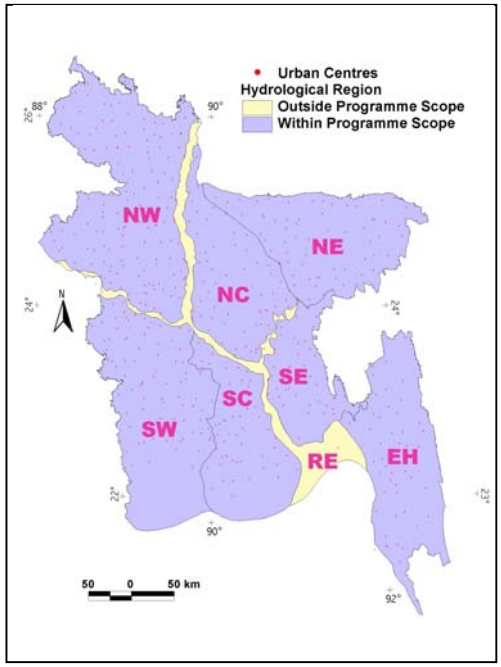
## Large and Small Towns Water Supply and Distribution Systems Ref: **TR 003**

### Basic Data

NWMP Sub-sector **Towns and Rural Areas**

Region(s) **Nationwide significance**




### Relevance to NWPo

Water allocation for domestic and municipal use is the first priority under the NWPo. The programme for Large and Small Towns, under both the NWPo and the National Policy for Safe Water Supply and Sanitation (NPSWSS), aims to address the need for "….safe and affordable drinking water supplies through various means.…" for all inhabitants, especially the urban poor. Policy also mandates that investments to improve and extend water services in the urban areas should be paralleled by appropriate and substantive institutional and financial reforms to attain:

(a) decentralisation and devolution of management authority to local government;
(b) significant improvements in service efficiency and financial viability of existing institutions;
(c) private sector participation;
(d) stakeholder consultation, especially women and the poor; and
(e) appropriate pricing structures to promote financial viability and effective cost recovery.

### Purpose of Programme

There are 522 towns (1991 Census) throughout the country: 44 large towns (more than 50,000 people) with a total population of 9.8 million in 2000; and 478 small towns (less than 50,000 people) with a combined population of 4.2 million. The total population of all towns (large and small) is expected to increase five-fold in the next 50 years, from nearly 14 million in 2000 to 36 million in 2025 and 67 million by 2050. All towns will experience increasing pressure to improve and extend their public services and infrastructure, especially the need for a safe and reliable water supply system for all inhabitants. Service coverage for potable water varies between towns and regions. NWMP estimates for the whole sector indicate the following present service coverage:

(a) large towns - 75% of the total population is adequately served, with 40% served by HTWs, 25% by DTW based systems and 10% by a combination of small and community based systems; and
(b) (b) small towns - 82% of the total population is adequately served, with 80% served by shallow HTWs and the other 2% by other reliable sources.

The remaining population (25% in large towns and 18% in small towns), mainly poor and disadvantaged communities, are dependent on other local sources, many of which are unreliable, inadequate and often polluted. Current estimates indicate that 35% of town populations are classified as living in poverty.

The programme for large and small towns will require significant investment in rehabilitation, improvement and extension of urban water supply systems to raise and sustain service coverage levels at 100% by 2010. This will be accomplished through a combination of public/private sector initiatives to develop urban and community-based systems, largely based on groundwater sources with some surface water development in the large towns. Special attention will be given to peri-urban and poor communities who will be encouraged and supported to develop and install safe hand pumps and small DTW based systems.

The programme provides a general framework for the Large and Small Towns Sector, but final investment decisions will depend on the individual requirements and aspirations of each town.

**Programme Outline**

Improvements and extensions of urban water supply systems will continue throughout the implementation of the NWMP. The coverage targets by service type are summarised as follows:

| Component | Year | | | |
|---|---|---|---|---|
| | 2000 | 2005 | 2010 | 2025 |
| **Large Towns (population greater than or equal to 50,000)** | | | | |
| Population (million) | 9.8 | 12.2 | 14.9 | 25 |
| Water supply coverage (%) | | | | |
| HTW | 40 | 25 | 5 | 0 |
| Arsenic filter on HTW/Tara pump (1) | 0 | 10 | 5 | 0 |
| Small DTW based systems | 1 | 6 | 30 | 35 |
| Community level water supply system | 5 | 15 | 15 | 10 |
| Urban DTW based piped systems | 25 | 30 | 30 | 45 |
| Surface water sources with piped distribution | 3 | 5 | 10 | 10 |
| Other options | 1 | 2 | 2 | 0 |
| Total | 75 | 93 | 97 | 100 |
| **Small Towns (population less than 50,000)** | | | | |
| Population (million) | 4.2 | 5.2 | 6.4 | 10.7 |
| Water supply coverage (%) | | | | |
| Shallow HTW | 80 | 35 | 25 | 5 |
| Arsenic filter on Deep HTW/Tara pump (1 | 0 | 30 | 5 | 0 |
| Arsenic removal in households (1) | 1 | 10 | 0 | 0 |
| Small DTW based piped systems | 0 | 5 | 30 | 60 |
| Urban DTW based piped systems | 1 | 15 | 30 | 25 |
| Surface water sources with piped distribution | 0 | 0 | 0 | 5 |
| Other options | 1 | 5 | 10 | 5 |
| Total | 83 | 100 | 100 | 100 |

Note: (1) Arsenic mitigation is addressed under Programme TR 001.

