the overall technical supervision and implementation of the Project through a Project Management Unit (PMU). The PMU will manage consulting services and will oversee the conduct of feasibility studies (including IEEs³) by project consultants. The PMU will be responsible for fulfilling environmental requirements of the Government and ADB, including incorporating mitigation measures in sub-project design and contract documents. Environmental controls pertaining to design and location will be incorporated into detailed design by project consultants. Mitigation measures during construction stage will be included as part of contract documents and will be implemented by the contractor.

Table 1: Potential Negative Environmental Impacts and Mitigation Measures

Category/ Impact Description	Magnitude /Duration of Impact	Mitigation Measures
Water Supply		
Location Impacts: Loss of land and livelihood.	I/P	Addressed in RP
Design Impacts: Groundwater contamination from well contamination due to surface run-off, garbage dumps, latrines, etc.	I/P	Well heads will be placed above flood level with proper sanitary seals. Well and auxiliary facilities will be in permanent structures. Integrity of the aquifer through proper well construction and design, and sealing of the aquifer or screened portion from the upper arsenic-contaminated horizon will be applied. For safe water points, measures will include siting of the well upgradient of potential sources of pollution; and provision of a concrete pad around the well to seal it from impurities.
Pollution due to improper sludge disposal methods.	I/P	Provision for collection of water used for filter backwashing for WTP, reinforced sludge tank and draining supernatant water. The remaining sludge will be taken to drying beds prior to disposal to a landfill or through land application. A sludge management plan will also be prepared for implementation during project operation. ⁴
Seismic hazards	I/P	The water supply facilities, particularly the WTP and OHT will be designed consistent with internationally accepted standards related to the seismicity risk of the pourashava so to minimize or prevent damage to the structures during earthquakes.
Disruption of water supply due to rehabilitation of existing connections.	M/T	A detailed phasing-in of the new water supply system will be formulated during the detailed engineering design taking in to consideration minimal disruption of water supply.
Construction Impacts:	I/T	As the known health risk related to asbestos is through inhalation, there are

³ ADB will review and approve IEEs for sample sub-projects revised after detailed design. These IEEs will serve as models to guide IEEs for future sub-projects. In addition to the IEEs for sample sub-projects, ADB will review and approve IEEs for future sub-projects valued above a free limit.

⁴ A BUET-UNU (2001) study regarding levels of arsenic in sludge from treatment plants in various areas in Bangladesh shows that the current sludge disposal appear to be safe since Toxic Characteristic Leaching Procedure (TCLP) levels of arsenic are considered non-hazardous such that this does not contribute to recontamination of the environment. The highest leachate concentration observed was 0.043 mg/L which is over 100 times less than the USEPA hazardous waste criteria and is also well below the drinking water criteria of 0.05 mg/L. This suggests that the arsenic being removed from the drinking water remains in a stable and non-mobile form in the sludge and may be disposed of in a landfill or through land application as fertilizer, particularly if the media has high iron content. As the arsenic levels in surface water and deep aquifer are well below the standards, impacts due to sludge disposal are not considered significant.

⁵ While USEPA has set an asbestos limit of 7 million fibers per liter of drinking water, the evidence on cancer from asbestos ingestion remains inconclusive. Classification of asbestos as a human carcinogen is based on inhalation studies (USEPA Office of Air Quality Planning and Standards Asbestos: Health and Exposure, <http://www.epa.gov/asbestos/help.html#Info>). Results of epidemiological studies of populations with drinking-water supplies containing high concentrations of asbestos fiber show that ingestion of asbestos has not been proven to be hazardous to health and to cause cancer. As such, WHO has not established a health-based guideline value for

