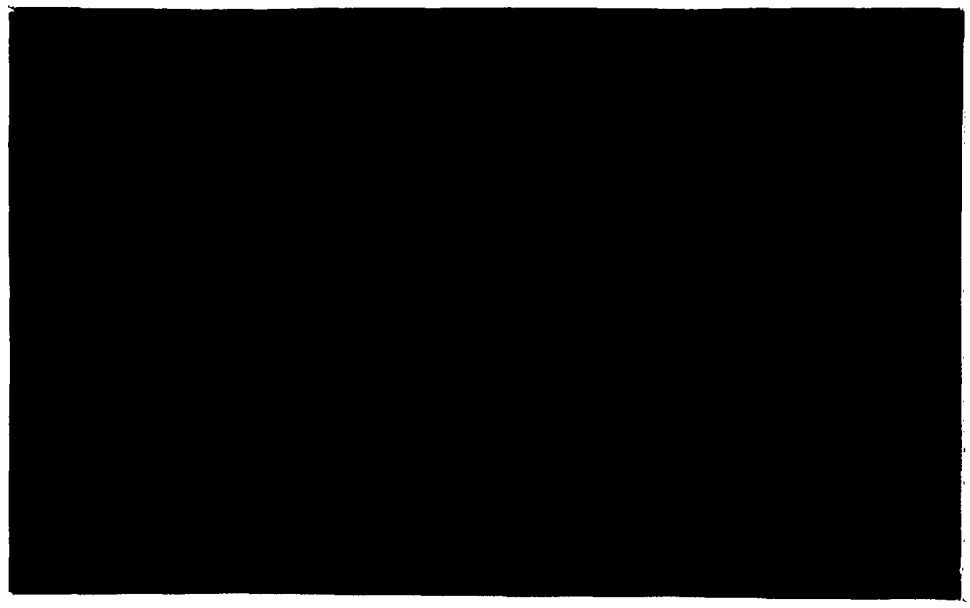
UNDP-
World Bank
Water and Sanitation Program



Regional Water and Sanitation Group - Eastern and Southern Africa (RWSG-ESA)

WSP-ESA Informal Paper

MIS of Community Based Santation in Addis Ababa

Prepared by:
Rodeco Consulting GmBH

Foreword

Like many other cities in the developing world, Ethiopia's capital - Addis Ababa has not been able to develop water supply and sanitation systems for providing satisfactory services to all her residents. Integrated city-wide systems have so far proved unaffordable and improvements of sanitary conditions, particularly for the poorer neighborhoods, are largely based on local solutions where the communities play a key role.

A series of steps have been taken by the Addis Ababa City Government (AACG, previously Region 14) to make themselves better equipped to deal systematically with Community Based Environmental Sanitation (CBES). The UNDP-World Bank Water and Sanitation Program (WSP) has been privileged to work in partnership with AACG on several of these steps.

Initial support work – comprehensive case studies and inventories of CBES projects - was carried out with funding from the Government of Italy. These studies identified lack of overview, scattered knowledge of project details and poor coordination as major shortcomings. The need for an adequate Management Information System (MIS), as well as a Monitoring and Evaluation System, are therefore obvious.

The present report was prepared by Rodeco Consulting GMBH. They provided their own specialist consultant on MIS development, and Ethiopian Omnitech designed the database systems. In addition, WSP hired a sociologist to define parameters relating to community and user aspects of CBES. The later will be integrated through additional modules and report formats in the final version.

The consultancy provided practical recommendations for the establishment of a city-wide database on CBES projects. The system development was brought to the point were simple test runs with sample report compilation could be made with actual data from a few projects. Implementation will start in the near future as the European Union has agreed to finance a major CBES program targeting the poorest neighborhoods of Addis Ababa.

The product prepared by Rodeco and Omnitech deserves to be shared with other cities. We have in the following reproduced Rodeco's report with only minor editorial changes.

Jean Doyen
Regional Manager WSP-ESA
Nairobi, July 26, 1999

Acknowledgements:
This report has been prepared with financial support from GTZ under an agreement with the UNDP-World Bank Water and Sanitation Program. It was supervised on behalf of WSP-ESA by Tore Lium, Sr. Water Sector Planner and Ato Belete Muluneh, Country Sector Advisor to Ethiopia.

Document production has been undertaken by Brazille Musumba, Njeri Gicheru and Jane Wachuga in our Nairobi office.

Contents

Background

The report highlights the results achieved during a short term mission of an MIS expert to Addis Ababa. This mission took place during October 26 and November 20, 1998. The project team during that period consisted of a German and an Ethiopian expert. Both experts closely cooperated with the Project Implementation Office (PIO) and its staff as well as the members of the Reference Group, a steering committee that was created to supervise and direct the progress of the project.

On October 27, 1998 the Reference Group convened within PIO to outline and discuss the terms of reference for the project. A first interim meeting was held on November 9, 1998 when the consultants presented their proposal for the data base design. The final design of the MIS/M&E and the recommendations of the team were presented to the Reference Group on November 19, 1998 together with the initial findings of the sociological survey.

On December 2, 1998, the result of the investigation of the ESRDF's MIS and the Land Information System (LIS) of the Urban Development and Works Bureau was presented and amendments of the design discussed. The recommendations of the sociological survey and the selected indicators for M&E module were also discussed. At this meetind a decision was reached to include:

- Monitoring and evaluation modules both int he design and the pilot system
- Specification for data transfer modules from both the LIS and ESRDF's MIS

The final Darft Report was presented on december 14,1998 and the pilot system with the additional O&M module demonstrated.

Requirements for the new system interms of software, hardware and training specifications are fine tuned through this iterative process. Finaly cost and time estimates were derived and implementation schedule derived.

The report is orgnized according to the sequence of activities carried out by the consultants. The results of the analysis, design and requirment specifications are presented in detail. The description of the prototype software is to be regarded as part of the design specification.

1 Introduction

The issue of sanitation is one of the crucial problems of the city of Addis Ababa. Though efforts have been made in the past to address the problem through various governmental, non-governmental and international organisations the efforts made so far lacked proper planning, co-ordination and integration. To improve the present situation the establishment of a MIS/M&E and information network within the AACA has been recommended to store, evaluate, process, disseminate and share valuable information and experience on the issue of sanitation.

1.1 Agreed scope of work

The overall objective agreed upon was to develop a comprehensive yet practical MIS/M&E to enable:

- Management decisions,
- Assessment of service situation,
- Evaluation of experience,
- Improvement of approaches.

In order to fullfill these objectives the consultants followed a methodical approach.

1.2 Approach

Analysis

The objective of the analysis phase was to identify categories of system beneficiaries (users/actors), current problems and the requirements for the new system. Accordingly by reviewing relevant documents and interviewing selected people, the consultants:

- Identification of key users/actors,
- Analysis of their core management and administrative processes (i.e. funding, planning, implementing and operating & maintaining} and their current problems,
- Derivation of the information needed/required by users to decide and act properly.

Design

Once existing problems and future requirements were identified the main tasks of the next phase was:

- Designing a basic MIS/M&E that will provide the necessary support.
- Developing a pilot system
- Fine tuning the design

In order to fullfill these objectives the consultants:

- Reviewed the CERFE case study and other material (list of reviewed documents is given in the annex)
- Studied similar government based MIS activities.
- Consulted with all relevant actors (e.g. Reference Group members).
- Analysed core administrative processes and defined user requirements (list of interviews held is given in the annex).
- Identified information needed for continuous monitoring.
- Designed the system (simple & sustainable) on a modular basis using standard software packages.

- Developed a pilot system, pre-tested the system for selected data and actors and demonstrated the pilot system.
- Prepared a proposal for the procurement of the necessary equipment and the implementation of the system.

2 Analysis

2.1 Current Problems

The observed limitations of CBES projects were (source: CERFE Case Study):

- Excessive fragmentation (23 NGOs, 19 government bodies).
- Unbalanced distribution (territorial and sectoral).
- Unsatisfactory technical quality.
- Lack of participation and complex organisation of O&M.
- Disparity between mobilisation of resources and No. Of beneficiaries.
- Loose linkages with local and central government.

It has been, therefore, recommended to institute stable interconnections between all actors in order to improve the overall impact. The formation of a central clearing body is only one measure to coordinate CBES activities, in addition all information should be channelled, stored and shared through adequate computer facilities.

2.2 Special issues of particular interest

The following points were deemed important and are incorporated in the design consideration:

- Institutional options for the project organisation, i.e. committees of beneficiaries.
- People participation through all project phases.
- Technological suitability.
- Cost recovery from beneficiaries.
- Sustainability.

Source: CERFE Case Study

2.3 Investigative approach: Definition of user requirements

The various actors engaged in CBES projects are the relevant users that require MIS/M&E support for their core adminstrative and mangement processes (see figure below) in policy making, planning, implementation and operation and maintenance.

In order to determine user requirements, involvement of actors in the various rolls such as funding (Donor), palanning and monitoring (PM), planinng (P), implementaion (I) and operation & maintenance is analysed (figure 2.2).

The diferent processes, i.e, funding, planning, planning/implementing and operations were studied for some reperesentative organization (figures 2.4.-2.7) in order to determine the major activities of the processes. Once this is done, activity based information and information requirements by actor group were determined. As an example of information requirement for project appraisal within PIOis also presented.

Figure 2.1: Definition of user requirements

PIO
Health Burau
Others

Policy making/
Planning
Implementation
Operation&
Maintenance

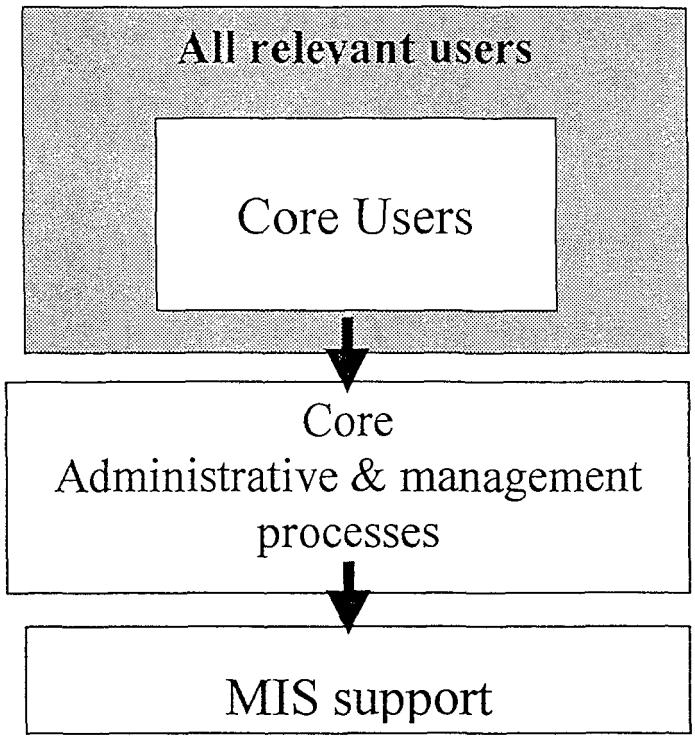


Figure 2.2: Involvement of actors

Actor	Type	Donor	PM/P	I	O&M
CARE Ethiopia	NGO	x	x	x	
UNICEF	NGO	x		(x)	
Ethiopian Social Rehab. Development Fund	F/R	x			
A.A. Road Authority	R		x	x	x
Environmental Development Project Office	R		x	(x)	
Health Bureau	R		x	x	x
Foreign Relations & Dev. Cooperation Bureau	R		x		
Project Implementation Office	R		x		
Environmental Protection Bureau	R		(x)		
A.A. Water and Sewerage Authority	R				x
NGO Urban Working Group within CRDA	NGO	?	?	?	?
Urban Development Works Bureau	R				
Urban Development Support Service	F				
Community Based Organisations	CBO		x	x	x