**Financing Arrangements**

For effective sustained implementation, the investment programme will require the active and co-ordinated participation of the public sector (GoB and international development agencies), private sector (domestic and foreign, the latter in the medium to long term), and community based organisations with the support of NGOs. Indicative financing targets are presented below:

| Sector | % |
|---|---|
| Public (GoB and international development agencies) | 75 |
| Private (domestic and foreign) | 20 |
| Local Communities | 5 |
| Total | 100 |

The Government and the executing agencies (public and private) will need to ensure the availability of adequate funds for:
(a) rehabilitation of existing water supply facilities;
(b) capital replacement during and after the NWMP period; and
(c) effective operations and maintenance.

In this context, the development of full cost recovery pricing will be important.

**Objectives and Indicators**

| Objective | Suffix | Indicators/Means of Verification | Due |
|---|---|---|---|
| • Town water supply programmes prepared | I1 | • Signed programme/project documents | 2006 |
| • Sustainable operation and maintenance of town water supply systems | I2 | • Frequency of pipe breaks<br>• Response times | 2011 |
| • Town water supply programme completed | I3 | • Programme/project completion reports<br>• Household, district surveys | 2026 |
| • 100% of large and small town population have access to formal water supplies | K | • Survey reports | 2026 |
| • Demand for safe and reliable drinking water supplies satisfied in towns and rural areas | D | • % service coverage verified by surveys | 2026 |

**Institutional Arrangements**

The institutional arrangements for programme implementation are expected to comprise three components as defined by the NWPo and NPSWSS:

(a) Public sector - under the policy of decentralisation, the local municipal authorities (e.g. Paurashavas and Upazilas) will have prime responsibility, with the technical support of DPHE and LGED. Much greater emphasis will be given to increased autonomy and management expertise, organisational reform, service coverage and efficiency, full cost recovery and financial viability.
(b) Private sector participation - in the medium to longer term, the private sector is expected to play an increasing role in the provision of water services in the Large and Small Towns. This will include: contract services (e.g. operation and maintenance of specific facilities, revenue billing and collection, etc.); BOT/BOOT schemes where appropriate; and full private concessions for the main water supply system in a town or group of towns. In partnership with community based organisations, the private sector will also be expected to play a leading role in the development and operation of peri-urban water supply schemes.
(c) Community-based and NGO participation - in the peri-urban and disadvantaged areas, community-based water supply schemes will be encouraged with investment funds from GoB, and the collaboration of NGOs and the private sector. Prominence should also be give to the active participation of women.

The implementation of these institutional developments will need to be carefully formulated and programmed with the full political commitment of GoB and interested stakeholders. In the short to medium term, the Government will also establish an appropriate independent Regulatory Framework to supervise and monitor public and private sector performance in the provision of water services.

**References and Documentation**

(a) Chapter 7, Development Strategy Report, March 2001
(b) National Water Resources Database in WARPO

**Linkages**

Note: The issue of arsenic contamination in town water supplies is addressed separately under Programme TR 001 - Arsenic Contamination in Town Water Supplies

The sustained development of water supply services for Large and Small Towns should be closely linked and co-ordinated with other NWMP programmes, namely:
(a) Local Government Needs Assessment for Water Management (ID 001);
(b) Local Government Capacity Building for Water Management (ID 005);
(c) Independent Regulatory Bodies for the Water Supply and Sanitation Service Sector (ID 002);
(d) Support to the Preparation of New Legislation (EE 001);
(e) Field Testing of Participatory Management Models (EE 002);
(f) Water Resources Legislation – Preparation of Supporting Ordinances (EE 003);
(g) Project Preparation Procedures - Guidelines and Manuals (EE 004);
(h) Regulatory and Economic Instruments (EE 005);
(i) Field Testing & Finalisation of Guidelines for Participatory Water Management (EE 006);
(j) Raising Public Awareness in the Wise Use and Management of Water (EE 010);
(k) Private Sector Participation in Water Management (EE 011);
(l) Alternative Financing Methods for Water Management (EE 013);
(m) Urban Arsenic Mitigation (TR 001);
(n) Large and Small Towns Sanitation and Sewerage Systems (TR 005);
(o) Large and Small Towns Flood Protection (TR 007);
(p) Large and Small Towns Stormwater Drainage (TR 008);
(q) National Clean-up of Existing Industrial Pollution (EA 002);
(r) National Pollution Control Plan (EA 001);
(s) National Water Quality Monitoring (EA 003); and
(t) Public Awareness Raising and Empowerment in respect of Environmental Issues (EA 010).

