

**Achievement of Market-Friendly Initiatives and Results Program
(AMIR 2.0 Program)**

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**Geographic Information System (GIS) Application
Preliminary Assessment**

Final Report

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This report was prepared by Mr. Mohamed Khatouri, in collaboration with Chemonics International Inc., prime contractor to the U.S. Agency for International Development for the AMIR Program in Jordan.

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A. Introduction

This trip report describes the tasks associated with an initial scoping mission of the use of the Geographic Information System (GIS) by the Microenterprise Initiative (MEI) of the AMIR Program, which was conducted from July 21- 25, 2002 at the Program office in Amman. The major tasks associated with this first trip included:

- Background interviews related to understanding the MEI activities within the context of the development of the GIS
- Initial determination of how the MEI component can use the GIS tool to enhance planning and management of some of the activities within the component, for example, in the area of BDS and MFI development.

Ms. Suhair Al Khatib, the Business Management Specialist of the AMIR Program, served as the primary point of contact for the implementation of this initial GIS scoping assignment. She also developed the program and attended all the meetings (see Annex A).

A GIS is a computer-based system that compiles, stores, manipulates, analyzes, and visualize spatial data in digital form to solve planning and management problems. GIS data sets are made up of layers or collections of geographic objects called features showing for instance the location of country boundaries, cities, streets, and project sites. The map layer represents the location of objects specified by their coordinates (x,y). Each feature is linked to an attribute table, which contains all the known information. Both components have to be linked in order to have the full functionality of the GIS. The link between the map features and their attributes allows the user to query any specific information in the table and display it on the map or identify a feature on the map and see all the information about it in the attribute table.

The microfinance sector in Jordan has grown significantly in the last few years, resulting in a large number of institutions providing financial and business services throughout the country. Multiple donors are currently involved in supporting different microfinance institutions sometimes competing for the same client base in the same locations, while other locations are under-cover. Also the growth and expansion of certain MFIs have resulted in the need for the opening of new branches outside of their primary focus area. All these tendencies point to the need to link the information database with the geographic location to facilitate the monitoring, analysis, and planning of the microfinance development and growth.

GIS is an efficient tool that can be used to address many of the issues addressed above such as analyzing the spatial repartition of the current microfinance institutions and for each MFI the spatial repartition of its loans and determining new areas for expansion. It is a flexible and expandable tool and many other uses can easily be added as the supporting dataset becomes available.

Based on the rapid assessment of the integration of the GIS as a tool to improve planning and management of the MEI program, we come up with four initial applications:

1. application to geo-reference all microfinance institutions in Jordan,
2. application to enhance the Management Information System (MIS) for each MFIs,
3. geo-reference the BDS Providers and Facilitators, surveyed by AMIR Program, and
4. geo-reference the 21 Enhanced Productivity Centers (EPCs), that are established by the MMIS, which was contracted by the Ministry of Planning to create these centers throughout Jordan with two advisors for each center in 2002.

B. Geo-referencing Microfinance Institutions in Jordan

B.1 Background

This GIS application will address the identified need for developing a mapping application for the analysis of spatial patterns and relationships of all microfinance institutions supported by different donors in Jordan. The idea is to be able to locate on a map all MF providers and then click on any one of them to generate a variety of information about these institutions. This objective could be easily accomplished using GIS datasets, which include a layer of points identifying exact locations of all MFIs linked to an attribute database containing all the information of interest. In addition it will provide basic information about the BDS Providers/Facilitators and the EPCs mentioned above.

B2. Objective

The main objective of this activity is to help create a GIS application for AMIR MEI component and partners to organize information about existing microfinance institutions in an integrated manner using a GIS tool to enhance their ability to plan and coordinate microfinance support activities in Jordan.

Many GIS attributes, such as its inherent power to present data in its true spatial relationships, its advanced visualization and display techniques, its capacity for alternative strategies and monitoring results, suggest potential applications that go beyond the current objective.