F = federal; R = regional; x = active; (x) = partly active

Figure 2.3: Categories of actors

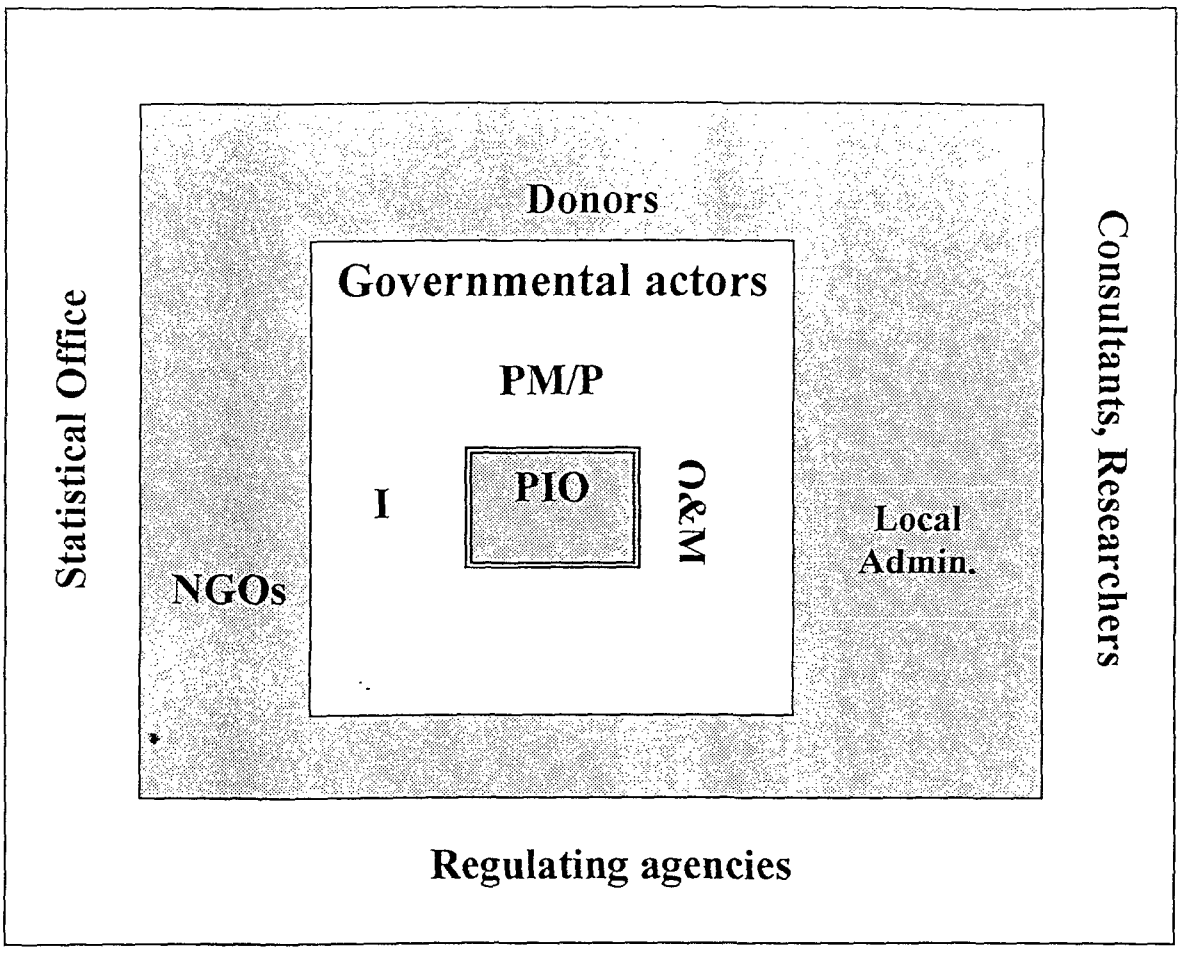


Figure 2.4: Funding process of ESRDF

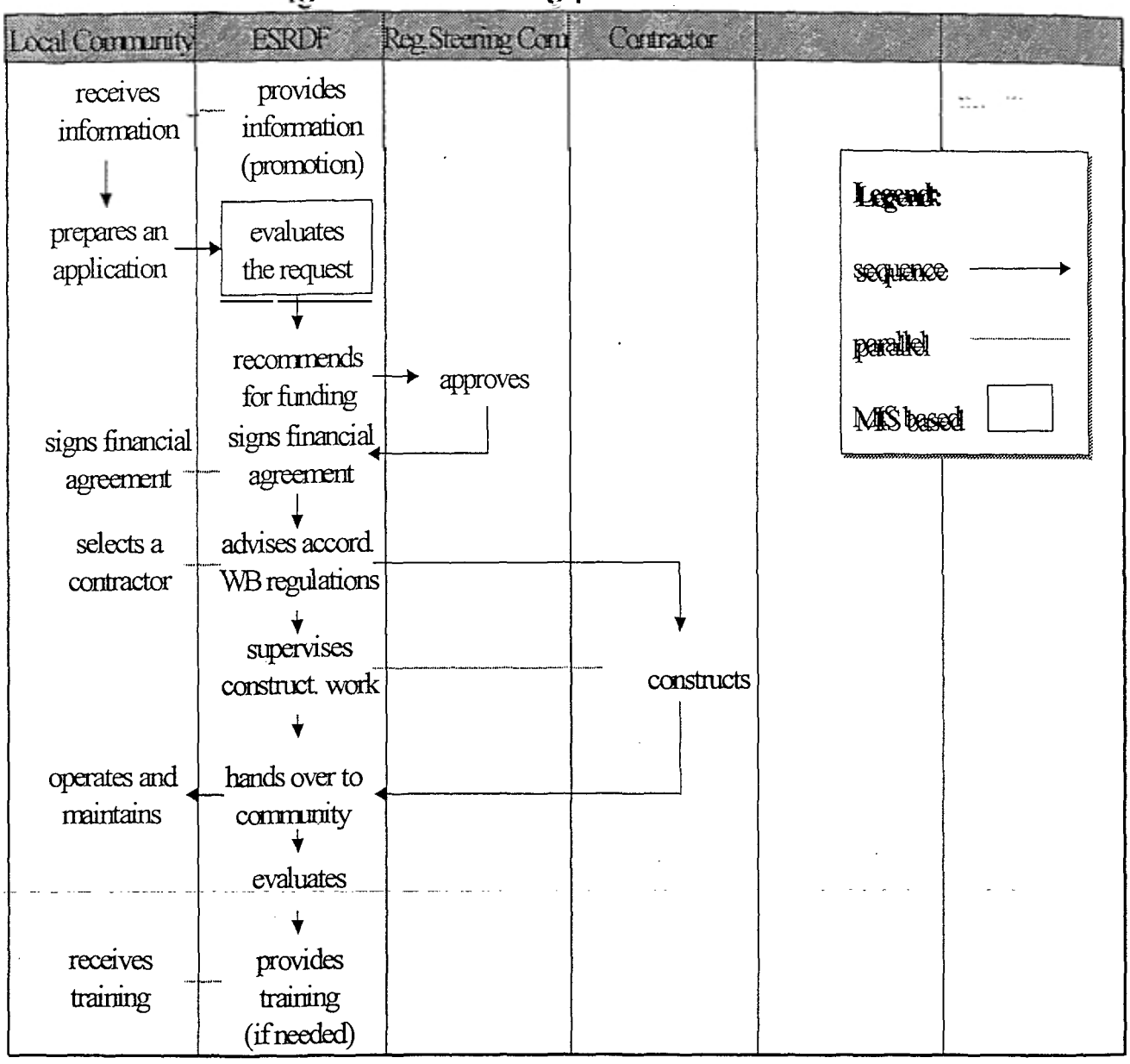


Figure 2.5: Planning Process of PIO

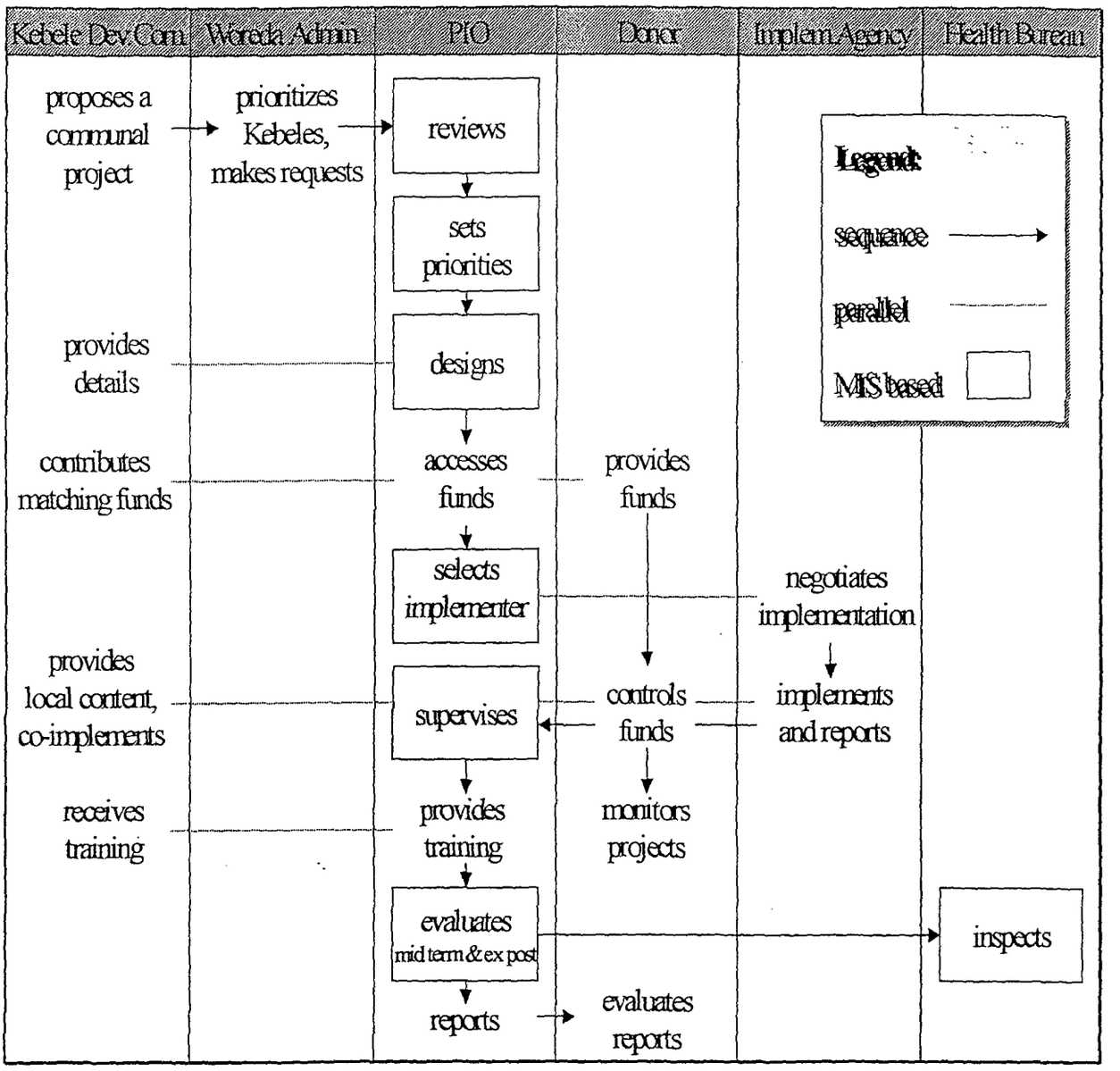


Figure 2.6: Planning/Impl. Process Env.Dev.Project Office

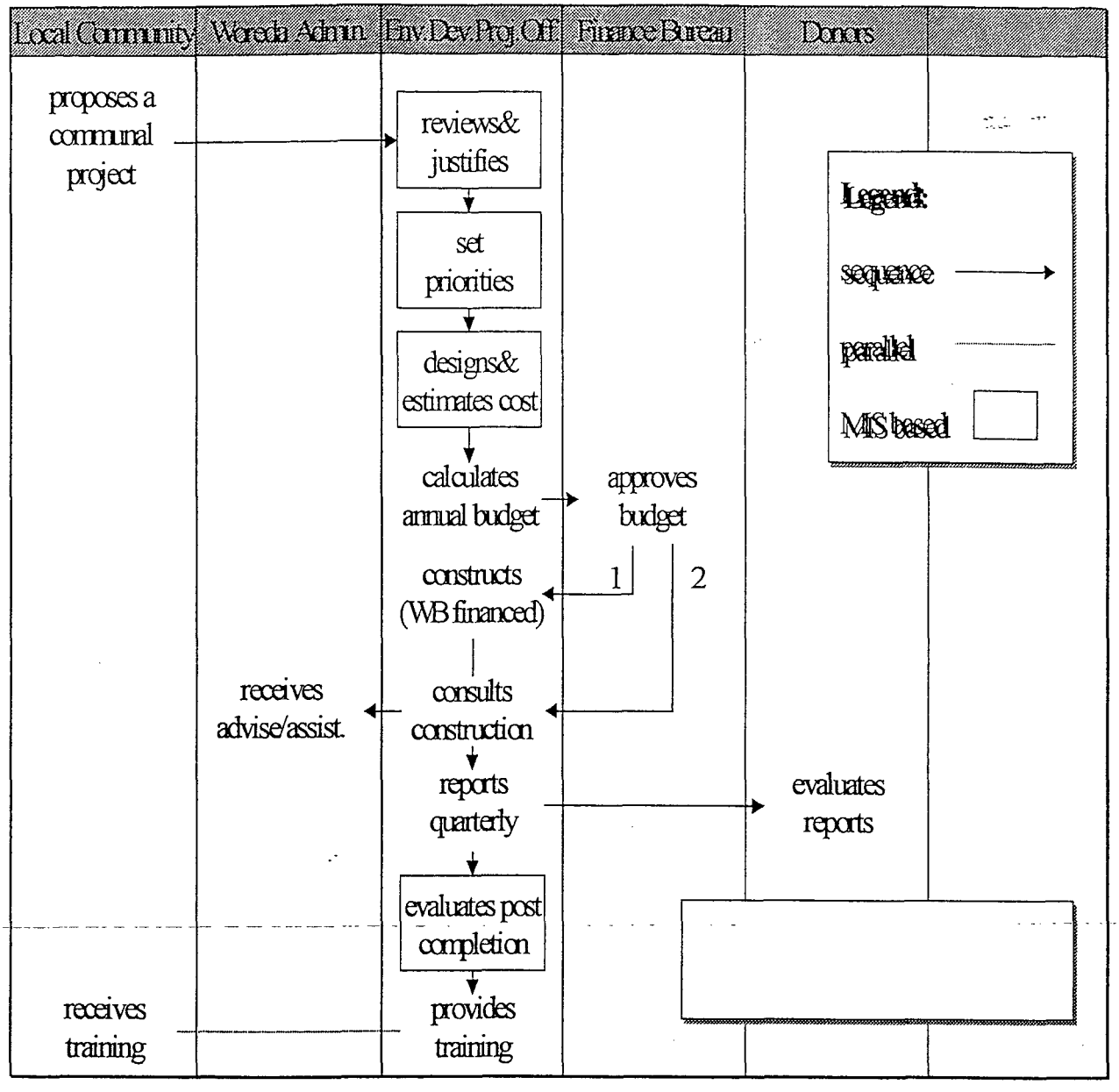
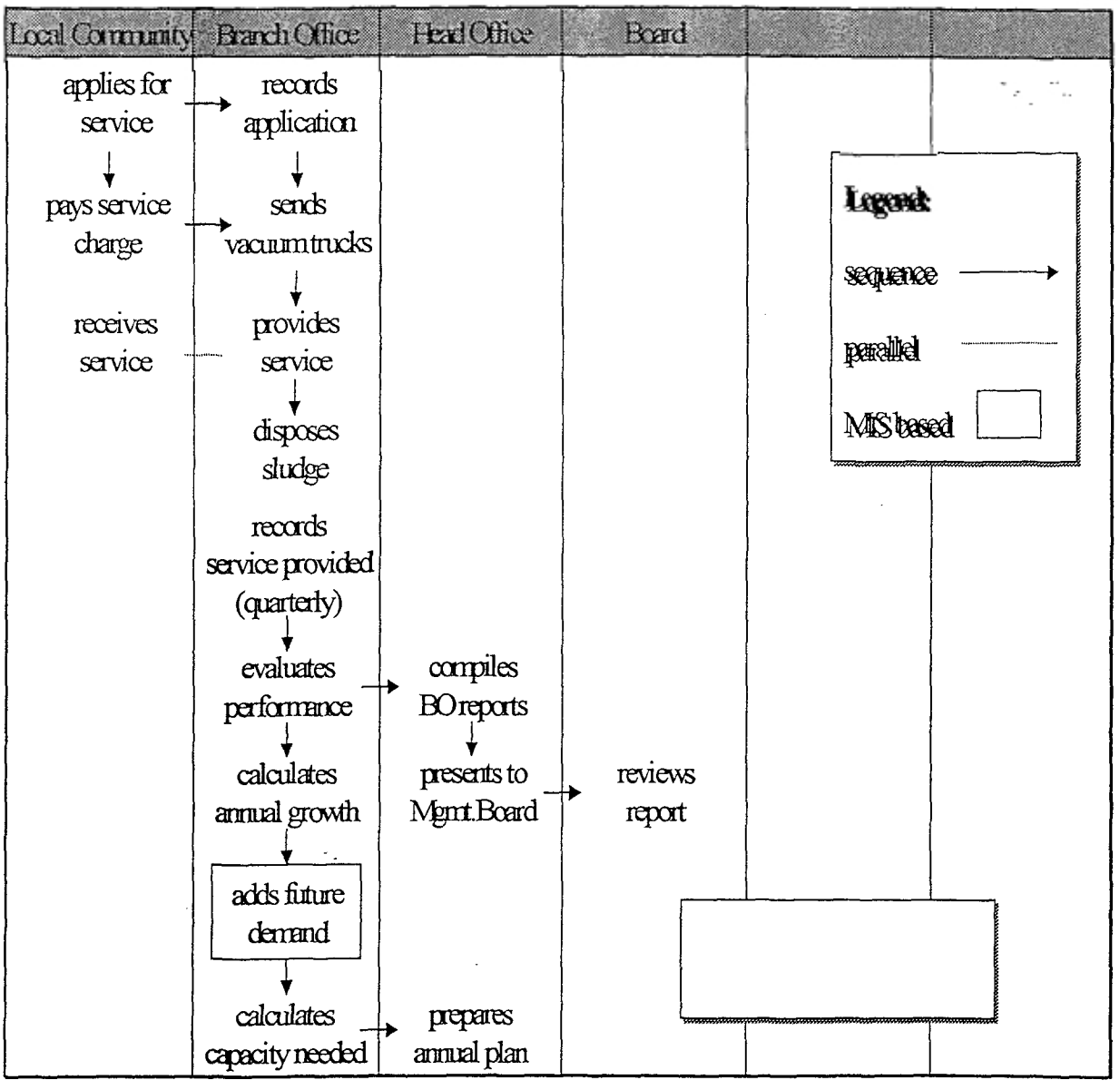