The Inventory and Asset Management Plan of the Water Supply and Sanitation Sector (MC 001) is also relevant here.

In addition, planning and implementation should be co-ordinated with the respective Local Government authorities (District towns, Paurashavas (municipalities), Upazila headquarters and urban growth centres), Ministry of Local Government, Rural Development and Co-operatives (MoLGRDC), Department of Public Health Engineering (DPHE), Local Government Engineering Department (LGED), Urban Development Directorate (UDD), Ministry of Health (MoH), Ministry of Industry (MoI), Department of Environment (DoE), WARPO, NGOs and other interested parties.

**Risks and Assumptions**

There are a number of important risks associated with a sustained development programme for the provision of safe and reliable water services in Large and Small Towns. They fall into four main categories: technical, institutional; financial and environmental.

With the exception of the serious arsenic problem (see: TR 001 and TR 002), the technical risks associated with urban water supply systems are the current poor standards of operation and maintenance. These shortcomings can be mitigated if the institutional and financial issues are addressed in a constructive and comprehensive manner.

The institutional risks focus mainly on the political willingness and commitment to reform the organisation and management of urban water services through a concerted drive to improve efficiency, involve the private sector, and promote effective consumer participation. National policy statements (NWPo and NPSWSS) clearly indicate that Government is aware of the problems, but it will need real political commitment to create an independent structure which is solely dedicated to the provision of effective and efficient water services for all inhabitants.

The financial risks are that the necessary investment and maintenance resources for the Large and Small Towns will become increasingly constrained from international sources and the private sector, if the institutional and efficiency issues are not addressed in a constructive manner, and Government does not give sustained support for the policy of full cost recovery. Future Government investment budgets will be under increasing pressure from other public sectors; therefore, it is crucial that there is a phased introduction of private sector participation and effective promotion of community-based systems particularly for peri-urban and disadvantaged communities.

The environmental risks for water supply are mainly related to any waste product from the water treatment process and construction operations. These risks can be mitigated, together with a parallel programme to deal with municipal and industrial wastewater.

Assumptions:
Materials used for construction of new systems will give the assumed working lives.
Construction of new systems is adequately supervised so as to minimise future operation and maintenance.
Technical skills will be adequate to enable the efficient and effective O & M of the water systems.
The operating utility will be able to run the water supply function without political interference.
Full cost recovery is affordable.
Environmental risks can be successfully mitigated.

## Large and Small Town Water Supply and Distribution Systems

Ref : **TR 003**

| | | | |
|---|---|---|---|
| Cluster : | **Towns and Rural Areas** | Region(s) : | **All** |
| Focus/Foci : | **Water Supplies** | Location : | **Nationwide** |
| Start Year[1] : | **2002** Duration[2] : **25 year(s)** | Agency(s) Responsible : | **DPHE** **(Lead)**<br>CBOs, Private Sector (Supporting) |

Short Description : The preamble to NWPo §4.6 of the NWPo highlights the water supply problems facing Bangladesh's urban areas (large and small). Water tables are receding due to heavy groundwater abstraction. Furthermore, saline intrusion in coastal aquifers and contamination elsewhere further compromises the drinking water supplies for urban inhabitants. In accordance with the Government's policy to "Facilitate availability of safe and affordable drinking water supplies." (NWPo §4.6.a), this programme is intended to provide resources for the implementation of piped water supply schemes fed from DTW or surface water sources in order to serve 100% of the population (of each town) with piped drinking water supplies by year 2010.

## MIS Links

| | | | |
|---|---|---|---|
| Cost Calculation : | TR Programme costing.xls | Map : | TR 003 Map.jpg |
| Disb't Schedule : | TR Programme costing.xls | Description : | TR 003 PgP.doc |

## Finance

| | Costs | | Private | Funding (%) GoB | Beneficiaries | Expected by ProgrammeYear |
|---|---|---|---|---|---|---|
| Total Capital[3] | **44,055.00** | MTk | **0%** | **100%** | **0%** | **25** |
| Ultimate Recurring | **7,820.80** | MTk/yr | **n/a** | **0%** | **100%** | **26** |

Date of Data : **31** (dd) **07** (mm) **01** (yy)

