

**Information Technology Master Plan Program
For the Ministry of Water & Irrigation – Jordan**

**Technical Working Group
Sector Wide “Geographical Information System”**

Scope of Work

June 2006

Version 1.1 DRAFT



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Introduction

Geographical/spatial Information is essential to the work of the different agencies comprising the Water Sector. In the full cycle of water exploitation, from the planning and management of water resources, to the extraction, transportation, storage, and purification of raw water, to the management and delivery of consumable water, and to the collection, transportation, treatment, and recycling of wastewater, there is an extensive need for reliable geographical information, supported with advanced spatially-based analysis functions, and seamlessly integrated with other types of information.

The water sector identified the potential benefits of Geographical Information Systems (GIS) over a decade ago. Over the years, many project-based and departmental GIS systems have developed all across the Sector. These systems varied in size, purpose, and achieved success and productivity, but all were limited to the needs, capacities, and perceptions of the concerned developing entities. This resulted in a large number of scattered and uncoordinated GIS arrangements spread all over the Sector. In WAJ, for example, independent GIS entities exist in the PMU, LEMA Company, NGWA, Aqaba Water Company, and several departments and directorates in WAJ-Central. In MWI, on the other hand, GIS is utilized as a tool by several end-users with inadequate collaboration and coordination.

The problems, deficiencies, and lost opportunities resulting from the situation described above have been widely recognized by the GIS community in the Sector, and have been discussed and described in several documents and venues. In addition, several initiatives have been taken to alleviate such problem by promoting the concepts of common standards, shared policies, and collaboration among GIS users but none have yet succeeded unequivocally.

The IT Master Plan has seen the need to establish a GIS Working Group, with the following main objectives:

- To review, consolidate, rejuvenate and build on previous initiatives in this regard
- To integrate GIS with the overall IT Master Plan and the findings of the eight Working Groups, especially where integration of GIS with other information systems is required (e.g., Asset and Maintenance Management, Customer Information and Billing Systems, Lands Management etc..)
- To develop a GIS road map for the Water Sector for establishing a Sector-wide GIS clearinghouse that meets the needs of the widest spectrum of GIS users in the Sector, whether in technical planning functions or in operations and maintenance

The Working Group shall consist of six people from MWI, WAJ (including its operating sub-entities) and JVA. This group will be headed by EE from the SC and KK from the IT Master Plan Project.

Common Objectives

This Working Group is formed to work under a continuation of the IT Master Plan project, funded by USAID, but yet to be defined and contracted. Following the goals of that original project, the objectives of this TOR are ultimately to:

- enable significant performance improvement across the Jordanian water and wastewater sector
- improve policy-making
- support effective sector regulation

Specific Working Group Objectives

This Group has to work with the GIS community in MWI, WAJ, JVA, PMU, LEMA, NGWA and/or AWC to understand their current GIS activities and existing resources as well as

future needs.

The group also needs to be aware of the developments introduced by National GIS Strategy, and ensure that the Sector GIS road map is in agreement with this Strategy.

Accordingly, the Group needs to work on achieving the following specific objectives:

- I. Review, build on, and consolidate the outcomes of previous activities in this regard, which include reports issued by the PMU GIS Department, the documentation of the April 2005 workshop, the finding of the four GIS task force groups, and the latest GIS Needs Assessment Report that was conducted by the external Consultant under the support of GTZ.
- II. Assimilate the recommendations of the IT Master Plan and identify areas of integration/interaction between GIS and other information systems (including AM-MM, CIS/Billing, Lands, LIMS).
- III. Identify and review, through literature review and other research current best practices in GIS utilization in water utilities and water planning authorities, and determine if and how these best practices could be applied to the Jordanian water sector.
- IV. Develop a detailed GIS road map for the Jordan water sector, that should result finally in both a sector-wide GIS clearinghouse and a clear Vision for a fully-GIS enabled and leveraged water sector, by addressing the following aspects:
 - a. Identify existing and potential users of the envisaged GIS Clearinghouse
 - b. Define all 'framework' GIS data sets necessary for the Clearinghouse, including assessment of their current availability, status, and source (both internal and external), based on the recent inventory of existing GIS data sets
 - c. Define GIS standards to be implemented (data models, data dictionaries, metadata, coordinate systems, application integration standards and GIS middleware tools, ...), including assessment of their current implementation status as appropriate
 - d. Propose an organizational structure for a unified GIS 'overseeing' entity (including how it should relate to the envisaged unified IT Org as well as to decentralized entities such as LEMA and NGWA), with a clear mandate and well-defined list of responsibilities
 - e. Identify areas where expansion of GIS implementation is needed
 - f. Specify the technical requirements for building the Clearinghouse including software, hardware, networking, internet/intranet, ...etc
 - g. Develop a GIS information policy plan that would govern the propagation of GIS information both within the Sector and with external agencies