Figure 2.7: Operations Process A.A.W&SA



2.4 Activity based information requirement specification

Major activities	Project details & project group summaries	Infrastructure details per sector	Location characteristics and provision with services/ projects	Activities of donors by sector and location	Activities of planning agencies by sector and location	Activities of implementing agencies by sector and location
Request appraisal	x	x	X	x		
Project prioritisation	x	x	X	x		x
Design & cost estimates	x	x	X		X	
Selection of implementers	x		X			x
Supervision of implementers	x		X			x
Evaluation of progress	x		X			
Inspection	x		X			
Operation capacity determination	x	x	X			
Post completion evaluation	x	x	X			

2.5 Information requirement by group of actors

Information	Donor	PM/P	I	O&M	Local Admin.
Project details and project group (sectors) summaries	(x)	X	x	X	x
Infrastructure details per sector		X	x	X	x
Location (Kebele) characteristics and their provision with services/projects	x	X		X	x
Activities of donors by sector and location	x	X			x
Activities of planning agencies by sector and location		X			x
Activities of implementing agencies by sector and location		X	(x)		x

2.5.1 Example: Project appraisal within PIO

	Selection criteria	Information required
1.	Equal distribution of activities within Woredas	Provision of services by Kebeles/Woredas
2.	Sole implementer in this sector	Activities of implementing agencies....
3.	Degree of sanitary services in place	Location characteristics
4.	Provision of skilled labour	Location characteristics
5.	Contribution of local community	Location characteristics
6.	.....	
7.	.....	

2.6 Investigation of similar government based MIS activities

2.6.1 ESRDF's Database

Purpose	Accounting (impact encore as a standard package) Project Management (tailor-made, 15 modules)
Hardware	80 clients and servers (PCs), 13 laptops, 40 printers
Software	Visual Basic 5.0, Windows 95
Data Base	MS-Access 7.0
NetWare	Windows NT, WAN in regions
Communication	Off-line (diskettes), dedicated lines (planned)
SW-Development	Start: 8/95; Pilot system: 3/96; Completion: 12/98
Development cost	US $ 213.000
Operating cost	80.000 Birr/year for HW-maintenance 4 dedicated experts in Central Office
Present status	Local consultant to be selected for preparation of requirement plan
Remarks	Printed reports are shared with other actors. System seems to be very comprehensive and ambitious.

Contents of the Database

- Project Title
- Date of Approval
- Project Category Code
- Location (Region) Code
- Location (Zone) Code
- Location (Woreda) Code
- Location (Kebele) Code
- Status Code
- ESRDF Contribution
- Community Contribution
- Other Contributions
- Requesting Community/Agency
- Beneficiaries Type (VA,KA,KD,WA,UA,TC)
- Beneficiaries Number (Male)
- Beneficiaries Number (Female)
- Four Lines of Description for the work to be undertaken
- Implementing Agency
- Date Actual Work Started
- Date Actual Work Completed

2.6.2 Land Information System (LIS) within UDWB

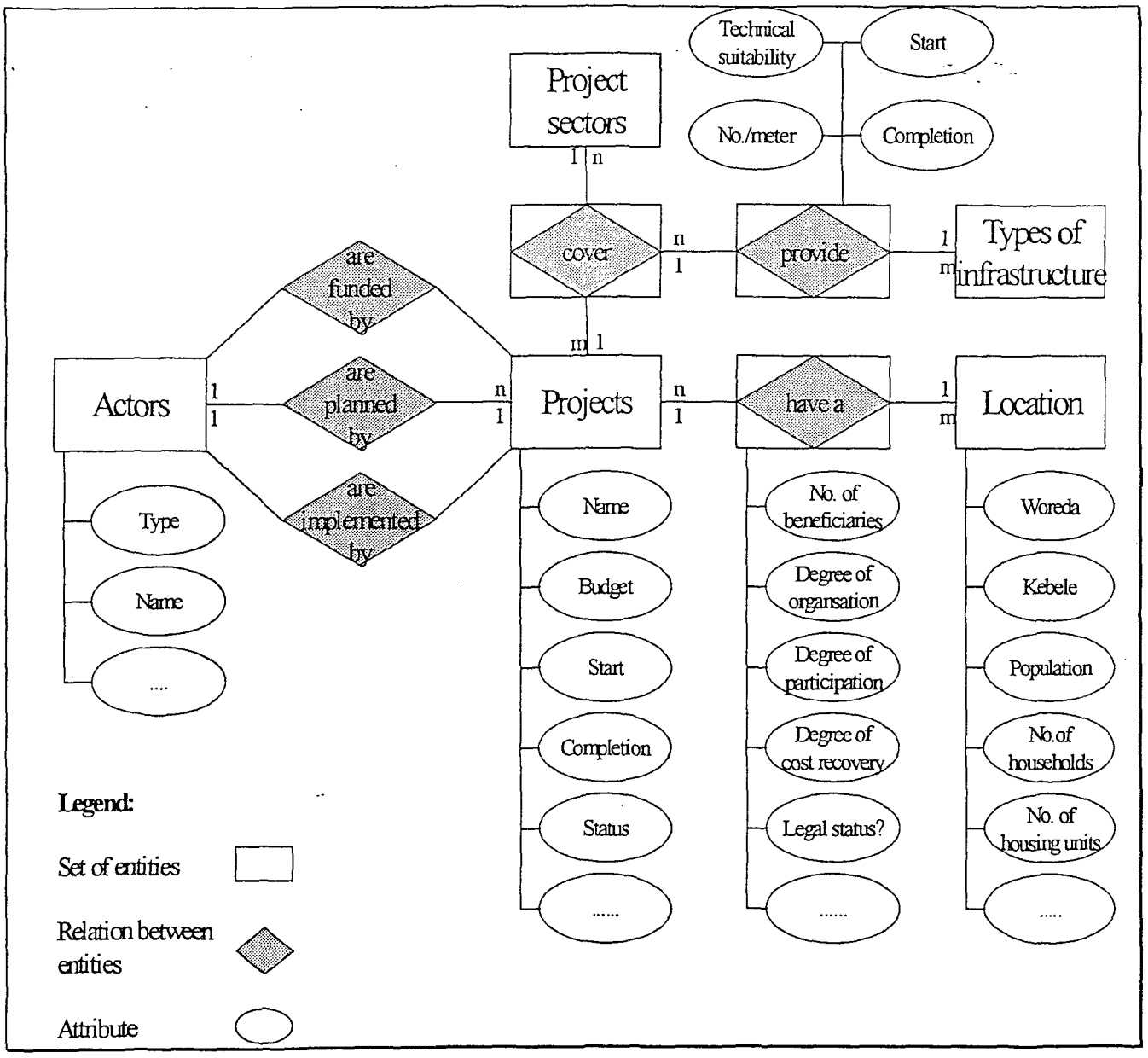
Purpose	Land administration, land use planning etc.
Hardware	50 PCs, 5 Digitizers, 13 printers, 2 A0 size plotters, 2 scanners
Software	Archinfo, Archview, Autocad plus tailor-made application
Data Base	FoxPro
NetWare	Stand alone (at present), network (planned)
	Printed reports
SW-Development	Start: 9/94; Data entry: 1996; Completion: ??
Development cost	17 Mill. Birr including data collection
Operating cost	Still under warranty
Present status	Working properly
Remarks	- Data are very complementary to the planned MIS/M&E - Project data from PIO needed to update data base

- The system identifies each housing unit by:
  - House Number
  - Parcel Number (to identify land ownership)
  - Block Number
  - Kebele
  - Woreda
- Other attributes ranging from house ownership, size, type of construction, facilities such as availability of running water, electricity toilets, etc. Demographic data and other sociological survey data are also included

Relevant demographic and sociological survey data from this system can be aggregated at Kebele or Block level to give information about specific project area.

3 System Design andSoftware Specification

3.1 Semantic DataModel



The basic design is based on the above semantic model that specifies entities, attributes and their relationships.

In the following pages this design is further detailed in file specifications and data structures.

3.2 Data files within the MIS/M&E data base

Projects

- P-No.
- P-Name
- A-No. (funding)
- A-No. (planning)
- A-No. (impl.)
- P-Budget
- P-Start
- P-Completion
- P-Status (milestones)
- P-Phase

Project sectors

- S-No.
- S-Name

Projects/P.sectors

- P-No.
- S-No.

Actors

- A-No.
- A-Name
- A-Type

Locations

- Woreda-No.
- Kebele-No.
- Population
- # of households
- # of housing units
- av.size of household
- house holder sex
- ownership of HH
- employment rate
- literacy rate
- labour availability

Projects/Locations

- P-No.
- Woreda-No.
- Kebele-No.
- # of beneficiaries
- Dg.of organisation
- Dg.of participation
- Dg.of cost recovery

Infrastruct.type

- I-No.
- I-Type

Projects/P.sectors/ Infrastructure types

- P-No.
- S-No.
- I-No.
- Quantity
- Start
- Completion
- Technical suitability

Locations/P.sectors/ Infrastruct.types

- Woreda-No.
- Kebele-No.
- S-No.
- I-No.
- Quantity
- Suitability

3.3 Infrastructure types per project sector

Infrastructure types and codes common to all projects. To enhance data integrity during input these type are designed to be entered once and selection of these data to particular projects are to be made from drop down menu.

Project sectors	Infrastructure types
Excreta disposal	- VIP latrines - Dry pit latrines
Solid waste disposal	- Containers - Door to door collection - Garbage collection - Hard stands - Access roads - Culverts/bridges
Water supply	- Stand pipes
Storm water drainage	- Open ditches - Closed pipes - Culverts/bridges
Sludge disposal	- Suction - Access roads - Culverts/bridges

3.4 Code Tables (examples)

Technical Quality/suitability:

- BS below standard
- SS standard
- AS above standard

Degree of Organisation:

- AC active committees
- NC nonactive

Degree of Participation:

- H all project phases
- M mainly implement.
- L no or sporadic

Degree of Cost Recovery:

- O organised/regularly
- D on demand

3.5 Data entry and update screens specification

Data files	Project data	Location data	Project sector data	Infrastructure type data	Actor data	Code tables
Actors					X	
Projects	X					
Project sectors			X			
Locations		X				
Projects/ Locations	X					X
Projects/ P.sectors	X					
Infrastructure types				X		
Projects/ P.sectors/ Infrastructure types	X					X
Locations/ P.sectors/ Infrastructure types		X				X

3.6 Report design and specifications

3.6.1 Different views onto the data base (reports)

Data files	Project details & project group summaries	Infrastructure details per sector	Location characteristics and provision with services/ projects	Activities of donors by sector and location	Activities of planning agencies by sector and location	Activities of implementing agencies by sector and location
Actors	X		X	X	X	X
Projects	X		X	X	X	X
Project sectors	X	X	X	X	X	X
Locations	X		X	X	X	X
Projects/ Locations	X		X	X	X	X
Projects/P.sectors	X		X	X	X	X
Infrastructure types	X	X	X	X	X	X
Projects/P.sectors/ Infrastructure types	X	X	X	X	X	X
Locations/P.sectors/ Infrastructure types	X	X	X	X	X	X

3.6.2 Report design

3.6.2.1 User interface

The data base of the system could be considered as a multidimensional cube with the dimensions Actors, Locations, Projects .... Information retrieval therefore is in priciple possible in two ways:

- Projection: reducing the number of dimension to two (e.g. display all projects and actors in one location).
- Selection: Selecting an appropriate subset of data for display (e.g. display all actors that are donors and their respective projects in the excreta disposal sector).

Again there are two modes of access:

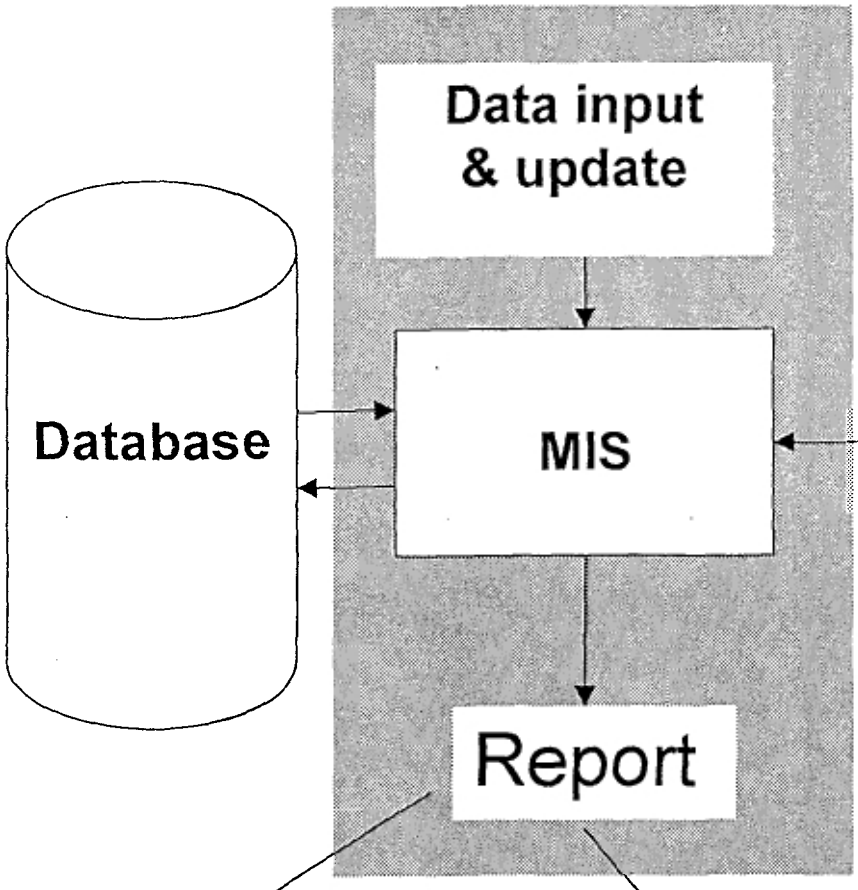
- Menu driven: pre-definded reports (as stated in the TOR).
- Parameter selection: on user's demand.