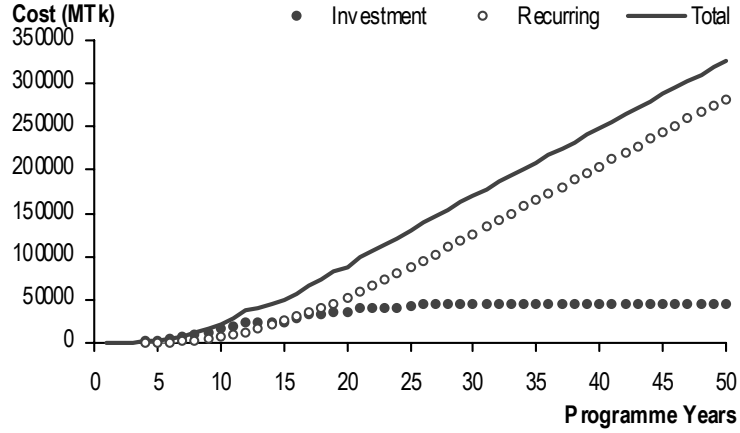
Status : **Identified**

Financial Base Year: **mid-2000**

Planned Expenditure (to date) : **0** MTk

Actual Expenditure[4] (to date) : **0** MTk

**Stacked Cumulative Cash Flow Chart**




## Monitoring

| Objective | Indicator | Present Status[5] |
|---|---|---|
| • Town water supply programmes prepared | • Signed programme/project documents | NYD |
| • Sustainable operation and maintenance of town water supply systems | • Frequency of pipe breaks<br>• Response times | NYD |
| • Town water supply programme completed | • Programme/project completion reports<br>• Household, district surveys | NYD |
| • 100% of large and small town population have access to formal water supplies | • Survey reports | NYD |

Notes : 1. Indicative 2. Until commissioning 3. Inclusive of planning, design _supervision 4. For future monitoring purposes and NWMP updates
5. Present Status keys: NYD- Not yet due, IP- In progress, D- Done

**National Water Management Plan**

**Programme Costing Sheet**

| | |
|---|---|
| Programme Ref | **TR 003** |
| Title | **Large and Small Town Water Supply and Distribution Systems** |

*Assumptions:*

| | | | | | |
|---|---|---|---|---|---|
| Taka/US$ | 51.000 | TA duration | 0.0 | years | All prices in mid-2000 values |
| | | Investment duration | 25.0 | years[1] | |

| Item | Unit | Quantity | Rate US$ | Rate Tk'000 | Amount TkM | O&M % | O&M/yr TkM |
|---|---|---|---|---|---|---|---|
| **Technical Assistance** | | | | | | | |
| Expatriate consultants (all-in rate) | | | | | | | |
| Senior National consultants (all-in rate) | | | | | | | |
| Mid-level National consultants (all-in rate) | | | | | | | |
| Sub-totals | | | | | | | |
| Other general TA programme costs | | | | | | | |
| Specific other TA programme costs | | | | | | | |
| **Total TA Costs** | | | | | | | |
| | | | Lump Sum Costs | | | | |
| **Investment items - short term** | | | Large towns | Small towns | | | |
| Mini tara + arsenic filter in existing HTW | | | costed in programme TR 001 | | | | |
| FM hand pump (local Tara) with new HTW | | | 22.00 | 28.00 | 50.0 | *13.5%* | 6.8 |
| Mini Tara in existing HTW | | | 53.00 | 79.00 | 132.0 | *13.4%* | 17.7 |
| Urban piped supply from SW | | | 840.00 | - | 840.0 | *13.5%* | 113.4 |
| Urban piped supply from DTW +IRP | | | 503.00 | 541.00 | 1,044.0 | *12.7%* | 132.6 |
| Urban piped supply from DTW | | | 1,055.00 | 566.00 | 1,621.0 | *14.8%* | 239.9 |
| Peri-urban mini DTW + IRP +Distribution | | | 353.00 | 132.00 | 485.0 | *21.2%* | 102.8 |
| Peri-urban mini DTW + Distribution | | | 345.00 | 152.00 | 497.0 | *23.6%* | 117.3 |
| Existing HTW +household arsenic removal | | | - | 62.00 | 62.0 | *89.1%* | 55.2 |
| Community level WS | | | 74.00 | - | 74.0 | *138.0%* | 102.1 |
| **Investment items - medium term** | | | | | | | |
| Mini Tara in existing HTW | | | 19.00 | 136.00 | 155.0 | *13.4%* | 20.8 |
| Urban piped supply from SW | | | 2,327.00 | - | 2,327.0 | *13.5%* | 314.1 |
| Urban piped supply from DTW +IRP | | | 555.00 | 778.00 | 1,333.0 | *12.7%* | 169.3 |
| Urban piped supply from DTW | | | 581.00 | 814.00 | 1,395.0 | *14.8%* | 206.5 |
| Peri-urban mini DTW + IRP +Distribution | | | 1,477.00 | 702.00 | 2,179.0 | *21.2%* | 461.9 |
| Peri-urban mini DTW + Distribution | | | 2,529.00 | 1,084.00 | 3,613.0 | *23.6%* | 852.7 |
| Community level WS | | | 22.00 | - | 22.0 | *138.0%* | 30.4 |
| **Investment items - long term** | | | | | | | |
| Urban piped supply from SW | | | 2,663.00 | 1,416.00 | 4,079.0 | *13.5%* | 550.7 |
| Urban piped supply from DTW +IRP | | | 4,654.00 | 891.00 | 5,545.0 | *12.7%* | 704.2 |
| Urban piped supply from DTW | | | 4,873.00 | 355.00 | 5,228.0 | *14.6%* | 763.3 |
| Peri-urban mini DTW + IRP +Distribution | | | 1,323.00 | 1,975.00 | 3,298.0 | *21.2%* | 699.2 |
| Peri-urban mini DTW + Distribution | | | 3,155.00 | 2,907.00 | 6,062.0 | *23.6%* | 1,430.6 |
| Community level WS | | | 14.00 | | 14.0 | *138.0%* | 19.3 |
| **Total Investment Items** | | | | | **40,055.0** | ***17.8%*** | **7,110.7** |

