# DATA TRANSMISSION AND VILLAGE WATER PLAN UPDATE PROTOCOL

**Background**

GSDA and UNICEF are engaged in an exercise to maintain and update village level water budgets and plans for about 100 villages in Latur and Chandrapur districts. This plan will help (i) monitoring agencies in assessing water security, and (ii) villages to manage water resource so that scarcity is avoided. Both these objectives are achieved via a village water budget. The format of this budget has already been developed and includes various aspects such as sources and strengths, demand, cropping patterns and so on. The plan requires both static, such as population, land-holdings, etc., and dynamic data such as well water levels, rainfall and so on. This dynamic data is periodically observed and monitored. The plan for the year is to be updated based on this key data.

**Goals and Objectives**

The objective of the project is (i) to design and implement hand-held devices (such as mobile phones) and formats for the transmission of observed data to central repositories, and (ii) to implement repository structure which will house village water plans, data and so on, and to supply updates and reports for the village and other monitoring agencies.

**Methodology**

The CTARA team will execute the following protocol:

1. Visit key field locations to assess techno-economic parameters such as mobile coverage, expertise of village level workers, nature of data obtained.
2. Study the village water budget plans and study the various updates and logging features in the plan.
3. Design and implement formats for the storage of data and plans in the repository.
4. Design and implement hand-held device and forms which will allow for the transmission and receipt of remotely observed data.
5. Design and implement repository structure and interfaces.
6. Handover the repository, the hand-held devices and their designs to GSDA and UNICEF for deployment.

See www.cse.iitb.ac.in/~karjat/unicef for additional material.

**Timelines**

Start Time: August 1st , 2011.

First Report: December 15th, 2011.

Final Report: February 1st, 2012.

**Expenses**

| | | | |
|---|---|---|---|
| **A** | **Salaries and Wages** | | |
| | 1 Engineer | @30,000 p.m. *4 months | 1.2 lakhs |
| | 1 Designer | @60,000 p.m. *4 months | 2.4 lakhs |
| | Faculty Time | @30,000 p.d. *16 days | 4.8 lakhs |
| | ***Sub-Total of A*** | | ***8.4 lakhs*** |
| **B** | **Equipment** | | |
| | Mobile Devices and recievers | | 1.0 lakhs |
| | GPS | | 0.2 lakhs |
| | Server | | 1.0 lakhs |
| | ***Sub-Total of B*** | | ***2.2 lakhs*** |
| **C** | **Other expenses** | | |
| | Travel | | 1.0 lakhs |
| | Documentation | | 0.5 lakhs |
| | ***Sub-Total of C*** | | 1.5 lakhs |
| | **Total** | | **12.1 lakhs** |
| | Institute Overheads | | 2.4 lakhs |
| | **Grand Total** | | **14.5 lakhs** |

## ANALYSIS OF THE ANJAP-SUGAVE MULTI-VILLAGE DRINKING WATER SCHEME

**Background**

Multi-village schemes (MVS) form an important protocol for drinking water provisioning, esp. where bulk water transfer is required. However, these schemes are prone to institutional and financial stress. Of the 900-odd MVSs in Maharashtra, about 600 have been transferred to user groups. Of these, barring a 100 or so, most are under some stress, either technical, financial or institutional. Since the MVS is, in certain situations, a necessity, improving the performance of MVSs is an important objective. This will involve studying the various aspects of the process of design and implementation of MVSs, its operational parts, and the hand-over from MJP/implementation agency to the Zilla parishad/user groups.

CTARA has been actively studying the Anjap-Sugave MVS in Karjat taluka, Raigad district. This scheme was initially mooted in 1996 and has about 6000 beneficiaries spread over 14 hamlets, mostly (but not completely) from Boriwali GP. The initial planned outlay was of Rs. 2.34 crores and work began in 1988. However, to this day, the scheme is only partially complete and is operated seasonally by MJP. Recently, an additional amount of Rs. 96 lakhs has been sanctioned to complete the scheme and to extend the tertiary network in the hamlets.

**Goals and Objectives**

The study hopes to outline a process of recovery and revival of MVSs and to move then towards sustainability. The concrete objectives of the project is to work on the Anjap-Sugave MVS and to

(i) give an accurate status report of the technical assets in place, designs, weaknesses and strengths, operational issues and so on.
(ii) survey the beneficiary villages and outline the status of service and scarcity of drinking water.
(iii) assess the socio-economic and institutional issues involved in the hand-over of the scheme to user groups.
(iv) make recommendations and develop a multi-stakeholder platform which will ease the hand-over process.

**Methodology**

The CTARA team will execute the following protocol:

1. Along with MJP, perform a technical assessment of the system. This will involve a field survey, re-design and simulation, validation and so on.
2. Work with the habitations and elected representatives and assess willingness to participate, pay, own and run the scheme.

A. Work with the contractor and assess current operations, including daily schedules and actual delivery of water.

3. Produce a wish-list from all stake-holders, and develop a plan for the hand-over.

**Timelines**

Start Time: August 1st, 2011.
First Report: December 15th, 2011.
Final Report: February 1st, 2012.