Although the menu driven approach is quite comfortable the generating of reports on user's demand by parameter selection is more

- flexible and expandable,
- relatively easy to use,
- copes with any future demand and
- needs a minimum of software maintenance.

The consultants therefore strongly recommend to implement an on-demand report generator as will be presented with the pilot system.

3.6.2.2 General overview of the system and user interface



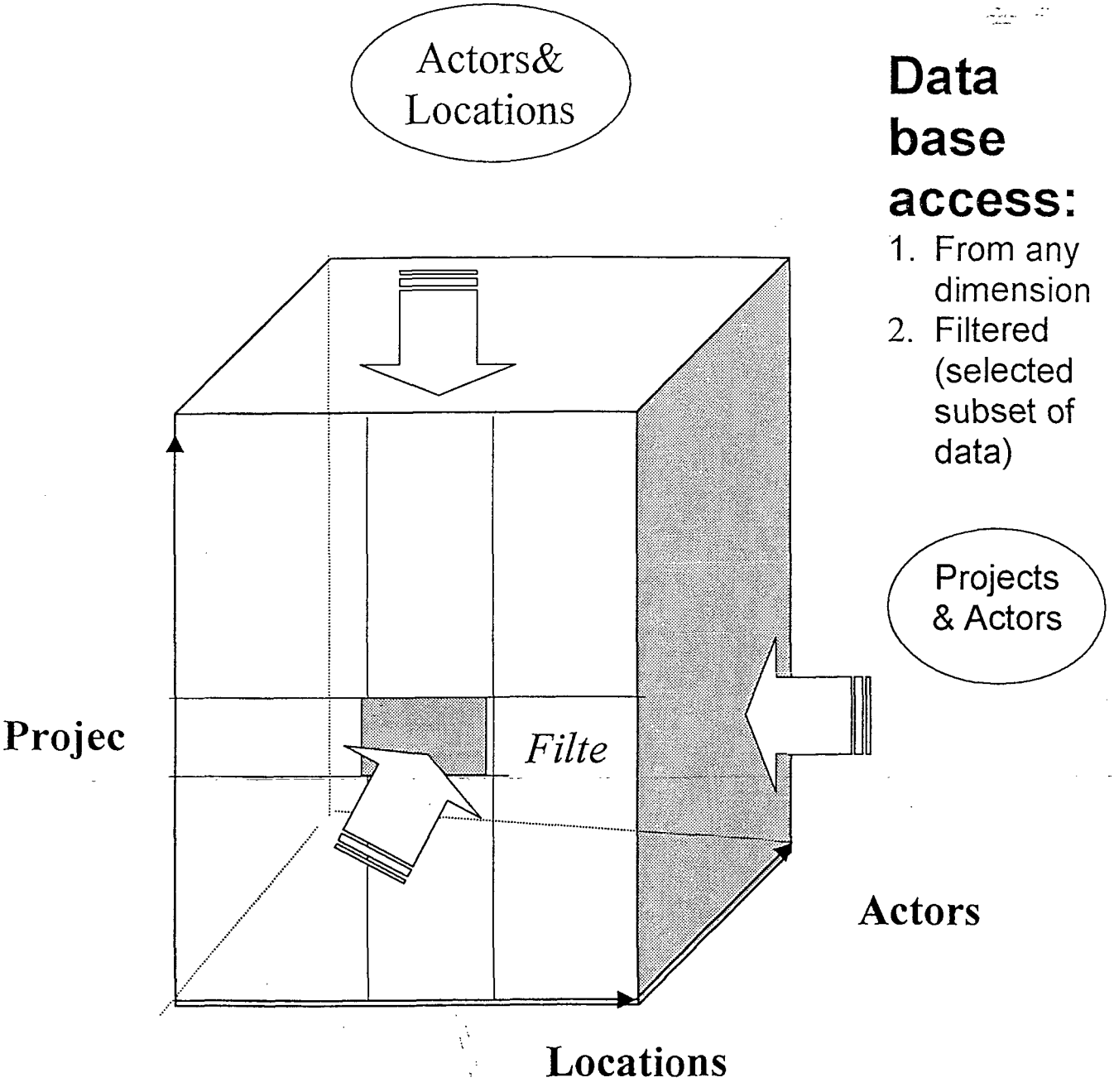
Transferable to MS-Word and Excel files

modes of access:

Pre-defined reports (menu driven)

User defined reports (parameter selection)

3.6.2.3 Data base is a multi-dimensional cube



3.6.2.4 Proposed Menu structure

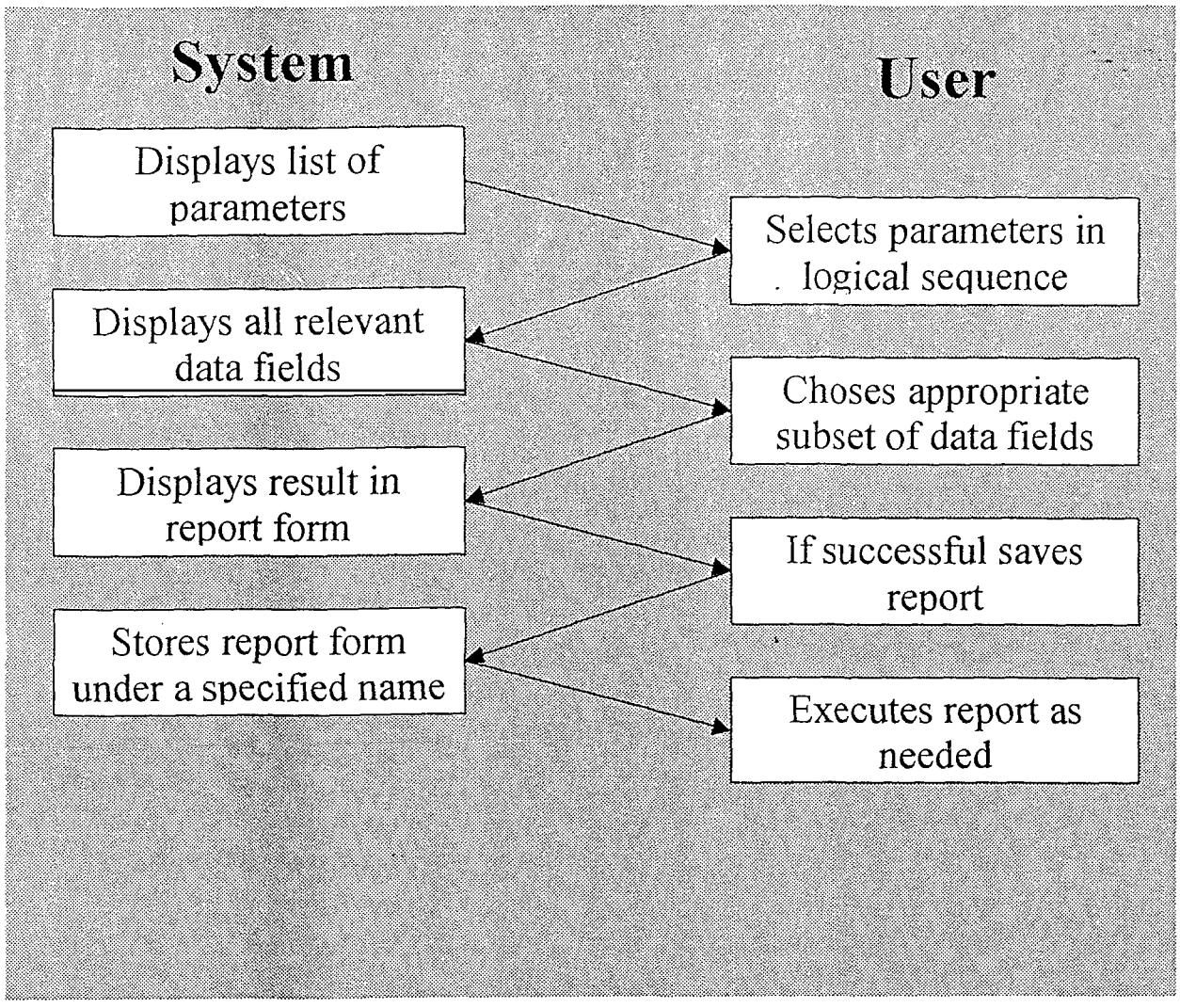
- Actors (1,all)
  - Projects by donors (1), project sectors (1,all) and locations
  - Projects by planners (1), project sectors (1,all) and locations (1,all)
  - Projects by implementers (1), project sectors (1,all) and locations (1,all)
- Projects
  - Individual projects
  - Projects by project sector (1,all) and location (1,all)
- Project sectors
  - Projects by project sector (1) and location (1,all)
- Infrastructure types (1,all)
  - Projects by sectors (1), locations (1,all) & infrastructure type
  - Locations by project sectors (1) and infrastructure type (1,all)
- Locations
  - General characteristics of individual location
  - Projects by project sectors (1,all), locations (1,all) and infrastructure type (1,all)
  - Locations by project sectors (1,all) and infrastructure type (1,all)
- Data input & update
  - Project data
  - Location data
  - Project sector data
  - Infrastructure type data
  - Actor data
  - Code tables

3.6.2.5 Report Design (example)

Activities of donors (1) by project sector (1) and location (1)

Name	Entity	Attribute	Quantity	Remarks
Name of actor	Actors	A-Name	1	
Type of actor		A-Type	1	
Project sector	Project sectors	S-Name	1	
Woreda	Locations	Woreda-No.	1	
Kebele		Kebele-No.	1,n	n = If location is only specified by Woreda-No.
Size of population		Population	1,n	
Number of households		# of households	1,n	
Project number	Projects	P-No.	M	List of projects in project sector and location
Name of project		P-Name	M	
Start of project		P-Start	M	
Project status		P-Status	M	

3.6.2.6 Proposed on-demand report generator



3.6.2.7 Selection of parameters

Entities	Options	Default option
Actors roles	- all - donors - planners - implementers	All
Actors	- all - one from list	All
Project sectors	- all - one from list	all
Infrastructure types	- all - one from list	all
Projects	- all - one from list	all
Locations: Woredas	- all - one from list	
Locations: Kebeles	- all - one from list	all

3.6.3 Poposed Data Transfer module (LIS)

- The LIS database is developed using Visual FoxPro
- Text data and descriptions are in Amharic
- The data transfer program is required to have the following modules and features
  - Data Read Module
    - Prompts for desired Woreda and Kebele
    - Reads the relevant data fields.
    - Aggregates data to Kebele level
    - Saves data in FoxPro format
  - Amharic to English Conversion Module
    - Has in-built conversion tables
    - Converts Amharic to English
    - Saves data in FoxPro format
  - FoxPro to MS Access Conversion Module
    - Converts data to MS Access format
    - Saves data in Access format
  - Report Module
    - Produces various reports

3.6.4 Proposed Data Transfer module (ESRDF's MIS)

- A small Access based routine with the following features:
  - Data Read Module
    - Reads the required data from the ESRDF file
    - Recognizes Addis Ababa based CBES related projects
    - Prompts for project period
    - Copies the relevant data fields.
  - Data Transfer Module
    - Appends data to CBES MIS/M&E
    - If the project data is new creates new project and append subsequent data
    - If the project has already been registered append new data to relevant fields

3.7 The Pilot System

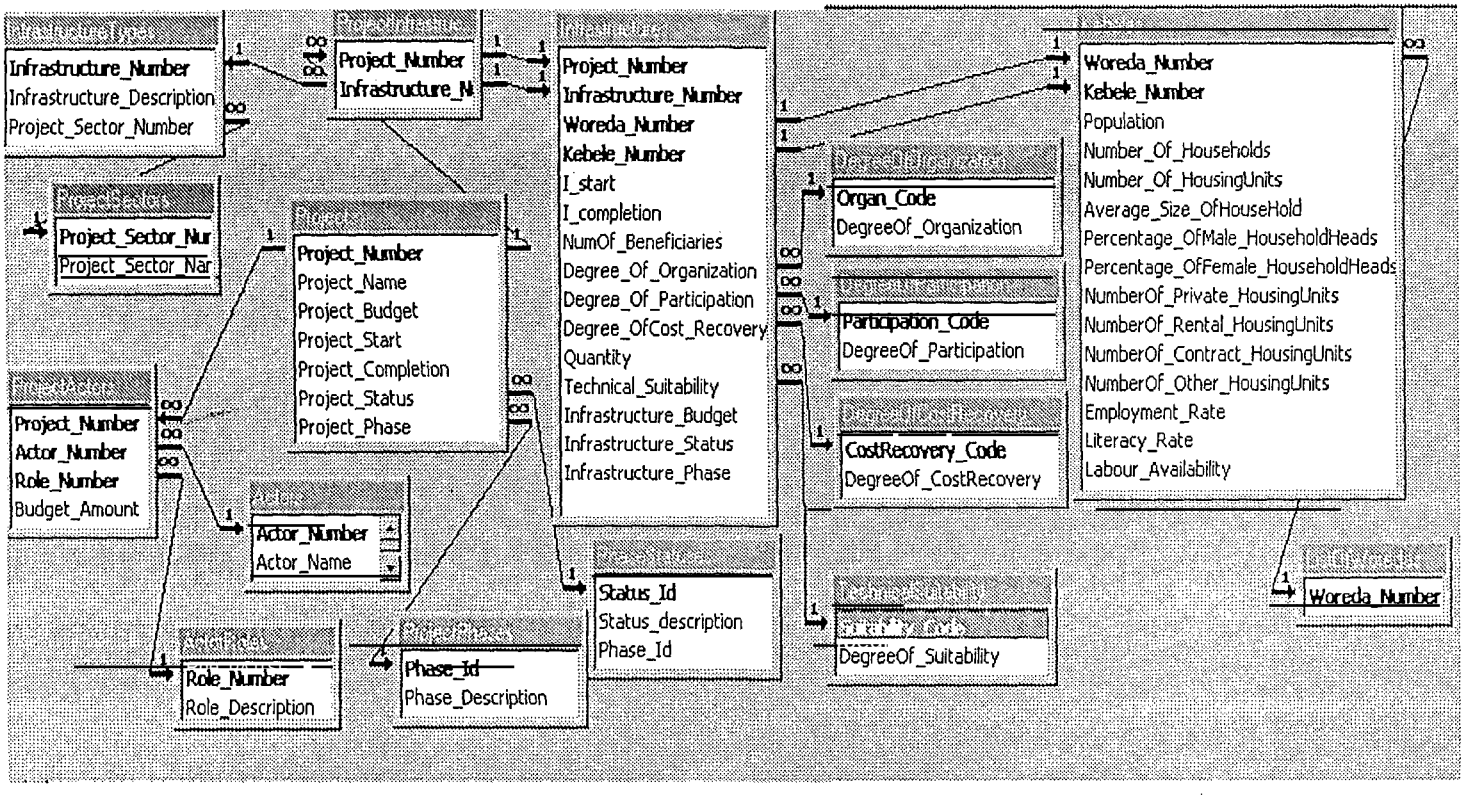
1. Objective.
   The main purpose of the pilot system is to simplify the user-designer dialogue by providing a functioning system that will serve as a base for fine tuning the needs and requirements for the final MIS/M&E.