TA costs for this programme are included in the capital costs

| | | |
|---|---|---|
| **Overall Costs of meeting demands accruing during NWMP timeframe** | **40,055.0** | **7,110.7** |
| **Additional NWMP provision to maintain capacity ahead of demand** | **4,000.0** | **710.1** |
| | **44,055.0** | **7,820.8** |

Notes 1 The step-wise approach to investment necessary to achieve and maintain installed capacity ahead of demands may mean that the total investment against +25 year demand is disbursed within the 25 year horizon. However, an additional provision will also be disbursed before the end of the 25 year, in order again to keep capacity ahead of ongoing demand increases.

**Large Town Water Supplies (>50,000 in 2025 but not SMAs)** **Coverage Targets (%)**

| Option | Description | Total Annual Cost (Tk/m$^3$) | 2000 | 2005 | 2010 | 2025 | 2050 |
|---|---|---|---|---|---|---|---|
| | Total population | | 9,780,000 | 12,220,000 | 14,910,000 | 24,980,000 | 46,900,000 |
| | Existing HTWs | | 40% | 25% | 5% | 0% | 0% |
| N3.2.1 | Mini Tara + arsenic filter in existing HTW | 17.00 | 0% | 10% | 5% | 0% | 0% |
| N3.2.2 | FM hand pump (local Tara) with new HTW | 1.33 | 0% | 0% | 0% | 0% | 0% |
| N3.2.3 | Mini Tara in existing HTW | 2.65 | 1% | 2% | 2% | 0% | 0% |
| N3.9 | Urban piped supply from SW | 7.82 | 3% | 5% | 10% | 10% | 10% |
| N3.10.1 | Urban piped supply from DTW + IRP | 5.73 | 10% | 10% | 10% | 15% | 20% |
| N3.10.2 | Urban piped supply from DTW | 3.51 | 15% | 20% | 20% | 30% | 30% |
| N3.11.1 | Peri urban mini DTW + IRP +distribution | 6.11 | 1% | 3% | 10% | 10% | 5% |
| N3.11.2 | Peri urban mini DTW + distribution | 5.01 | 0% | 3% | 20% | 25% | 25% |
| N3.12 | Community level WS (slum) | 8.32 | 5% | 15% | 15% | 10% | 10% |
| | | | **75%** | **93%** | **97%** | **100%** | **100%** |

**Large Town Water Supplies (>50,000 in 2025 but not SMAs)** **Coverage Targets - Number of Population**

| Option | Description | 2000 | 2005 | 2010 | 2025 | 2050 |
|---|---|---|---|---|---|---|
| | Total population | 9,780,000 | 12,220,000 | 14,910,000 | 24,980,000 | 46,900,000 |
| | Existing HTWs | 3,912,000 | 3,055,000 | 745,500 | 0 | 0 |
| N3.2.1 | Mini Tara + arsenic filter in existing HTW | 0 | 1,222,000 | 745,500 | 0 | 0 |
| N3.2.2 | FM hand pump (local Tara) with new HTW | 0 | 0 | 0 | 0 | 0 |
| N3.2.3 | Mini Tara in existing HTW | 97,800 | 244,400 | 298,200 | 0 | 0 |
| N3.9 | Urban piped supply from SW | 293,400 | 611,000 | 1,491,000 | 2,498,000 | 4,690,000 |
| N3.10.1 | Urban piped supply from DTW + IRP | 978,000 | 1,222,000 | 1,491,000 | 3,747,000 | 9,380,000 |
| N3.10.2 | Urban piped supply from DTW | 1,467,000 | 2,444,000 | 2,982,000 | 7,494,000 | 14,070,000 |
| N3.11.1 | Peri urban mini DTW + IRP +distribution | 97,800 | 366,600 | 1,491,000 | 2,498,000 | 2,345,000 |
| N3.11.2 | Peri urban mini DTW + distribution | 9,780 | 366,600 | 2,982,000 | 6,245,000 | 11,725,000 |
| N3.12 | Community level WS (slum) | 489,000 | 1,833,000 | 2,236,500 | 2,498,000 | 4,690,000 |
| | | 7,344,780 | 11,364,600 | 14,462,700 | 24,980,000 | 46,900,000 |