**Expenses**

| | | | |
|---|---|---|---|
| **A** | **Salaries and Wages** | | |
| | 1 Engineer | @30,000 p.m. *4 months | 1.2 lakhs |
| | 1 Social Sc | @30,000 p.m. *4 months | 1.2 lakhs |
| | 0.5 Designer | @60,000 p.m. *4 months | 1.2 lakhs |
| | Faculty Time | @30,000 p.d. *10 days | 3.0 lakhs |
| | ***Sub-Total of A*** | | ***6.6 lakhs*** |
| **B** | **Equipment** | | |
| | GPS | | 0.2 lakhs |
| | Laptop | | 0.5 lakhs |
| | ***Sub-Total of B*** | | ***0.7 lakhs*** |
| **C** | **Other expenses** | | |
| | Travel | | 1.0 lakhs |
| | Documentation | | 0.5 lakhs |
| | ***Sub-Total of C*** | | 1.5 lakhs |
| | **Total** | | **8.8 lakhs** |
| | Institute Overheads | | 1.7 lakhs |
| | **Grand Total** | | **10.5 lakhs** |

## ANALYSIS OF DRINKING WATER STRESS IN THANE DISTRICT

**Background**

Drinking water security is an important mandate for every administration and many schemes exist for developing this at every habitation. Some of these are the Bharat Nirman and the Jalswarajya protocol for implementing (typically single-village) schemes for habitations. However, in spite of best intentions and regular monitoring, some habitations slip back into stress and scarcity. It is then important to assess the reasons for this slip-back, especially of the persistent and repeated cases so that the exact causes and patterns of failure are understood. This will help in designing alternate interventions, and also modifying the formats of existing schemes so as to make them more robust.

CTARA has been working on rural drinking water for the past several years. One such study was in 2007 of Jalswarajya schemes in Thane. This study plans to complement and update that study. We propose to do a factor analysis of all the 163 persistent water scarcity villages as of 2011. We will investigate groundwater availability, village action plans, engineering and institutional aspects to come up with a diagnostic.

**Goals and Objectives**

The objectives of the project is to analyse the causes behind the persistent water scarcity in 163 villages, and to recommend possible interventions.

**Methodology**

The CTARA team will execute the following protocol:

1. Obtain and collate all official data on the 163 habitations.
2. Use a GIS tool to represent this data and compare it with GSDA data on the same.
3. Segregate and analyse failure cases by history, type of scheme, nature of failure and so on.
4. Develop field studies of individual representative cases.
5. Corroborate and analyse field data and do cause-analysis.
6. Design policy and technical interventions if required.

**Timelines**

Start Time: September 1st, 2011.
First Report: January 15th, 2011.
Final Report: February 15th, 2012.

**Expenses**

| | | | |
|---|---|---|---|
| **A** | **Salaries and Wages** | | |
| | 1 Engineer | @30,000 p.m. *4 months | 1.2 lakhs |
| | 1 Social Sc | @30,000 p.m. *4 months | 1.2 lakhs |
| | 0.5 Designer | @60,000 p.m. *4 months | 1.2 lakhs |
| | Faculty Time | @30,000 p.d. *10 days | 3.0 lakhs |
| | ***Sub-Total of A*** | | ***6.6 lakhs*** |
| **B** | **Equipment** | | |
| | GPS | | 0.2 lakhs |
| | Laptop | | 0.5 lakhs |
| | ***Sub-Total of B*** | | ***0.7 lakhs*** |
| **C** | **Other expenses** | | |
| | Travel | | 1.5 lakhs |
| | Documentation | | 0.5 lakhs |
| | ***Sub-Total of C*** | | 2.0 lakhs |
| | **Total** | | **9.3 lakhs** |
| | Institute Overheads | | 1.9 lakhs |
| | **Grand Total** | | **11.2 lakhs** |

## ANALYSIS OF GROUNDWATER DATA FOR THANE DISTRICT

**Background**

GSDA has been recording groundwater data for all districts of Maharashtra for over 30 years now. This repository must serve as a useful platform for assessing groundwater potential and usage, and for critical uses such as planning drinking water schemes. New statistical testing, data mining and GIS representation techniques are now available which need to be applied to this data. Such an application would yield significant outputs such as validation of observation well data, better understanding of seasonality and water table, connections and relationships between different regions vis-a-vis groundwater. This would require considerable mathematical skills coupled with the building of GIS models.

The project intends to develop such a knowledge base for Thane district. This would feed into the planning regime for the district and give a sharper focus to groundwater availability across the district. Initially, the analysis will be based purely on the observation well data, and eventually, in future phases, it will intergrate other data sets such as rainfall, land-use and so on.

**Goals and Objectives**

The objectives of the project is to develop an analysis of the observation well data for Thane district towards (i) validation, (ii) local seasonal models, and (iii) regional seasonal model with interactions and connections.

**Methodology**

The objectives will be achieved through the following steps.

1. First analysis and validation checks.
2. Stationary-time seasonal models for individual wells and issues therein, such as dry-wells, outliers and so on.
3. Regional GIS framework and database.
4. Development of the regional stationary-time model.
5. Research: Models with drift.

**Timelines**

Start Time: August 15th, 2011.
First Report: January 30th, 2012.
Final Report: February 28th, 2012.

**Expenses**

| | | | |
|---|---|---|---|
| **A** | **Salaries and Wages** | | |
| | 1 Engineer | @30,000 p.m. *4 months | 1.2 lakhs |
| | 0.5 Designer | @60,000 p.m. *4 months | 1.2 lakhs |
| | Faculty Time | @30,000 p.d. *10 days | 3.0 lakhs |
| | ***Sub-Total of A*** | | ***5.4 lakhs*** |
| **B** | **Equipment** | | |
| | Desktop | | 0.5 lakhs |
| | ***Sub-Total of B*** | | ***0.5 lakhs*** |
| **C** | **Other expenses** | | |
| | Travel | | 0.5 lakhs |
| | Documentation | | 0.5 lakhs |
| | ***Sub-Total of C*** | | 1.0 lakhs |
| | **Total** | | **6.9 lakhs** |
| | Institute Overheads | | 1.74lakhs |
| | **Grand Total** | | **8.3 lakhs** |