2. Prototype overview.
   The pilot system was developed using MS-Access on a Windows 95 platform. The data requirements identified so far are included in the various tables that make up the pilot database. Accordingly it contains all the project data such as project name, project budget, the start and completion dates together with the project number, phase and status fields in one table. Other attributes of a project, such as the funding organisation, location and its particulars, type of infrastructure provided by the project etc., are contained in separate tables and linkages to these attributes is effected through ID numbers. Allocating separate tables for the various entities, objects and attributes guarantees the flexibility and adaptability of the system.

3. Input formats.
   A number of data input screens were designed and implemented. These are menu driven and user friendly. The particular format for any given set of data is accessed from the main menu.

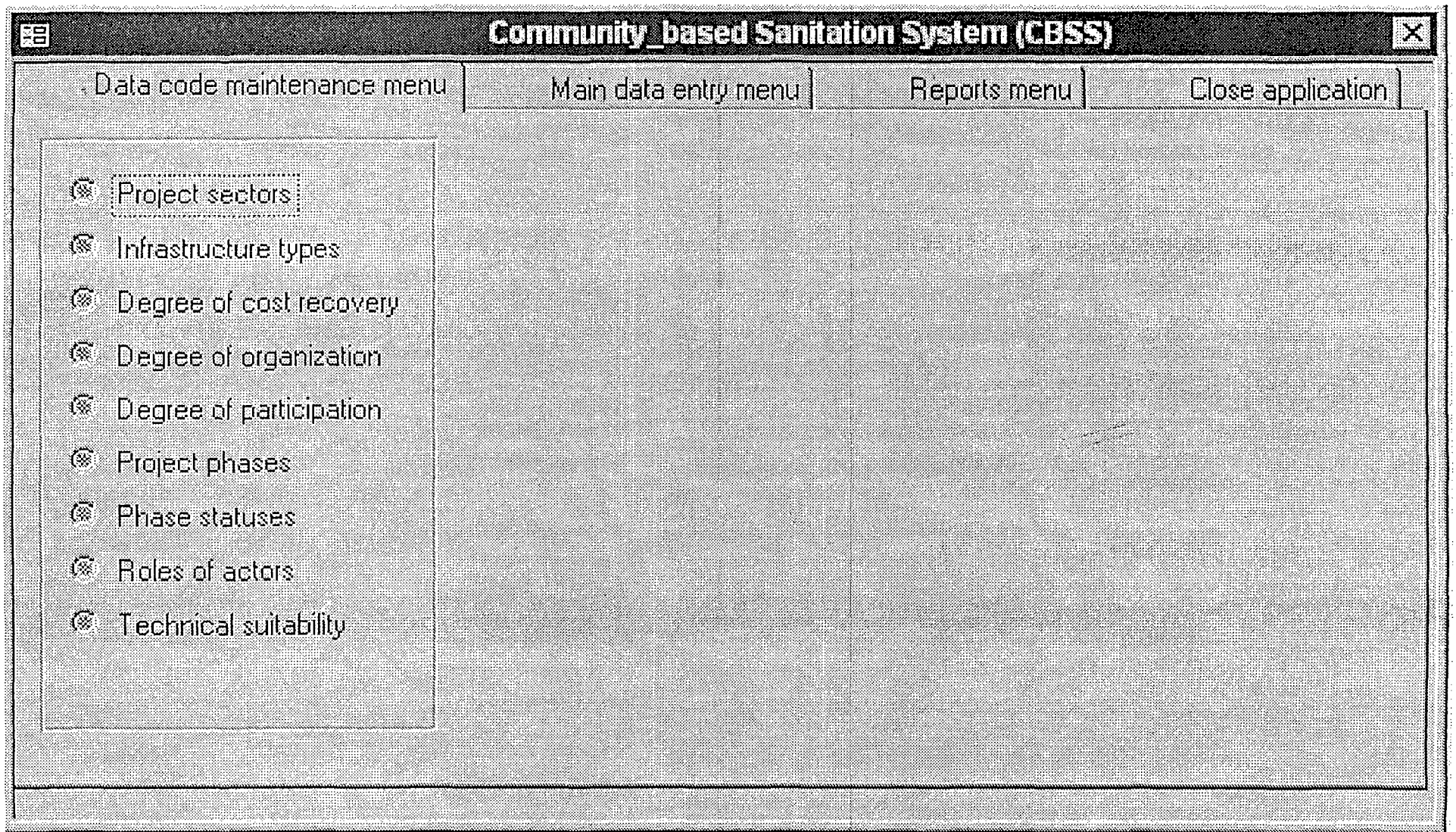
4. Reports.
   A flexible report generation method was selected for the pilot system. Some sample reports are attached. Only the demonstration of the system will give full appreciation of this method.

Community based sanitation database: sets of entities and relationships

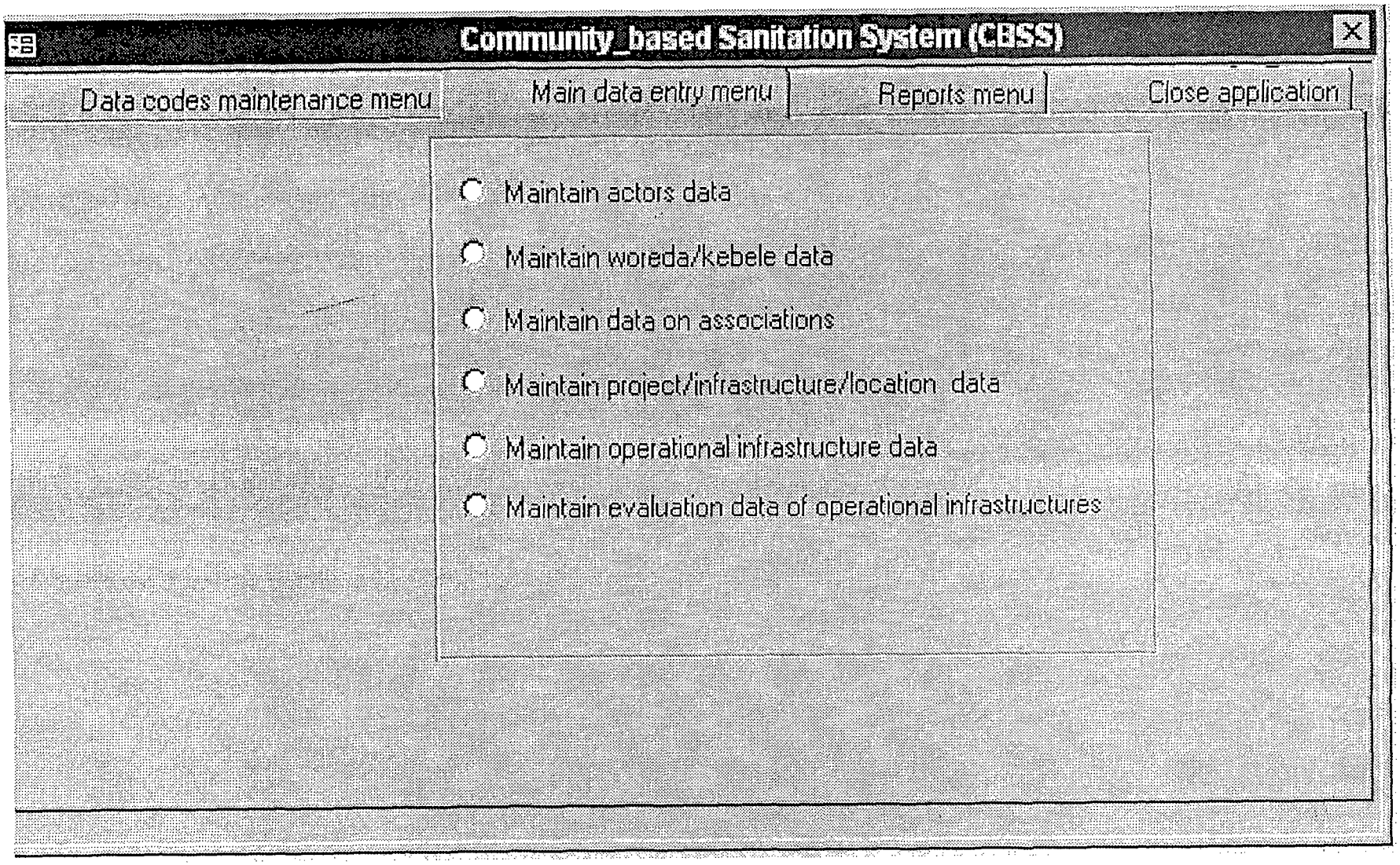


3.7.1 Input screens

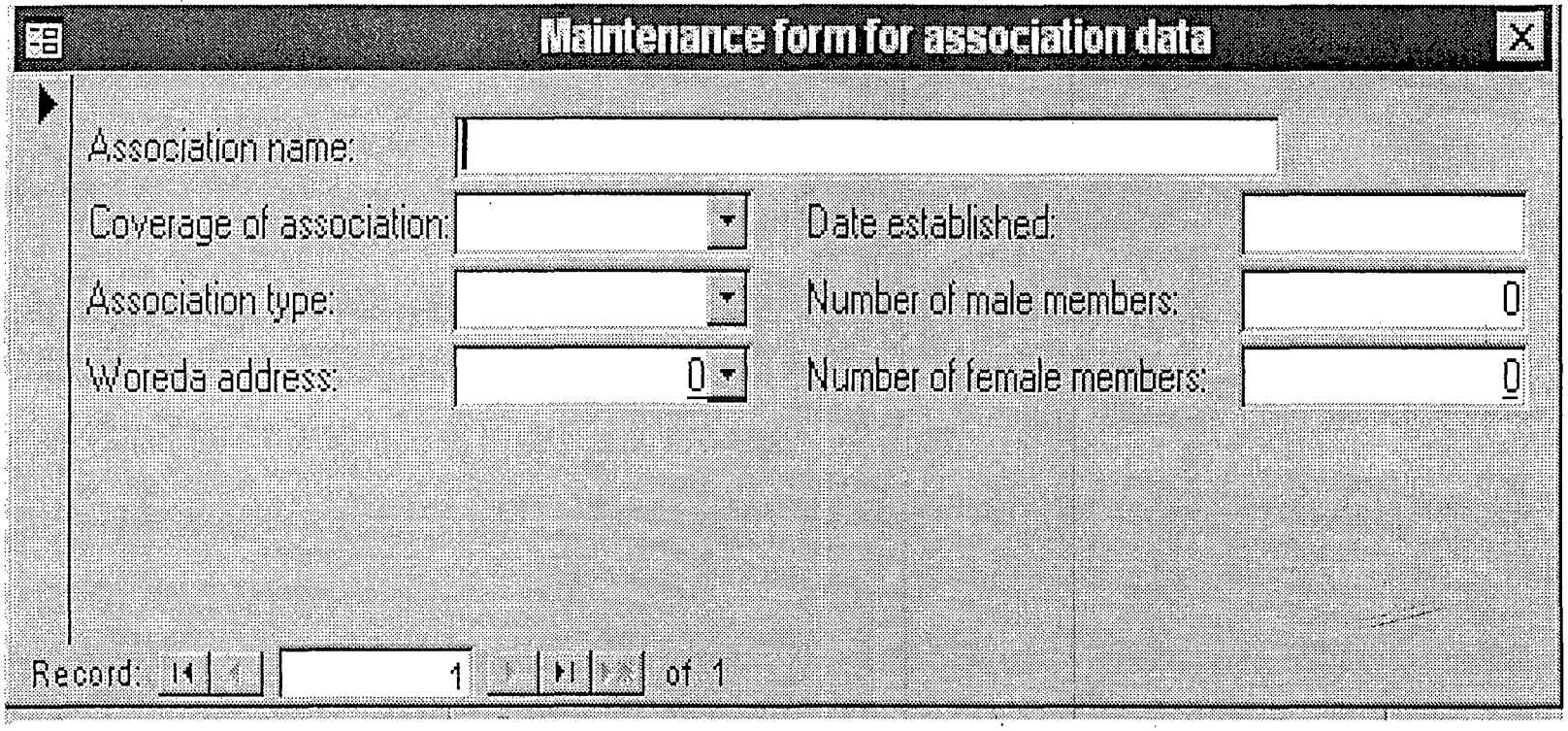
3.7.1.1 Menu for Maintaining Code Tables