**Large Town Water Supplies (>50,000 in 2025 but not SMAs)** **Incremental Coverage Targets - Number of Population**

| Option | Description | 2000 | 2005 | 2010 | 2025 | 2050 |
|---|---|---|---|---|---|---|
| | Total population | 9,780,000 | 104,800,000 | 107,100,000 | 107,700,000 | 88,000,000 |
| | Existing HTWs | | -857,000 | -2,309,500 | -745,500 | 0 |
| N3.2.1 | Mini Tara + arsenic filter in existing HTW | | 1,222,000 | -476,500 | -745,500 | 0 |
| N3.2.2 | FM hand pump (local Tara) with new HTW | | 0 | 0 | 0 | 0 |
| N3.2.3 | Mini Tara in existing HTW | | 146,600 | 53,800 | -298,200 | 0 |
| N3.9 | Urban piped supply from SW | | 317,600 | 880,000 | 1,007,000 | 2,192,000 |
| N3.10.1 | Urban piped supply from DTW + IRP | | 244,000 | 269,000 | 2,256,000 | 5,633,000 |
| N3.10.2 | Urban piped supply from DTW | | 977,000 | 538,000 | 4,512,000 | 6,576,000 |
| N3.11.1 | Peri urban mini DTW + IRP +distribution | | 268,800 | 1,124,400 | 1,007,000 | -153,000 |
| N3.11.2 | Peri urban mini DTW + distribution | | 356,820 | 2,615,400 | 3,263,000 | 5,480,000 |
| N3.12 | Community level WS (slum) | | 1,344,000 | 403,500 | 261,500 | 2,192,000 |
| | | | 4,019,820 | 3,098,100 | 10,517,300 | 21,920,000 |

**Large Town Water Supplies (>50,000 in 2025 but not SMAs)** **Incremental Investment Requirements - Number of Population**

| Option | Description | 2000 | 2005 | 2010 | 2025 | 2050 |
|---|---|---|---|---|---|---|
| | Total population | 9,780,000 | 12,220,000 | 14,910,000 | 24,980,000 | 46,900,000 |
| | Existing HTWs | | 0 | 0 | 0 | 0 |
| N3.2.1 | Mini Tara + arsenic filter in existing HTW | | 1,222,000 | 0 | 0 | 0 |
| N3.2.2 | FM hand pump (local Tara) with new HTW | | 0 | 0 | 0 | 0 |
| N3.2.3 | Mini Tara in existing HTW | | 146,600 | 53,800 | 0 | 0 |
| N3.9 | Urban piped supply from SW | | 317,600 | 880,000 | 1,007,000 | 2,192,000 |
| N3.10.1 | Urban piped supply from DTW + IRP | | 244,000 | 269,000 | 2,256,000 | 5,633,000 |
| N3.10.2 | Urban piped supply from DTW | | 977,000 | 538,000 | 4,512,000 | 6,576,000 |
| N3.11.1 | Peri urban mini DTW + IRP +distribution | | 268,800 | 1,124,400 | 1,007,000 | 0 |
| N3.11.2 | Peri urban mini DTW + distribution | | 356,820 | 2,615,400 | 3,263,000 | 5,480,000 |
| N3.12 | Community level WS (slum) | | 1,344,000 | 403,500 | 261,500 | 2,192,000 |
| | | | 4,876,820 | 5,884,100 | 12,306,500 | 22,073,000 |

**Large Town Water Supplies (>50,000 in 2025 but not SMAs)** **Incremental Investment Requirements - Capital Costs**

| Option | Description | Unit Capital Cost Tk/capita | 2000 | 2005 | 2010 | 2025 | 2050 |
|---|---|---|---|---|---|---|---|
| | Total population | | 9,780,000 | 12,220,000 | 14,910,000 | 24,980,000 | 46,900,000 |
| | | | | **TkM** | **TkM** | **TkM** | **TkM** |
| N3.2.1 | Mini Tara + arsenic filter in existing HTW | 157 | | 192 | 0 | 0 | 0 |
| N3.2.2 | FM hand pump (local Tara) with new HTW | 180 | | 22 | 0 | 0 | 0 |
| N3.2.3 | Mini Tara in existing HTW | 360 | | 53 | 19 | 0 | 0 |
| N3.9 | Urban piped supply from SW | 2,644 | | 840 | 2,327 | 2,663 | 5,796 |
| N3.10.1 | Urban piped supply from DTW + IRP | 2,063 | | 503 | 555 | 4,654 | 11,621 |
| N3.10.2 | Urban piped supply from DTW | 1,080 | | 1,055 | 581 | 4,873 | 7,102 |
| N3.11.1 | Peri urban mini DTW + IRP +distribution | 1,314 | | 353 | 1,477 | 1,323 | 0 |
| N3.11.2 | Peri urban mini DTW + distribution | 967 | | 345 | 2,529 | 3,155 | 5,299 |
| N3.12 | Community level WS (slum) | 55 | | 74 | 22 | 14 | 121 |
| | **Total Incremental Capital Cost** | | | **3,437** | **7,511** | **16,682** | **29,938** |
| | **Total Cumulative Capital Cost** | | | **3,437** | **10,948** | **27,630** | **57,569** |