Category/ Impact Description	Magnitude /Duration of Impact	Mitigation Measures
Health hazards due to replacement of AC pipes.		<p>impacts associated with the rehabilitation activities.⁵ Mitigation measures include: (i) damaged AC pipes will be left in place and the replacement PVC pipes, whenever possible will be laid parallel to the existing AC pipes; (ii) adequate space will be provided between the proposed and current alignments, so that the excavation of trenches for the replacement PVC pipes will not expose the AC pipes. Left buried, impacts due to exposure to airborne asbestos fibers are eliminated; and (iii) maintenance workers will be made aware that the old pipe is still there through appropriate documentation and a marker layer.</p> <p>An asbestos management plan will be prepared by a qualified international asbestos management consultant as part of the Project Consultants.⁶ Exposure to asbestos can be prevented by containment, regular inspections, and proper precautions when working around or with the material.</p>
Pollution of water resources	M/T	Adequate run-off and drainage control in construction areas. Discharge of sediment laden construction water into settling ponds prior to final discharge. No direct discharge into surface watercourses. Proper stockpiling and disposal of earth, stones and solid wastes so these do not block rivers and streams, thereby avoiding adverse impact on water quality and flow regime.
Nuisance/inconvenience during installation and/or rehabilitation works of transmission and distribution mains.	M/T	Watering of exposed areas during dry day, installation or replacement of pipes within the shortest time possible and/or use of night time schedules, announcement of water supply interruptions, proper stockpiling and immediate disposal of spoils, immediate restoration of roads, and proper coordination with local authorities regarding traffic flow supervision and diversion, road closures and corresponding schedules as well as posting of traffic advisory signs. A construction site management plan will be prepared by the contractor prior to any site works.
Dust and noise from construction of WTP and OHT.	M/T	Provision of cover on haul trucks, water spraying, proper maintenance of equipment and use of mufflers, and scheduling of noise generating activities during daytime.
Damage to existing facilities.	I/T	Coordination with the concerned pourashava agencies and procurement of required clearances prior to site works. A safety plan will be prepared and workers will be properly oriented prior to site works particularly near gas lines.
Safety hazards during construction	I/T	Workers oriented on safe practices and provided with appropriate personnel protective gear. Provision of adequate protection to the general public, such as safety barriers where excavation is being undertaken.
O & M Impacts: Hazard of land subsidence	I/P	Safe yield of the well field will be assessed. The safe drawdown of the well field can be established by pump tests on some of the existing bores.
Pollution due to improper sludge disposal methods	M/P	Impacts due to improper disposal of sludge will be avoided through the implementation of a sludge management plan.
Delivery of unsafe water to distribution system	I/P	Capacity building program on operation and maintenance for the water supply staff of the Pourashavas. Groundwater from production wells will be tested using field kits on a quarterly basis for arsenic and iron concentrations and the sand content. Monitoring of the quality (pH, fecal coliform, turbidity and NH ₃) of treated surfacewater will be conducted on a quarterly basis.
Sanitation		
Design Impacts: Sewage contamination	I/P	Minimum distance between a hand pump/dug well and a pit latrine, soak pit or a sludge pit will be 15 meters.

asbestos fiber in drinking water (WHO. 2003. Arsenic in Drinking-water. Background document for preparation of WHO Guidelines for drinking-water quality. Geneva, World Health Organization).

⁶ The plan will be undertaken by qualified contractors and detail: (i) internationally accepted protocols on handling asbestos containing materials during the replacement process so as to ensure that fibers are not released to the environment; (ii) precautionary measures and equipment requirement to prevent exposure of workers and the general public; (iii) identification and proper marking of areas where AC pipes are buried so that accidental exposure of such materials is avoided (iv) monitoring and inspection protocols, and (v) other appropriate measures to minimize or eliminate impacts related to asbestos containing materials.

Category/ Impact Description	Magnitude /Duration of Impact	Mitigation Measures
of groundwater		
Construction Impacts: Nuisance/inconvenience during installation of latrines	I/P	Impacts will be minimized through proper stockpiling and immediate disposal of spoils or excavated soils. Haul trucks will be covered during transport.
Pollution of water bodies	I/P	Earth, stones and solid wastes will not be dumped in water courses and water ponds to avoid adverse impact on water quality and flow regime. Disposal will be coordinated with the local authorities.
Operation: Decreased efficiency of pits and septic tanks	I/P	To ensure efficiency of latrines with on-site treatment, desludging will be undertaken at a frequency of once or twice a year for pits and every 2 to 3 years for septic tanks. The Project shall support the Pourashavas to procure small (500 liter) capacity desludging tanks, which are wheel mounted and can enter narrow streets or paths.
Pollution due to disposal of sludge from septic tanks and pit latrines	I/P	The recommended method for sludge disposal for the Project shall be composting of collected sludge in compost or sludge pits. The sludge pit will be protected from runoff water by providing adequate drainage and by putting up sheds to cover the pits to protect these from rain. Sludge pits should be located in an area that has road access, downwind of and about 2 km from the main town area, and away from surface water bodies and tube wells. As much as possible, the pits should be constructed in an elevated and dry area.

AC-asbestos cement, I-insignificant, WTP-water treatment plant, M-moderate, NH₃-, OHT-overhead tank, P-permanent, pH-, PVC-, S-significant, T-temporary

5. Project Implementation Units (PIUs) will be established in each subproject pourashava and its responsibilities include: construction supervision, local level procurement, contracting local nongovernmental and community-based organizations (NGOs and CBOs) for implementing health and hygiene education programs, assessing work carried out by contractors, and preparing quarterly reports on the implementation of environmental mitigation measures and monitoring plan at the construction stage.