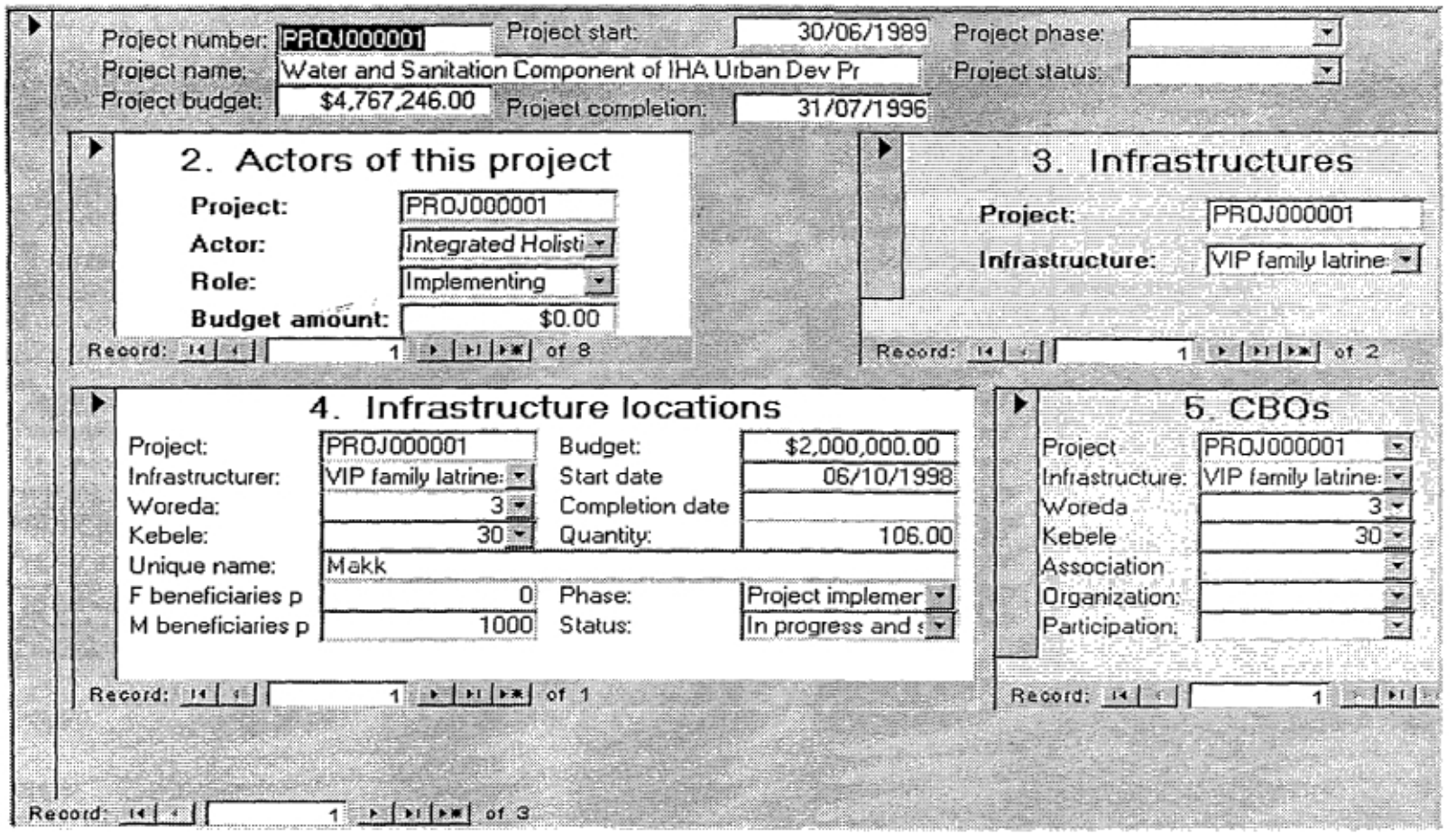
3.7.1.2 Main Data Entry Menu



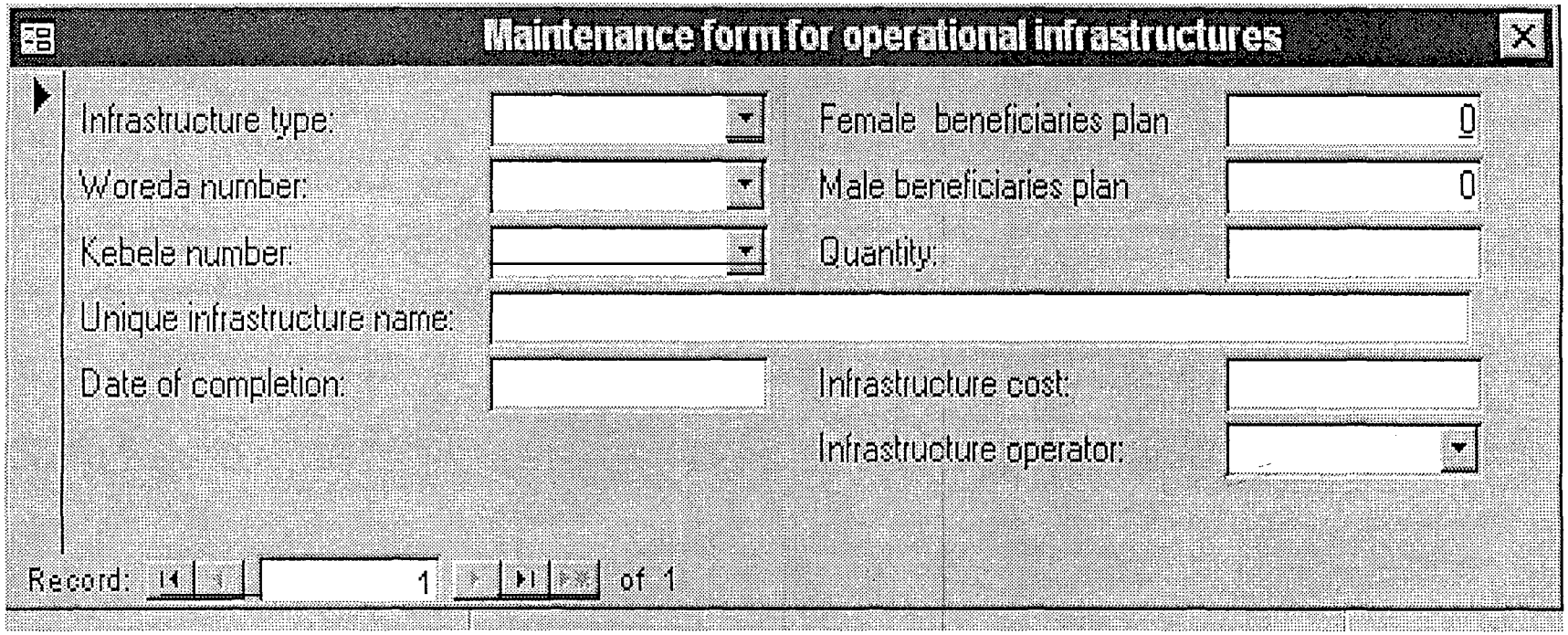
3.7.1.3 CBO Registration Menu



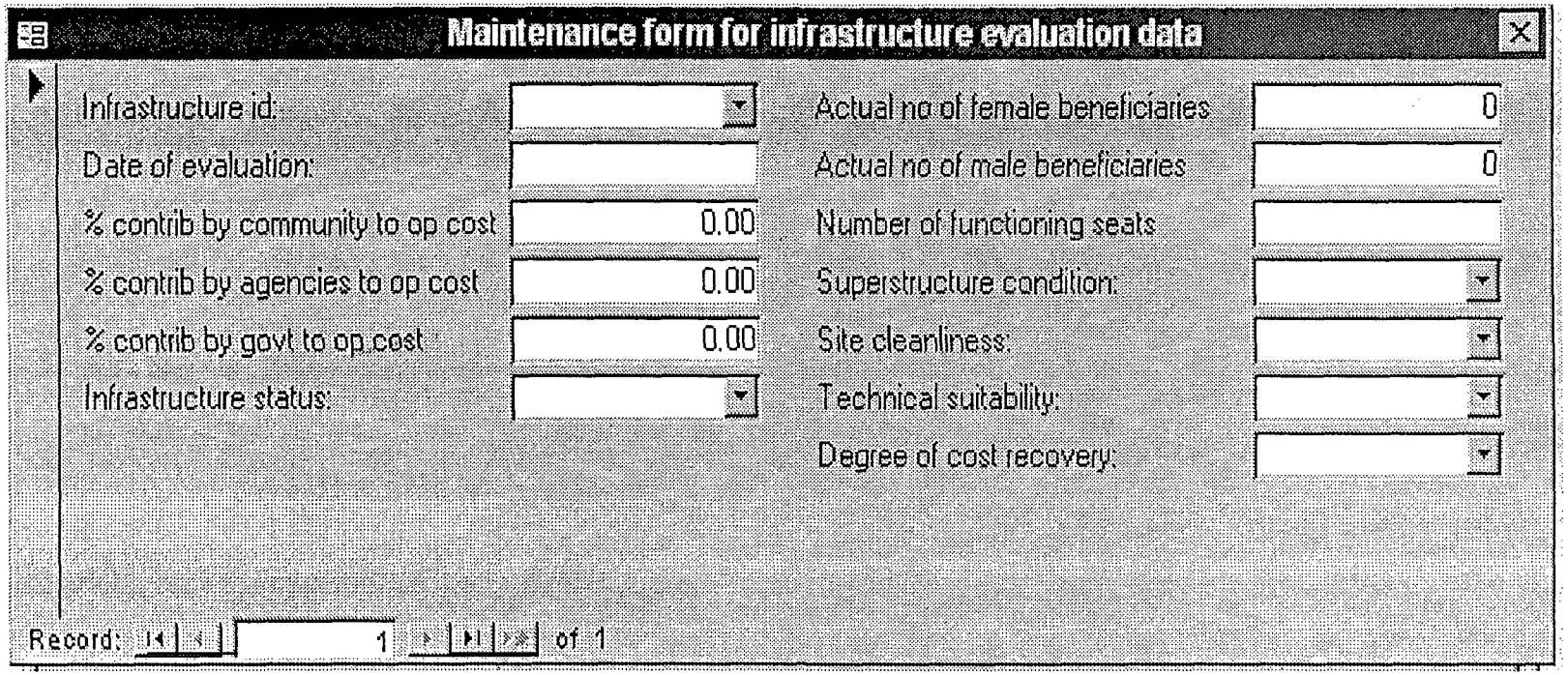
3.7.1.4 Project Data Input Menu



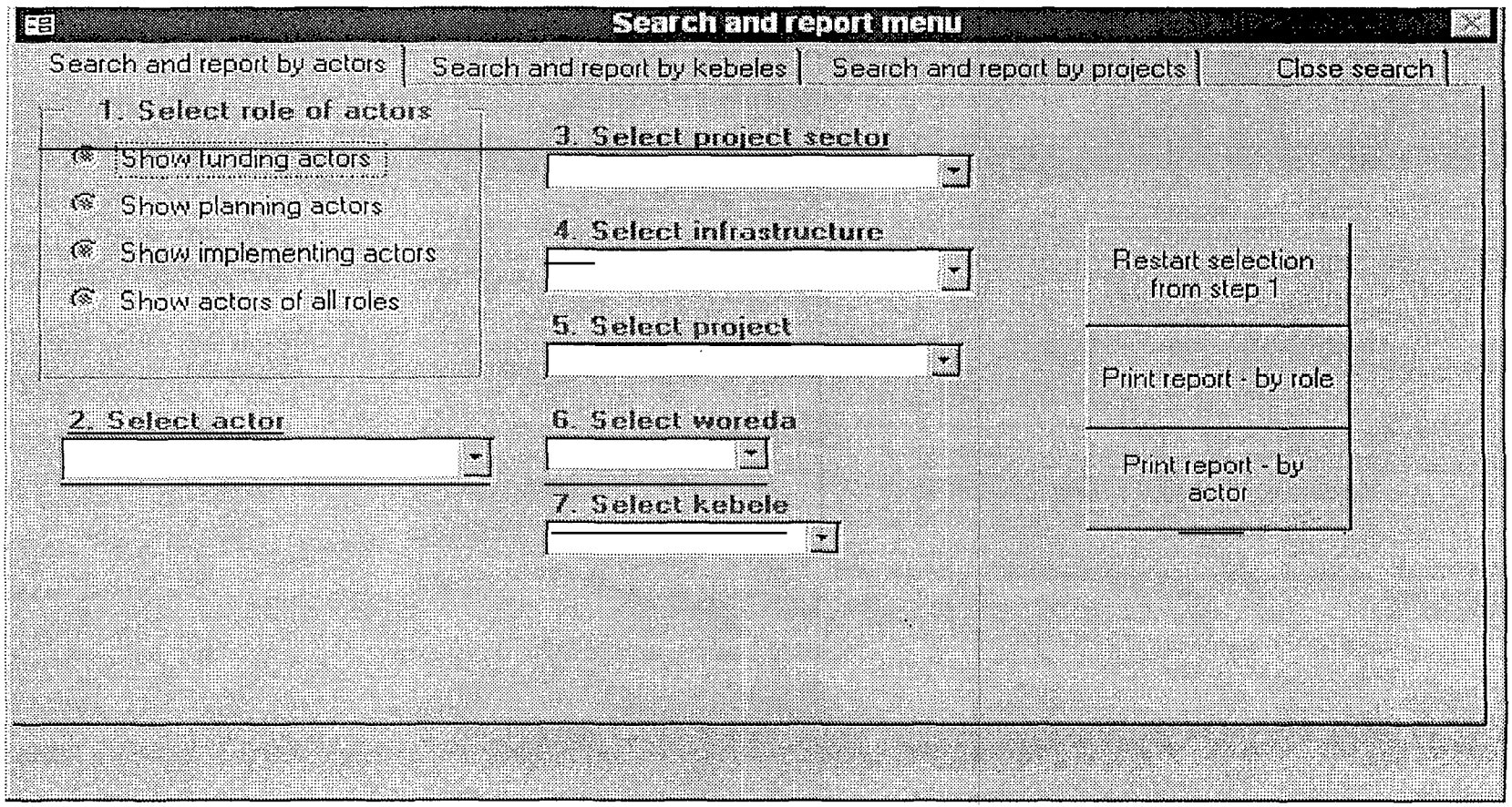
3.7.1.5 Existing Infrastructure Registration Menu



3.7.1.6 Evaluation & Monitoring Data Input Menu



3.7.1.7 Parameter Selection and Report Menu



3.7.1.8 Example: report generated by the pilot system

Projects by Actors within Roles

Funding Role Actor **British Embassy** Type of agency **NGO**

Sector **Excreta disposal**
Infrastructure **VIP latrines**
Project **Water and Sanitation Component of IHA Urban Dev Pr**
Project No. **PROJ000001**
Project budget **$4,767,246.00** Project_Start **6/30/89**

Phase	Status			
Woreda	Kebele	Population	Number of households	
Beneficiaries	Start date		Quantity	
3	**30**			**1000**
		10/6/98	**106**	

Project beneficiaries **1000**
Beneficiaries from this actor **1000**

Actor **Embassy of the USA** Type of agency: **NGO**

Sector **Excreta disposal**
Infrastructure **VIP latrines**
Project **Water and Sanitation Component of IHA Urban Dev Pr**
Project No. **PROJ000001**
Project budget **$4,767,246.00** Project_Start **6/30/89**

Phase	Status			
Woreda	Kebele	Population	Number of households	
Beneficiaries	Start date		Quantity	
3	**30**			**1000**
		10/6/98	**106**	

Project beneficiaries **1000**
Beneficiaries from this actor **1000**

3.7.1.9 Example: report generated by the pilot system

by Roles within Actors

Actor **Integrated Holistic Approach** Type of agency: **NGO**

Role **Implementing**

Sector **Excreta disposal**

Infrastructure **VIP latrines**

Project **Water and Sanitation Component of IHA Urban Dev Pr**

Project No. **PROJ000001**

Project budget **$4,767,246.00** Project_Start **6/30/89**

Phase Status

Woreda	Kebele	Population	Number of households		
Beneficiaries	Start date		Quantity		
3	**30**				**1000**
			10/6/98	**106**	

Project beneficiaries **1000**

Beneficiaries from this actor **1000**

3.8 Other recomandations

3.8.1 Data Acquisition and Integrity

3.8.1.1 Project data.

PIO should have immediate and complete access to project data from the very beginning of a new sanitary project until it's final completion. This access will only be guaranteed through a central institutional body. Two proposals are considered at present:

- The Sanitation Forum within the A.A. City Administration and
- The institutional set-up the Tropics Consultants will recommend in their final report.