**Note:** Considering that Option N3.2.1 provides water for drinking only in arsenic affected areas and an HTW may not be existing closeby to meet the other water needs, Option N3.2.2 is provided (equal to 10% (No.) of the N3.2.1 coverage) to take care of any shortfall.

**Small Town Water Supplies (<50,000 in 2025)** **Coverage Targets (%)**

| Option | Description | Total Annual Cost (Tk/m$^3$) | 2000 | 2005 | 2010 | 2025 | 2050 |
|---|---|---|---|---|---|---|---|
| | Total population | | 4,190,000 | 5,240,000 | 6,390,000 | 10,710,000 | 20,100,000 |
| | Existing HTWs | | 80% | 35% | 25% | 5% | 0% |
| N3.2.1 | Mini Tara + arsenic filter in existing HTW | 17.00 | 0% | 30% | 5% | 0% | 0% |
| N3.2.2 | FM hand pump (local Tara) with new HTW | 1.33 | 0% | 0% | 0% | 0% | 0% |
| N3.2.3 | Mini Tara in existing HTW | 2.65 | 1% | 5% | 10% | 5% | 0% |
| N3.5 | Existing HTW + Household arsenic removal | 25.00 | 1% | 10% | 0% | 0% | 0% |
| N3.11.1 | Peri urban mini DTW + IRP +distribution | 6.11 | 0% | 2% | 10% | 20% | 10% |
| N3.11.2 | Peri urban mini DTW + distribution | 5.01 | 0% | 3% | 20% | 40% | 20% |
| N3.9 | Urban piped supply from SW | 7.82 | 0% | 0% | 0% | 5% | 15% |
| N3.10.1 | Urban piped supply from DTW + IRP | 5.73 | 0% | 5% | 10% | 10% | 20% |
| N3.10.2 | Urban piped supply from DTW | 3.51 | 0% | 10% | 20% | 15% | 35% |
| | | | | | | | 0% |
| | | | **82%** | **100%** | **100%** | **100%** | 100% |

**Small Town Water Supplies (<50,000 in 2025)** **Coverage Targets - Number of Population**

| Option | Description | 2000 | 2005 | 2010 | 2025 | 2050 |
|---|---|---|---|---|---|---|
| | Total population | 4,190,000 | 5,240,000 | 6,390,000 | 10,710,000 | 20,100,000 |
| | | 3,352,000 | 1,834,000 | 1,597,500 | 535,500 | 0 |
| N3.2.1 | Mini Tara + arsenic filter in existing HTW | 0 | 1,572,000 | 319,500 | 0 | 0 |
| N3.2.2 | FM hand pump (local Tara) with new HTW | 0 | 0 | 0 | 0 | 0 |
| N3.2.3 | Mini Tara in existing HTW | 41,900 | 262,000 | 639,000 | 535,500 | 0 |
| N3.5 | Existing HTW + Household arsenic removal | 41,900 | 524,000 | 0 | 0 | 0 |
| N3.11.1 | Peri urban mini DTW + IRP +distribution | 4,190 | 104,800 | 639,000 | 2,142,000 | 2,010,000 |
| N3.11.2 | Peri urban mini DTW + distribution | 0 | 157,200 | 1,278,000 | 4,284,000 | 4,020,000 |
| N3.9 | Urban piped supply from SW | 0 | 0 | 0 | 535,500 | 3,015,000 |
| N3.10.1 | Urban piped supply from DTW + IRP | 0 | 262,000 | 639,000 | 1,071,000 | 4,020,000 |
| N3.10.2 | Urban piped supply from DTW | 0 | 524,000 | 1,278,000 | 1,606,500 | 7,035,000 |
| | | 3,439,990 | 5,240,000 | 6,390,000 | 10,710,000 | 20,100,000 |