B3. Approach

Two approaches could be envisioned for developing the desired product:

- 1. Build the capacity first.** During the first phase, develop a GIS capacity for one of the local partner institutions with emphasis on meeting GIS operational requirements for data digitalization, application development, and map

production. This phase would involve the creation of a GIS unit by procuring GIS hardware and software and training staff assigned full time to the GIS development. During a second phase, the GIS application would be developed gradually with full participation of the GIS trained staff in term of design, data acquisition, and production. The advantage of this approach is that it contributes to building the local capacity, which will increase the chance of the sustainability of the use of GIS to update and develop more GIS products as needed. However, this approach usually needs sufficient human and financial resources and long term commitment to succeed. It also takes a long time to produce a final product.

- 2. Develop a product first.** Focus first on the development of a pilot GIS application to show how GIS can be used as an efficient tool to enhance planning and management of geo-referenced data. The presentation of the final product will serve as a dissemination tool and a means to involve potential users to invest resources needed to address other GIS applications. This approach has the advantage of producing a usable product in a short time without investing extra financial resources for hiring GIS staff and procuring hardware and software before having an initial product. The disadvantage is that the GIS product would be in the form of a map or an application on a CD representing a situation at one point in time. Updating of data or enhancement of the product would require further effort, which may be addressed efficiently by hosting the GIS application with one of the partner institutions willing to support the creation of a GIS unit.

The second approach seems to be the most appropriate approach to achieve the current objective of a snap shot of the microfinance sector in Jordan. Elements of updating the information could be addressed after the first product is delivered and a clear vision of using GIS on a continual basis is well defined.

The following sections describe the general requirements for the development of the current GIS products.

B4. Base Maps

One of the first steps in building the GIS application is to identify a general map representing important layers of administrative and infrastructure information to serve as a basis for representing and analyzing the spatial location of microfinance institutions. Several maps have been developed for the country in different forms and in different scales. Important layers to integrate into the present GIS application include the following:

- Administrative limits (governorates, districts, and sub-districts)
- General infrastructure (primary and secondary roads)
- Principal cities and towns.

Implementation of this application will be greatly accelerated if the base maps are already available in digital form. One the preliminary task is to investigate the form, the scale, and the availability of this data in digital form. We have been told during our visit to the Royal Geographic Center that the following data is available and can be procured easily:

- Topographic maps at the scale of 1/250,000, available in digital form (in Vector data) for the whole country. It would take around 13 maps at the scale of 1/250,000 to cover all of Jordan.
- Topographic maps at the scale of 1/50,000, available in digital form for most of the country.
- Large scale maps (scale 1/10,000 to 1/25,000) available in hard copy map form only.
- Orthophotos at a scale of 1/2500 for all of Amman City.

Info Graph Company also confirmed the availability of data in digital form. Info Graph is the local ESRI representative for the local procurement of GIS ARC/INFO and ARC/VIEW licenses. In addition to having digital maps of all of Jordan at the scale of 1/250,000, they also have all of greater Amman in digital maps at the scale of 1/2500.

We requested that Royal Geographic Center and the Info Graph send the list to AMIR of all available digital data along with the price for procuring each product. We anticipate that the scale of 1/250,000 would be large enough to serve as basic maps for the present GIS application.

In addition to the digital layer of the base maps, all important information associated with each feature, such as the demography for each town and city, should be added into the attribute tables to facilitate GIS analysis. Integration of basic information into the present GIS application should be limited in the beginning to the strict minimum required to meet the assigned objective.

B5. Microfinance Institutions GIS Layer

Location

The location of each microfinance institution could be presented on a map by a point defined by its x and y coordinates. The coordinate of each point can be extracted either from a geo-referenced map or calculated using a hand held Global Positioning System (GPS) unit at the site. The location of all microfinance institutions, including their branches, will constitute the main layer to be integrated into the GIS.