With regard to the first proposal the PIO will play a co-ordinating role for all actors and projects in the sanitation field of the city. Access to relevant data will be secured if this proposal will be implemented.

3.8.1.2 Location data

In general there are two ways to obtain up-to-date location data:

- Land Information System database of Urban Development Works Bureau: The system to be developed will include program for the transfer of data from this system
- Woreda & Kebele Administration.

A regular updating procedure for location data from Woreda & Kebele Administration has to be investigated as well as the subset of data has to be selected that is manageable and relevant at the same time.

3.8.1.3 Data integrity

It will be of vital importance for the sustainability of the MIS/M&E that the responsibility for data input, update and deletion will be centralised. It is, therefore, strongly recommended that a MIS/M&E Administrator will be selected and trained within PIO for this duty. His major responsibility will be to secure the integrity and consistency of the data base (see next chapter).

Build-in features of the software could easily manage the security of the data.

3.8.1.4 Organisational aspects and responsibilities

3.8.1.4.1. Within PIO.

As mentioned in the previous chapter, PIO should establish a new service department: MIS/M&E System Administration. One to two system administrators that directly report to the GM of the PIO will staff this department.

The overall responsibility of the system administrators will be the proper operation and maintenance of

- MIS/M&E hardware (server, printer etc.)
- NetWare
- Software and
- Data base.

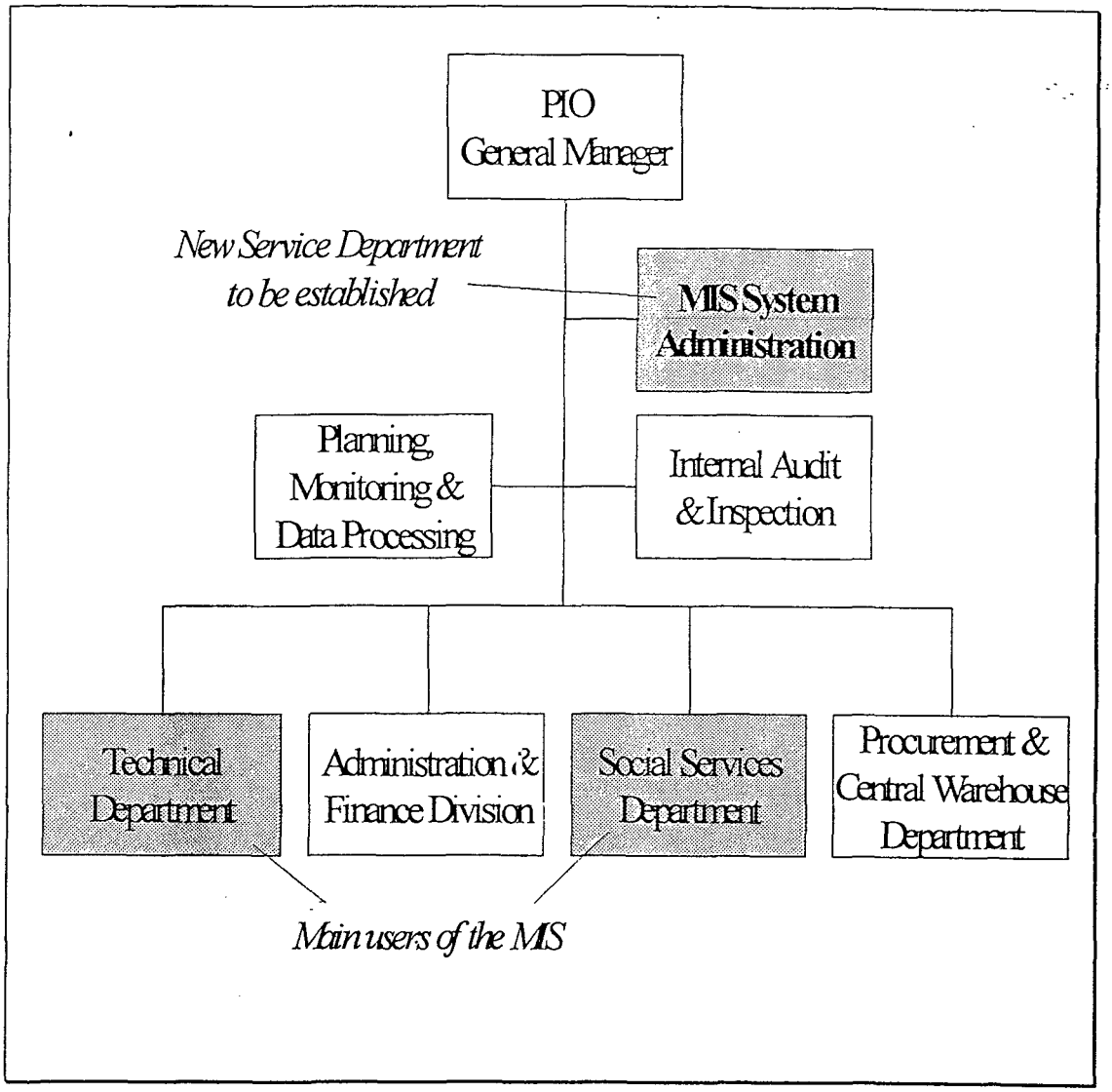
In addition, the system administrators' obligation would be to

- Promote the MIS/M&E to external users,
- Produce reports on request of external users,
- Train new users,
- Advise and support users,
- Enhance and improve the MIS/M&E according to any future demand.

3.8.1.4.2. Community level.

It has not yet been clarified how a close interaction between the co-ordinating body (PIO) and the local administration should be organised. It is, however, recommended that the local administration should not only provide the location data needed for an effective use of the MIS/M&E but that they should also have access to the information system. Printed reports that highlight the sanitation situation in A.A. and its administrative areas could be distributed for this purpose.

3.8.1.4.3. New organisational structure of PIO



4 Implmentation Plan and Cost Estimate

4.1 MIS/M&E Implementation Plan

It is proposed that the implementation of the MIS/M&E consists of altogether three phases:

- Phase 1: Implementation of a LAN based system,
- Phase 2: Upgrading network to WAN through modem connections,
- Phase 3: Expansion and improvement according to identified needs.

For the time being the duration of the decision making and mobilisation of funds process for the proposed system is not known. Six months could be a good estimate. As soon as the necessary funds will be available and the decision has been made to implement the MIS/M&E, Phase 1 would approximately last six months. Therefore, the MIS/M&E could be operational as of end of 1999.

A review and evaluation of the achievements of the project is recommend before the end of the first year of operation. An independent expert could be assigned to this task.

It is suggested that the commencement of Phase 2 should be delayed for at least a year so that in the meantime PIO could achieve comprehensive experience with the MIS/M&E in operation. As soon as the operation of the MIS/M&E has reached a satisfying level Phase 2 could be implemented. The duration of Phase 2 is estimated to be three additional months.

The total cost of the MIS/M&E of Phase 1 has been estimated to 565,000 Birr.

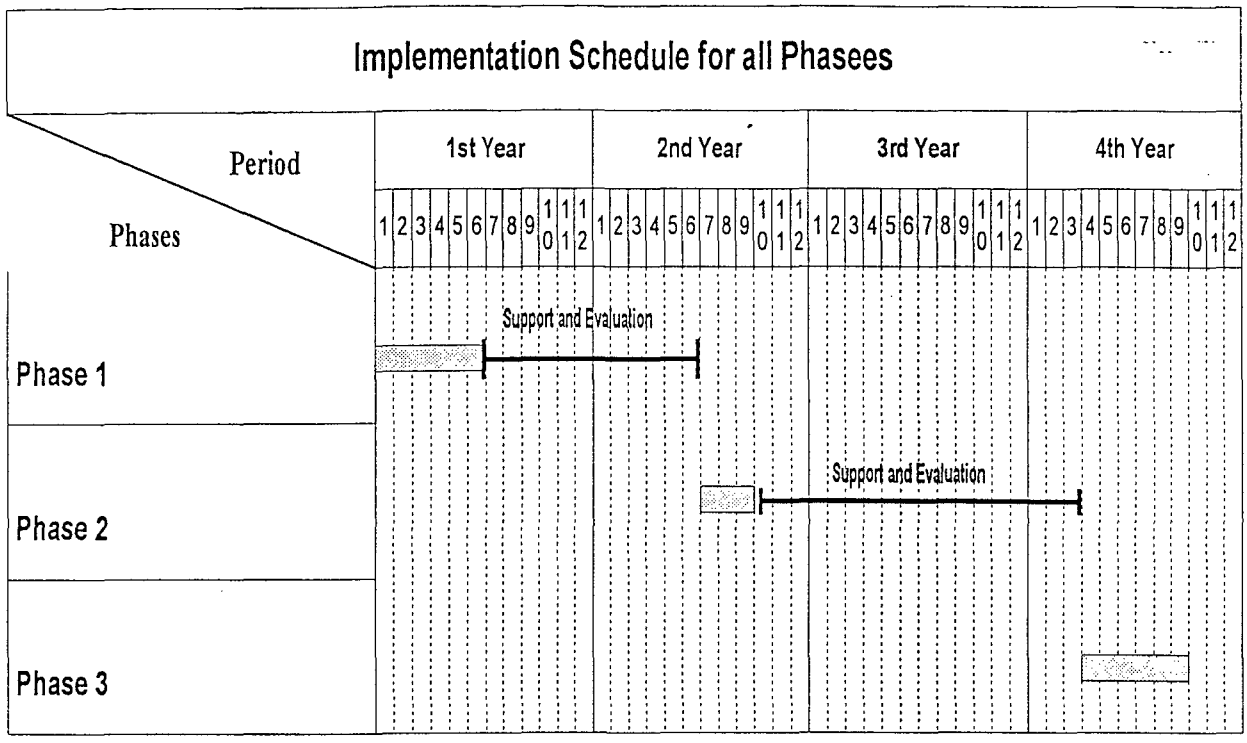
4.2 MIS/M&E infrastructure proposal (1)

System Objective:	To capture relevant data and provide such information to the various actors engaged in CBES related activities in order : ➢ to overcome the *observed limitations of CBES projects;* ➢ to enable adherence to the stated *principles for integrated sanitation control;* ➢ to address the *special issues of particular interest;*
Implementation Strategy:	The system implementation process will encompass three phases.
First Phase	
Objective:	To establish simple, sustainable and scalable MIS/M&E that, in line with the system objective stated above, will address the most common information needs of all CBES actors; and with the following features:
Advantage:	- Simple to learn, operate and maintain; - Requires small volume of initial data input to become operational;
Hardware requirements:	Local Area Network consisting of one server supporting five client PCs and one network printer.
Software requirements:	WindowsNT five user and custom tailored, MS-Access based application software
Training requirements:	Two network administrators and up to 10 users;

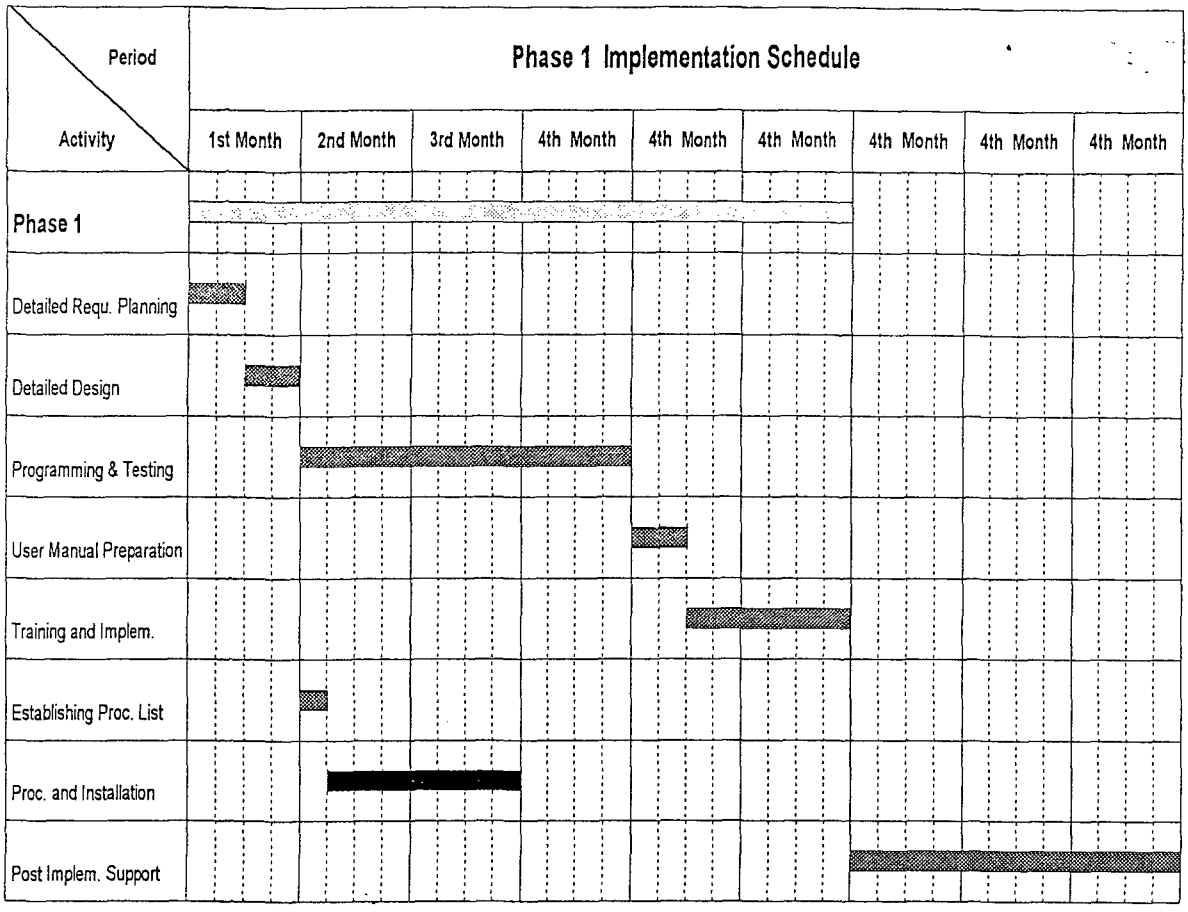
4.3 MIS/M&E infrastructure proposal (2)

Second Phase	
Objective:	To upgrade the Network to WAN through modem connections in order to: ➢ give direct access to others that are frequent system users; ➢ create linkages with other systems (LIS, ESRDF's MIS/M&E)
Advantage:	➢ Efficiency and ease of use ➢ Widening of scope of information and mutual data update benefits
Hardware requirements:	Modems.
Software requirements:	None.
Third Phase	
Objective:	To evaluate the adequacy of the system in light of : ➢ its data content ➢ relevance of its output ➢ its hardware and software performance ➢ existence of other competing and/or complementing systems elsewhere
Measure to be taken:	Depends on the outcome of the evaluation.