Tasks and Approach

To be fully defined once full agreement on the objectives above is reached – however the tasks required are likely to include some or all of the following:

- Review of documentation on existing GIS initiatives and future plans by all entities involved
- Interviews with sector leaders and thinkers involved in developing or using GIS the outputs of current GIS initiatives
- Inventorying of existing GIS initiatives, equipment, standards etc. where data is not already available
- Secondary research into GIS best practices as implemented to support both planning and operations in water utilities and planning and oversight bodies worldwide

- Identification of “Jordanization” priorities or needs that might cause these best practice standards to need to be adapted
- Development of a business case that captures and / or estimates both the tangible and intangible benefits that could be realized by effectively leveraging GIS in the sector, and a plan for how this could be used to direct and prioritize GIS budget allocations and donor support in the sector
- Synthesis of the above into an action plan, budget and timeline for implementing both the GIS Clearinghouse and the Vision for a fully GIS-enabled and leveraged water sector

Deliverables

The group should be able to provide the following deliverables:

1. An inventory of existing GIS implementations and resources in the Sector (human, IT and data resources)
2. GIS information needs and requirements: individual entities, the sector a whole, and the National GIS Strategy
3. Roadmap to implementation for both the GIS Clearinghouse and the Vision for a fully-GIS enabled and leveraged water sector
4. Final Report and Presentation

Time Frame

To be determined, but not less than six months (it is important to time bound the activities of the Group, and to ensure their adequate release from normal duties to complete this TOR)