A GPS is a system that uses an advanced triangulation method to calculate the latitude and longitude of any place on the earth from satellite transmitted data. Coordinates of each location are read into the GPS and then downloaded directly into the GIS using GPS

download software. Some GPS receivers also have the ability to store the attribute information in addition to position information. Handheld GPS with accuracy up to 10 meters are available in the local market in Amman. The price depends on the model and additional features included. The price in the USA for handheld GPS varies from \$ 120 (Garmin model eTrex or Magella GPS 30) to \$ 1,000 (Garmin StreetPilot III).

The extent of the data production effort relies on many factors, which require the investigation, inventory, and preparation of source materials. These factors include the type of MFIs to include and the availability of a list with the exact location of each one. Currently there are around 14 microfinance providers in Jordan. Four of them are supported by AMIR Program (AHLI Micro-financing company, Jordan Micro Credit Company, Microfund for Women, and Jordan Access to Credit Project). Each MFI has several branches. Other institutions such as community-based organizations and cooperatives also provide loans.

The complete list of microfinance institutions could be obtained from the Ministry of Planning or the Ministry of Social Development,. Additionally, MMIS in its effort to create a new Business Development Center is in the process of assembling information about all lending institutions in Jordan, including commercial banks, Government funds, and NGOs. This list will be finalized in two to three weeks. MMIS Director agreed to send AMIR the list when it is finalized.

Attributes Table

For each geo-referenced MFI point, additional information should be obtained and included in the associated attribute table such as total distributed loans, number of loans provided, funding donor, targeted sectors, repayment rates, loan average size, minimum and maximum loans, interest rate, percent of loan dispersed to women, amount dispersed to women, and total staffing.

The Microfinance Donors Group presented information about 7 Microfinance projects that are currently supported by some donors, which included USAID (AMIR), Canada-CIDA, CARE int., European Union, and JICA. Annex B presents the form of the information presented for each project.

The final list of information to be included in the attribute table must be based on a thorough understanding of the need for its use along with its availability and accessibility. All attributes should be structured and standardized to facilitate their integration into the GIS and later their use in the analysis and visualization on a map.

B6. Micro Entrepreneur Centers Layer

A GIS layer containing points representing the location of the EPCs and the BDS Providers/Facilitators could be developed the same way as a microfinance institution layer.

GIS Application for MFIs

As MFIs grow and reach a large number of customers spread all over the country, their need for efficient information systems increase. AMIR Program assisted four MFIs in developing their Management Information System (MIS), which include the basic information about each borrower in a computer database, generated from the borrowers application forms and bank's loan information and monitoring data. The database usually includes information about the location of the borrower including the city, the district, the sub-sector, and the address. Linking the current information included in the MIS to the GIS could result in a more efficient tool that uses spatial queries and analysis.

Applications of the GIS for MFIs are unlimited and include the following examples:

- Locate densely populated or traffic intensive areas for the establishment of new branches.
- Define branch service areas by population indicators (e.g. number of families, number of enterprises, income groups).
- Identify areas that are not adequately covered with current services.
- Analyze the MFI's market share with specific target groups (women, self-employed, shop owners).
- Develop customer-oriented marketing.
- Identify risk by analyzing overdue loans by district and zones.

Most of the MFIs managers we talked to expressed great interest in integrating the GIS in their MIS technology. However, for the GIS technology to be used efficiently by the MFIs, it has to be fully supported and developed by them. Initial technical support could be provided to design the system and train the staff.

D. Next Steps

This first phase of the GIS scoping mission was very helpful in many aspects. It helped us develop an initial understanding of the MEI component of the AMIR Program in relation to the development of the GIS. The following points summarize our recommendations for the next steps for the development of a geo-reference MFIs application in Jordan.