6. An environmental monitoring program for the construction and operation stage of sub-projects will be undertaken to monitor environmental impacts, determine conditions requiring remedial measures, and assess compliance with Government and ADB environmental safeguard policies. Contractors will implement mitigation measures and prepare monthly progress reports to be submitted to the PIUs during construction.⁷ The project consultant will monitor the compliance of the contractor in implementing required mitigation measures and environment-related contract provisions. The project consultant, in cooperation with the PIU, will be required to: (i) develop an environmental auditing protocol for the construction period; and (ii) monitor the contractor's performance regarding implementation of mitigation measures and submit quarterly reports based on the monitoring data/findings. Reports prepared by contractors and quarterly monitoring reports prepared by project consultants will be consolidated and submitted to the PMU for review.

7. During operation, the responsibility for monitoring environmental performance will be the Pourashava's (through their respective Water Supply Section and Health and Sanitation Section who will be provided with training on environmental management under the Project). Pourashavas will undertake regular monitoring of water quality parameters and sludge disposal throughout the life of the Project. Monitoring of various parameters will be undertaken by the

⁷ Tender and contract documents will clearly set out contractor's obligations to undertake environmental mitigation measures. The head contractor will recruit an environmental, health and safety officer (EHS), who will be responsible for implementing the contractors' environmental responsibilities, and for liaising with the PIU and PMU. The EHS officer will also be responsible for health and safety aspects of work sites.

Pourashava consistent with the schedule indicated in the IEE and will prepare annual reports. Should there be any complaints arising from the operation of water treatment plants and associated facilities, and sanitation facilities, the Pourashava will conduct site inspections and appropriate sampling to validate claims. Based on the findings, mitigation measures will be implemented by the Pourashava. Consistent with their mandate, the Department of Environment will undertake routine and random monitoring of specific environmental plans in IEEs.

D. Public Consultation and Disclosure

8. During project preparation, consultations were undertaken involving government officials, affected people, community leaders, civil society, and NGOs. These consultations included various meetings, 29 focus group discussions, key informant surveys in four pourashavas, and a socio-economic survey with 4,847 respondents. During the preparation of the IEE, stakeholder consultations were conducted in four pourashavas. These were attended by a total of 162 participants representing local residents, ward commissioners, local NGOs, as well as Pourashava and DPHE staff and officials. During the consultations, the purpose and components of the Project were presented along with the benefits and potential impacts during project implementation. In addition, slum areas were visited and some of the residents were informed about the proposed interventions and their perceptions about the Project were gathered. The results of the consultations are positive. The participants were assured that negative impacts will be mitigated through implementation of an EMP which specifies mitigation measures and monitoring during construction and operation phases, and that mandatory compliance of the contractors to environmental controls will be required. Further, the participants were also informed that there will be capacity building at the Pourashava and DPHE levels to ensure the success of the Project.

9. An extensive information campaign will be conducted by contracted NGOs to educate households on water-borne diseases, health-risks associated with the consumption of arsenic-contaminated water, and unhygienic practices as well as on the proper use and maintenance of water supply and sanitation facilities. During detailed design, further information will be disclosed and public awareness programs will be conducted. The IEEs will be translated in local language and disclosed through public notices at the Pourashava offices, and through mass media. Consultations will be done during implementation through the participation of NGOs who will be contracted under the Project to conduct information and education campaigns, awareness programs, and organization of the water user groups.

E. Findings, Recommendations, and Conclusions

10. Findings of the IEE show that sample sub-projects will result in substantial net environmental benefits and will not generate major negative environmental impacts. The application of sub-project selection criteria, and the implementation of the environmental monitoring plan—which details mitigation measures, implementation responsibilities, and monitoring plan as defined in the IEE—will address any adverse impacts. No further assessment of environmental impacts is required for sub-projects in sample pourashavas.

F. Environmental Selection Criteria and Environmental Review Procedures

11. To ensure compliance with Government and ADB environmental guidelines and requirements, environmental sub-project selection criteria and environmental assessment and review procedures (EARP) to guide the implementation of future sub-projects have been developed.

12. The environmental sub-project selection criteria ensures that sub-projects will not result in significant environmental impacts. A rapid environmental assessment (REA) will be used to ensure appropriate environmental assessment. The EARP is based on provisions of the Government's Environmental Conservation Rules of 1997 and the Environmental Assessment Guidelines of ADB. The EARP also details the (i) Government's environmental assessment and review procedures for sanitation and water supply, (ii) responsibilities and authorities involved in environmental assessment and review, (iii) compliance of the Project with ADB's environmental guidelines, and (iv) staffing requirements and budgets; The Project will only consider sub-projects classified as environmental category B. Consistent with ADB policies, environmental category B sub-projects require an IEE with the following components: (i) introduction, (ii) description of the sub-project, (iii) description of the environment, (iv) screening of potential environmental impacts and mitigation measures, (v) institutional requirements and environmental monitoring plan, (vi) public consultation and information disclosure, (vii) findings and recommendation; and (viii) conclusions. The IEEs for sample-subprojects will be used as models for the preparation and implementation of other sub-project IEEs.