Communication and Meetings

To be determined

Thinking Lines

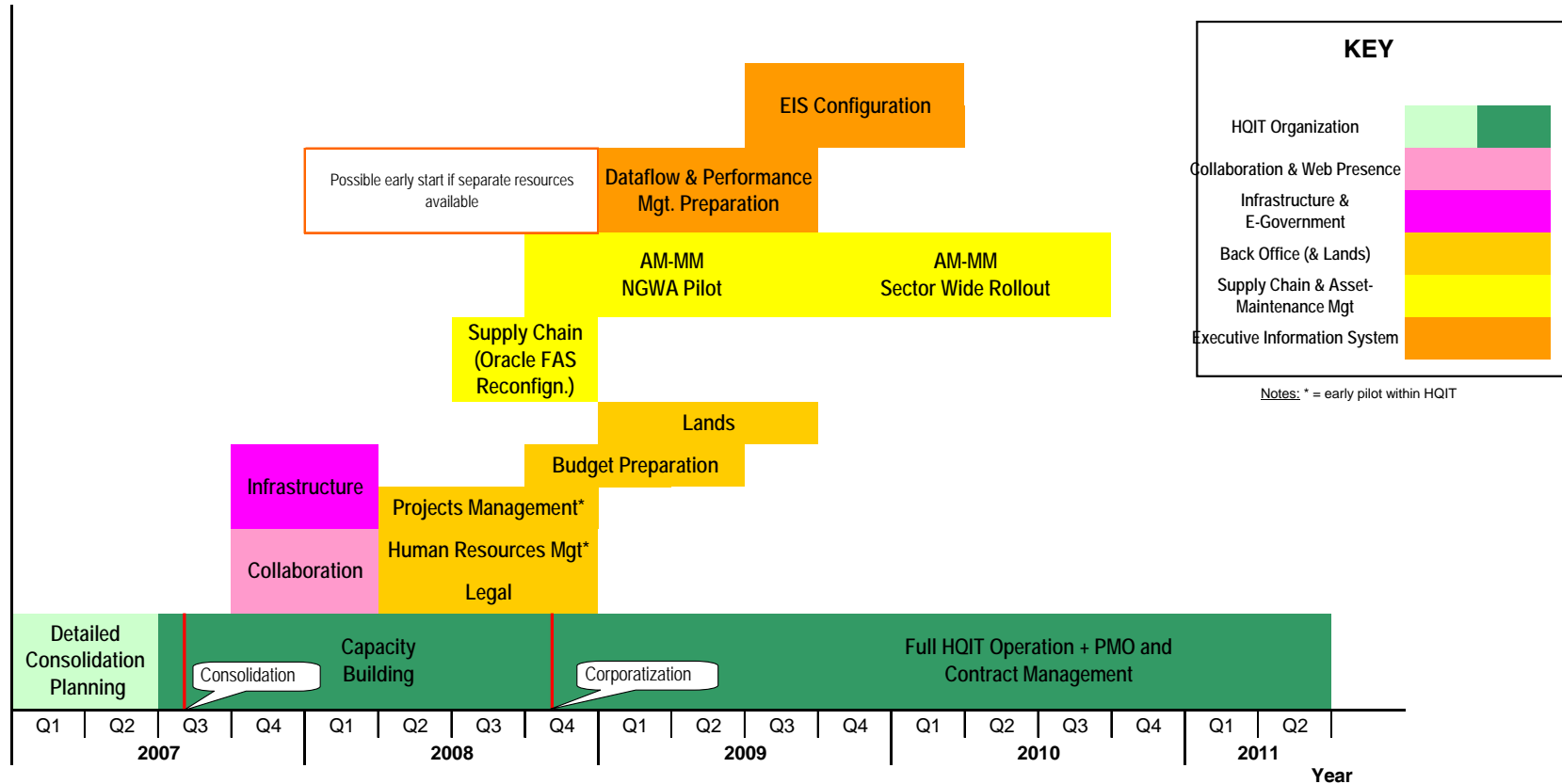
Below is a list of questions that may help in this exercise, they are provided as guideline and the group need to add to or enhance.

- What are the top issues facing the GIS community in the Sector today due to lack of a holistic approach in implementing GIS?
- What aspects in implementing GIS should be handled by the envisaged unified IT Org and what should be the responsibility of the unified GIS ‘overseeing’ entity?
- Understand the interdependency with external agencies concerning GIS data and services
- What is the current and planned (within the IT Master Plan) IT infrastructure? How it should be tailored to suit the proposed GIS implementation
- How should the relationship be defined with decentralized entities such as utilities in other governorates?
- What are the GIS ‘framework’ layers needed for the Clearinghouse? N.B. ‘Framework’ GIS layers are usually characterized by the following:
 1. Mostly used to geographically reference other GIS layers (e.g., administrative boundaries, localities, roads, land lots, ..)
 2. Are needed by a majority of GIS users
 3. Mostly have nation-wide coverage (not local)
- Cost / budget issues.

-
- What is needed to make a shift in attitude from 'My data ..' to 'Sector data ..'?
 - Are efforts needed to raise awareness in the Sector on:
 1. The importance and potential of GIS?
 2. The need for the GIS project, and its incorporation into the IT Master Plan?
 - What type of relationships are needed between GIS and other information systems (integration / interfacing / data exchange)? What are other system that would benefit from assigning a geographical/mapping dimension to their information sets and applications?
 - How can GIS best contribute to better sector planning and operational performance improvement?