4.4 Implementation Schedule

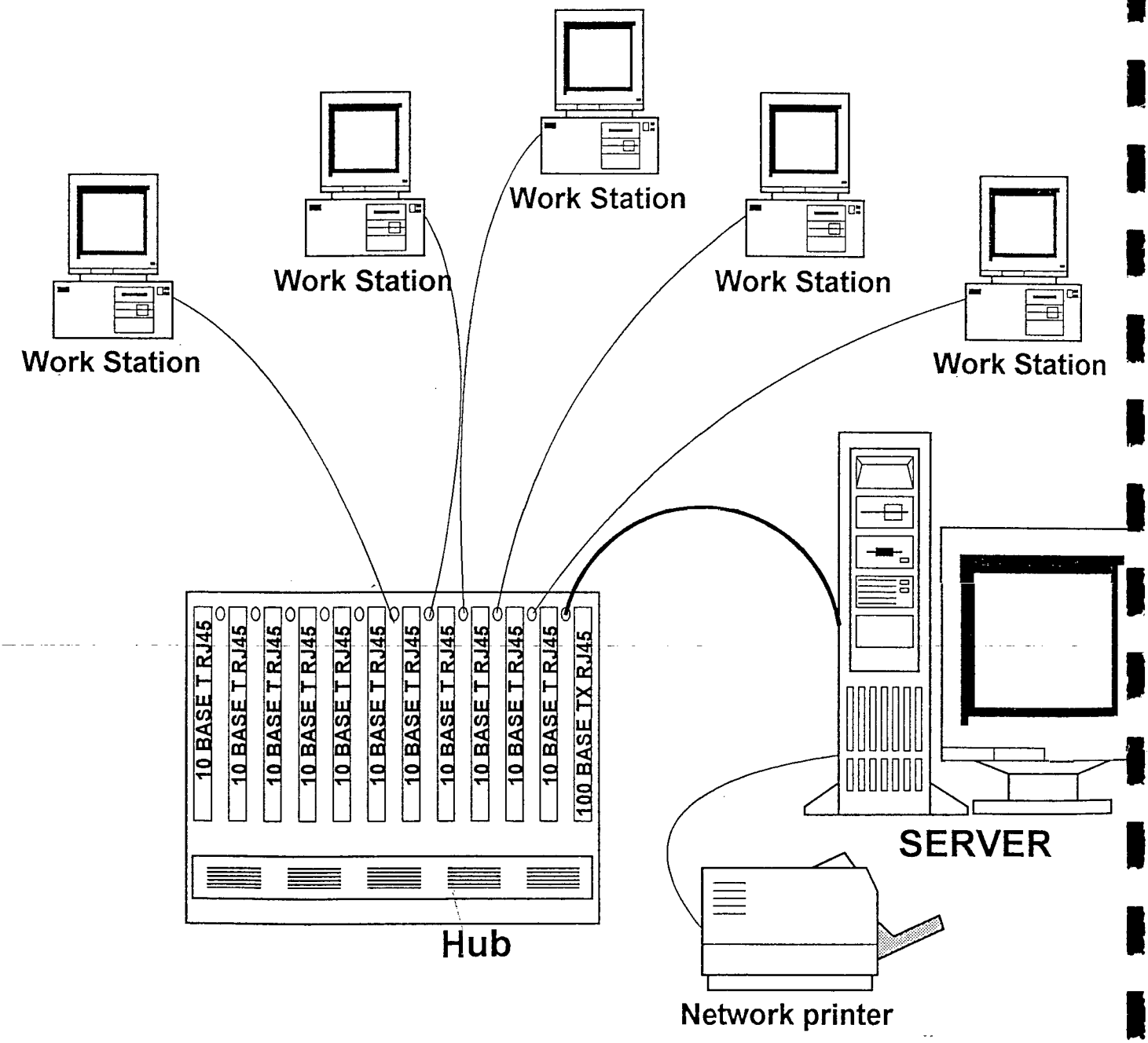


Phase 1: Implementation Schedule for LAN based System

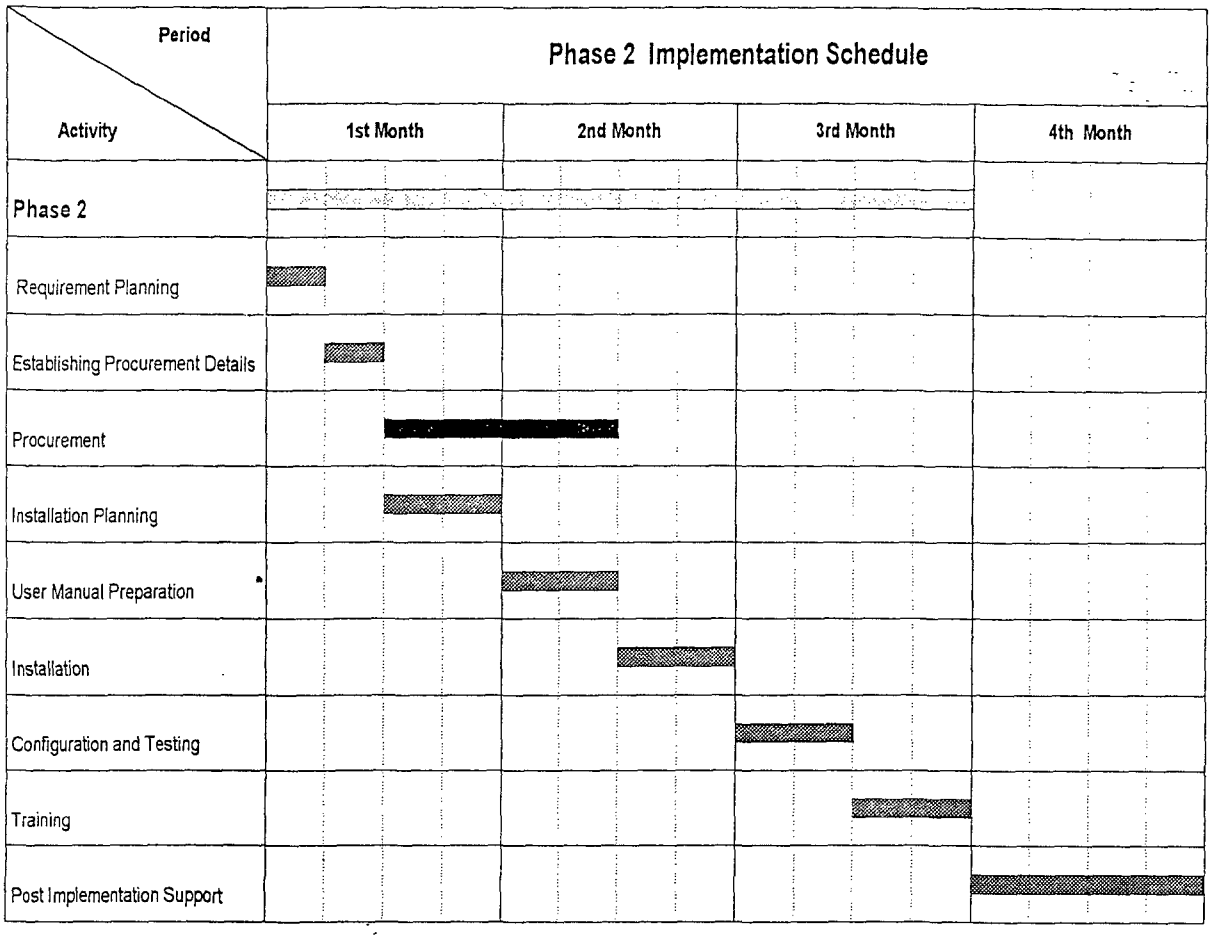


Activity	Responsibility	Duration in weeks
Review project reports & specify add. requirements	PIO	2
Alter systems design according to specified needs	consultant	1
Establish procurement details (server, LAN)	consultant	-
Buy and install hardware, software + netware	PIO	12
Develop Access based software Test software	consultant PIO&consultant	12
Select system administrator	PIO	-
Prepare user manual, training&promoting material	PIO& consultant	4
Train potential users and system administrator	consultant	2
Select, transfer and input available data	PIO	ongoing
Inform external users about access opportunities	PIO	ongoing
Organise procedure for frequent data base updates	PIO	4

4.5 First Phase Network Configuration



Phase 2: Upgrade network to WAN through modem connections



Activity	Responsibility	Duration in weeks
Review LIS & ESRDF system and agree with system managers on transfer method	consultant	2
Establish list of major users that will run their own system	consultant	1
Establish procurement details (modems)	consultant	1
Buy and install hardware	PIO	6
Configure system	consultant	1
Test system	PIO, LIS etc.	1
Prepare user manual	consultant	1
Train users	consultant	1

4.6 Required system specification and cost estimate (1)

Item	Description	Qty.	Estimated Cost (Birr)
Server	• 350 MHz Pentium II Dual processor with 512K cache per processor • Memory 128 MB ECC SDRAM, 60ns • Integrated dual wide ultra SCSI Controller • Hard drive: 2 x 4.3 GB wide ultra SCSI • 4/8 GB internal Tape Drive • 24x CD-ROM drive • 1.44 MB, 3.5" floppy drive • Video Controller : SVGA, 512 KB VRAM • 15" SVGA colour monitor • US Keyboard, Windows 95 compatible • Microsoft mouse • 220V, 50 Hz Power supply • Network Card: Ethernet 100 Base TX NIC RJ45 port	1	50,000.00
Network Printer	HP LaserJet 6p, 8 ppm, standard configuration, parallel printer cable	1	9,000.00

4.7 Required system specification and cost estimate (2)

Network	Ethernet switching hub: • 11x10 BASE T RJ 45 ports • 1x100 BASE TX RJ45 port • RMON II at least 7 levels	1	20,000.00
	10 BASE T Ethernet cards with RJ45 port	5	8,000.00
	RJ45 Connectors	16	
	Category 5 UTP cable	500 meter	
Operating System	Windows NT	5 user	5,000.00
Data Base System	MS Access	1	5,000.00
Application Software	• MS Access based • Separate application from data providing server based and shareable data • With data import/export facility to and from other databases • Backup and fall back routine facilities		200,000.00
Data transfer Software (LIS)	• As per the specification outlined above		200,000.00
Total Software and Hardware Cost for Phase 1			**497,000.00**

4.8 Training Requirement

Type of Trainees	Type of Training	Duration (weeks)	Cost (Birr)
System Administrators (at least 2)	Windows NT Administration ▪ Setting up users account ▪ Setting up group account ▪ Administrating user and group accounts ▪ Securing network resources with shared folder permission ▪ Securing network resources with NTFS permissions ▪ Setting up a network printer ▪ Administering network printer ▪ Auditing resources and events ▪ Monitoring network resources ▪ Backing up and restoring data	4	6,000.00
	Using the MIS/M&E Using the data transfer program	2	1,000.00
User training (up to 15)	Using Windows NT Using the MIS/M&E Using the data transfer program	4	10,000.00
Total Training Cost for Phase 1			**17,000.00**

4.9 Estimated Implementation Cost for all three Phases

▪ **Phase 1**		**565,000 Birr**
MIS/M&E development and installation	500,000 Birr	
Training of PIO staff	20,000 Birr	
Three months Consultant support (spread over six months)	45,000 Birr	
▪ **Phase 2**		**180,000 Birr**
▪ **Phase 3**		**250,000 Birr**
Total amount		**995,000 Birr**

5 Annex - Reviewed materials and interviews held

5.6 Reviewed materials

1. A Project Proposal to establish a Database & Information Network on the Issue of Sanitation within the PIO.
2. Environmental Sanitation Case Study in Addis Ababa, Final Report.
   - Volume I: Main Report
   - Volume II: Case Studies
   - Volume III: Project Cards and Maps of CBES Projects by Woredas
3. A Decentralised and Integrated Sanitation Risk Control System in A.A., Concept Paper – Revised Draft.
4. Study on Institutional Arrangements and Funding Mechanisms.
   - TOR
   - Progress Report
5. Design and Installation of a Management Information System, ESRDF.
   - User Requirements
   - Specification
   - User Manual
6. Management Information Systems in Technical Cooperation, GTZ.

5.7 Interviews held

Institution	Name	Date
Health Bureau	Ato Mehari Bekele	29.10.
Project Implementation Office	Ato Aschalew Aberra	29.10.
Urban Development Support Office		29.10.
Environmental Development Project Office	Ato Getahun Terrefe	
	Dr. Mesfin Banteayehu	30.10.
Ethiopian Social & Rehabilitation Fund		
- Regional Office	Ato Kahsay Berke	
Central Office	Ato Alemayhu SemuNigus	
	Ato Tessema Geda	30.10./3.11.
A.A. Water & Sewerage Authority	Ato Abebe Belete	30.10.
CARE Ethiopia	Ato Walelign	2.11.
Tropics Consultants	Ato Tekalign Tsige	3.11.
Urban Development Works Bureau	Ato Belete Bekele	4.11.
UNICEF	Mr. Birendra Shrestha	4.11.
A.A. Road Authority	Ato Biniam	4.11.
Environmental Protection Bureau	Ato Mezid Said	4.11.
Foreign Relations&Deve. Cooperation Bureau	Ato Admitachew Sebhat	10.11.