1. Procure and review of the general digital data to serve as base maps for the GIS application (maps at scales 1/250,000).
2. Compile a complete list of microfinance institutions to include in the GIS application.
3. Design the structure of the information (attributes) to be collected for each microfinance institution to be included in the GIS.
4. Define the scope and extent of the microfinance location points (geographic layer) to be collected and integrated into the GIS application using available maps and GPS technology.
5. Procure the GPS and GIS software to support the development of the GIS application.
6. Start the integration of the available graphic and attribute data into the GIS application as it becomes available.

Identify the host to house and update the information.

ANNEX A**MEETINGS**

Saturday 20 July.

Arrival

Sunday 21 July

- Arwa A. Hamdieh. Program Management Specialist, USAID
- Youssef M. Kandah Assistant General Manager, Ahli Micro-financing Company L.T.D
- Mamdouh Alsharif. Operations Manager, Ahli Micro-financing Company

Monday 22 July

- Bassem Khanfar, General Manager, Microfund for Women
- Terri Kristalsky. MEI component Leader. AMIR Program
- Jamil El Wheidi, Microfinance Specialist Microenterprise Initiative AMIR Program
- Winki Williamson Project Manager, DFID Capacity Building Project

Tuesday 23 July

- Fawwaz ElKarmi, Director MMIS
- Ramzi N. Kawar Chief Executive Officer, Community Development Group.

Wednesday 24 July

- Khalid Al-Gazawi, Deputy Executive Director, Jordan Micro Credit Company.
- Ghassan Mkhaimer, GIS/GPS specialist, Royal Geographic Center.
- Mazen Joanih, Executive Director, Info Graphic.

Thursday 24 July

- Arwa A. Hamdieh. Program Management Specialist, USAID/Amman
- Fares N. Shadad. Computer Management Specialist, USAID/Amman
- Rafael J. Jabba, CHF-Jordan Country Director
- Terri Kristalsky. MEI component Leader. AMIR Program

Friday 25 July

Departure.

ANNEX B**MICRO-FINANCE PROJECT DATA FORM**

MICRO-FINANCE PROJECTS IN JORDAN	
Micro-Finance Core Project Details	
Tile	
Project partners	Jordanian/direct/indirect/intermediaries
Source and amount of funding	Amount of capital. Donor contribution and form of funds (grant/loan etc)
Project value	Total value/possibility broken down into technical assistance and fund for loans/credit
Project Timing	Start date/Duration/Phase
Loan Purpose	Business? Start-up or existing
Target Group/ Beneficiary profile/Clients	Location Urban/rural Gender: Men/Women Age: Youth/Mature Physical ability: Able bodied/Special needs Povert group: Destitute unable to work; poor but able; Bankable poor; near poor.
Project Objective/Purpose	Economic/Social/Empowerment/ pro-poor/employment generation/ etc as stated in project documents as purpose (logframe) or immediate objectives (UN)
Sector	Agriculture, social development, energy, environment etc Any sector excluded?
Loans & Delivery Mechanisms	
Loan Size	Maximum, Minimum, average
Interest rate charged	If possible, provide breakdown of how calculated so that different costs can be identified
Application charges	Is an application charge or similar fee levied?
Duration of the loan	Total duration
Grace Period	Whether a grace period is allowed for/what it is
Installment payments	How often installments are paid
Recipient Unit	Individual/Group
Collateral	What form of security/Collateral is required
Decision-making	Who decides who gets a loan- On what basis (the person or the viability of the business?) Is it conditional? How is that determined?
Delivery System	Is the delivery direct or through intermediate? Are the deliverers dedicated micro-finance specialists? Is the community involved?

Staffing	Dedicated staff/support staff/staff who do MF as part of broader duties
Performance	
Number /scale of operation	Number of loans given since start date Number of active borrowers Total value of current loans
Cost of Delivery	
Sustainability	How is “sustainability” defined? What is evidence of level of operation sustainability Finance?
Repayment Rate	What % of repayment? What % of defaulters? What is the write-off strategy?