ANNEX 9 – PHASING OF ITMP COMPONENTS

Suggested Phasing of ITMP Components



ANNEX 10 – ESTIMATED FUNDING NEEDS BY COMPONENT

<i>\$Millions</i>	YEAR	YEAR	YEAR	YEAR	YEAR	TOTAL
	1	2	3	4	5	
ITMP Component						
1. HQIT Organization	3.65	2.54	1.41	0.67	0.35	8.63
2. Asset - Maintenance Management - Supply Chain	-	3.67	1.40	0.29	-	5.37
3. Executive Information System	-	2.34	0.06	0.02	-	2.42
4. Back Office Systems	1.55	0.07	0.07	-	-	1.70
4.1 Budget Preparation	0.30	-	-	-	-	0.30
4.2 Projects Management	0.39	0.02	0.02	-	-	0.43
4.3 Human Resources Management	0.42	0.02	0.02	-	-	0.47
4.4 Legal (see note 1)	-	-	-	-	-	-
4.5 Lands	0.45	0.03	0.03	-	-	0.51
5. Collaboration and Web Readiness	0.17	0.01	0.01	-	-	0.19
6. Infrastructure, E-Readiness and E-Government	3.91	0.10	0.10	-	-	4.11
GRAND TOTAL	9.28	8.74	3.06	0.99	0.35	22.41

Notes:

1. Given the sector's decision to proceed with the X7 rollout, CIS/Billing (including any process work) is assumed to be internally funded
2. The Legal system is developed entirely internally within the Collaboration suite, so no external funding is required.
3. Infrastructure cost estimates include the request received from NGWA after formal closure of the Working Group process

ANNEX 11 – OVERALL ITMP BUSINESS CASE

\$M throughout

Assume Discount Rate = 10%

ITMP COMPONENT TANGIBLE BENEFITS	PV (Benefits Only) at start of implementation	Implementation Deferred (Yrs)	PV (Benefits Only), Adjusted for Delayed Start of Implementation
HQIT	Not Applicable		
AM-MM-Supply Chain	19.74	2	16.31
CIS/Billing	11.55	0	11.55
EIS	Not Readily Quantifiable		
Back Office Systems	Not Readily Quantifiable		
Collaboration	Not Readily Quantifiable		
Infrastructure	Not Applicable		
Total PV of Benefits, Adjusted for Delayed Start of Implementation			27.86

ITMP COMPONENT DISBURSEMENT SCHEDULE	
Year	
1	9.28
2	8.74
3	3.06
4	0.99
5	0.35
	<u>22.41</u>
Total PV of ITMP Costs	20.73

Estimated NPV of the ITMP 7.13

ANNEX 12 – GTZ TENTATIVE IM HANDBOOK LAYOUT

#	Chapter	Responsible
A	Background and Purpose	SCWS
B	General Information Management Rules and Regulations	
B.1	Data Management Roles and Responsibilities	SCWS
B.2	Intellectual Property and Copyright	SCWS
B.3	Data Classification and Use	SCWS
B.4	Public Communication Strategy	SCWS
B.5	Electronic Filing	SCWS
B.6	Data Sharing with External Users	SCWS
B.7	Individual Computer Use Rules	IT Master Plan
C	IT Operations	
C.1	Information Resources	IT Master Plan
C.2	Risk Assessment and Treatment	IT Master Plan
C.3	IT Security	IT Master Plan
C.4	Data Access Control	IT Master Plan
C.5	Communications and Operations Management	IT Master Plan
C.6	Information Systems Acquisition, Development and Planning	IT Master Plan
C.7	Software Development	IT Master Plan
D	Internet Use	
D.1	Internet Use Regulations	SCWS
D.2	Web Site Publication Standards	IT Master Plan
E	Executive Information System	IT Master Plan
F	Water Related Information Systems	
F.1	Water Sector Information	SCWS
F.2	Water Management Information System (WMIS)	JVA
F.3	Bulk Meter Flow Operation (BMFO) System	SCWS
F.4	Laboratory Information Management System	WAJ Labs
F.5	Water Information System (WIS)	SCWS
G	Back Office Information Systems	
G.1	Financial Accounting System (FAS)	IT Master Plan
G.2	Human Resources Management	IT Master Plan
G.3	Payroll	IT Master Plan
G.4	Projects	IT Master Plan
G.5	Budget	IT Master Plan
G.6	Legal	IT Master Plan
G.7	Lands	IT Master Plan
G.8	Geographic Information System	IT Master Plan
H	Asset Management	IT Master Plan
I	Supply Chain	IT Master Plan

#	Chapter	Responsible
J	CIS / Billing System	IT Master Plan

The IM Handbook chapters are not final. They are only the starting point of a continuous process. The IM Handbook shall be implemented as a web document on the MWI intranet. SWSC may start the implementation activities. Whenever the ITMP project is operational it should continue the endeavour.