**Small Town Water Supplies (<50,000 in 2025)** **Incremental Coverage Targets - Number of Population**

| Option | Description | 2000 | 2005 | 2010 | 2025 | 2050 |
|---|---|---|---|---|---|---|
| | Total population | 4,190,000 | 104,800,000 | 107,100,000 | 107,700,000 | 88,000,000 |
| | Existing HTWs | | -1,518,000 | -236,500 | -1,062,000 | -535,500 |
| N3.2.1 | Mini Tara + arsenic filter in existing HTW | | 1,572,000 | -1,252,500 | -319,500 | 0 |
| N3.2.2 | FM hand pump (local Tara) with new HTW | | 0 | 0 | 0 | 0 |
| N3.2.3 | Mini Tara in existing HTW | | 220,100 | 377,000 | -103,500 | -535,500 |
| N3.5 | Existing HTW + Household arsenic removal | | 482,100 | -524,000 | 0 | 0 |
| N3.11.1 | Peri urban mini DTW + IRP +distribution | | 100,610 | 534,200 | 1,503,000 | -132,000 |
| N3.11.2 | Peri urban mini DTW + distribution | | 157,200 | 1,120,800 | 3,006,000 | -264,000 |
| N3.9 | Urban piped supply from SW | | 0 | 0 | 535,500 | 2,479,500 |
| N3.10.1 | Urban piped supply from DTW + IRP | | 262,000 | 377,000 | 432,000 | 2,949,000 |
| N3.10.2 | Urban piped supply from DTW | | 524,000 | 754,000 | 328,500 | 5,428,500 |
| | | | 1,800,010 | 1,150,000 | 4,320,000 | 9,390,000 |

**Small Town Water Supplies (<50,000 in 2025)** **Incremental Investment Requirements - Number of Population**

| Option | Description | 2000 | 2005 | 2010 | 2025 | 2050 |
|---|---|---|---|---|---|---|
| | Total population | 4,190,000 | 5,240,000 | 6,390,000 | 10,710,000 | 20,100,000 |
| | Existing HTWs | | 0 | 0 | 0 | 0 |
| N3.2.1 | Mini Tara + arsenic filter in existing HTW | | 1,572,000 | 0 | 0 | 0 |
| N3.2.2 | FM hand pump (local Tara) with new HTW | | 0 | 0 | 0 | 0 |
| N3.2.3 | Mini Tara in existing HTW | | 220,100 | 377,000 | 0 | 0 |
| N3.5 | Existing HTW + Household arsenic removal | | 482,100 | 0 | 0 | 0 |
| N3.11.1 | Peri urban mini DTW + IRP +distribution | | 100,610 | 534,200 | 1,503,000 | 0 |
| N3.11.2 | Peri urban mini DTW + distribution | | 157,200 | 1,120,800 | 3,006,000 | 0 |
| N3.9 | Urban piped supply from SW | | 0 | 0 | 535,500 | 2,479,500 |
| N3.10.1 | Urban piped supply from DTW + IRP | | 262,000 | 377,000 | 432,000 | 2,949,000 |
| N3.10.2 | Urban piped supply from DTW | | 524,000 | 754,000 | 328,500 | 5,428,500 |
| | | | 3,318,010 | 3,163,000 | 5,805,000 | 10,857,000 |

**Small Town Water Supplies (<50,000 in 2025)** **Incremental Investment Requirements - Capital Costs**

| Option | Description | Unit Capital Cost Tk/capita | 2000 | 2005 | 2010 | 2025 | 2050 |
|---|---|---|---|---|---|---|---|
| | Total population | | 4,190,000 | 5,240,000 | 6,390,000 | 10,710,000 | 20,100,000 |
| | | | | **TkM** | **TkM** | **TkM** | **TkM** |
| N3.2.1 | Mini Tara + arsenic filter in existing HTW | 157 | | 247 | 0 | 0 | 0 |
| N3.2.2 | FM hand pump (local Tara) with new HTW | 180 | | 28 | 0 | 0 | 0 |
| N3.2.3 | Mini Tara in existing HTW | 360 | | 79 | 136 | 0 | 0 |
| N3.5 | Existing HTW + Household arsenic removal | 128 | | 62 | 0 | 0 | 0 |
| N3.11.1 | Peri urban mini DTW + IRP +distribution | 1,314 | | 132 | 702 | 1,975 | 0 |
| N3.11.2 | Peri urban mini DTW + distribution | 967 | | 152 | 1,084 | 2,907 | 0 |
| N3.9 | Urban piped supply from SW | 2,644 | | 0 | 0 | 1,416 | 6,556 |
| N3.10.1 | Urban piped supply from DTW + IRP | 2,063 | | 541 | 778 | 891 | 6,084 |
| N3.10.2 | Urban piped supply from DTW | 1,080 | | 566 | 814 | 355 | 5,863 |
| | **Total Incremental Capital Cost** | | | **1,807** | **3,514** | **7,544** | **18,502** |
| | **Total Cumulative Capital Cost** | | | **1,807** | **5,320** | **12,864** | **31,366** |

**Note:** Considering that Option N3.2.1 provides water for drinking only in arsenic affected areas and an HTW may not be existing closeby to meet the other water needs, Option N3.2.2 is provided (equal to 10% (No.) of the N3.2.1 coverage) to take care of any shortfall.