Guidelines for Management Information Systems in Social Funds

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Foreword

The idea for this document developed from experiences in many social funds (SFs). SF management information systems (MIS) were proving to be time-consuming to develop, required repeated improvements and adaptations, did not easily capture essential information in report outputs, and were difficult to integrate in the SF project teams as essential management tools. In addition, SF Task Managers, most of whom had little familiarity with the technical aspects of MIS, were unable to adequately guide MIS preparation. MIS for SFs are often difficult to conceptualize during preparation because of the specific characteristics of SFs, in particular design flexibility and demand-driven processes. Although several MIS provide good monitoring outputs for SFs, and some are used as basic management tools, they are often not designed for maximum efficiency and frequently require more or less constant up-dating, which is costly both in terms of financial and human resources.

This document does not provide a standardized MIS for all SFs, nor does it suggest a magic formula that will make it possible to prepare an MIS in a couple of weeks. It does identify critical aspects of MIS, suggests ways of organizing preparation of an MIS and provides practical advice for those involved in the design and management of MIS for SFs and others working on similar types of demand-driven projects.

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Abstract

Management information systems, which include both systems with information for management and systems that manage information, have four elements: the **actors** who take decisions on the project; the **data** and information that is useful for decision-making; the **procedures** that determine how the actors relate to the data; and the **tools** that facilitate the collection, analysis, storage and dissemination of the data.

Social funds have a number of characteristics that make their information needs different from those of other projects or organizations. These characteristics include:

- a demand-driven approach that makes precise planning impossible and flexibility a must;
- a large number of contractors, often with limited management capacity;
- a very large number of small contracts and disbursements, with disbursements frequently taking place in tranches;
- a variety of procurement methods, with a preponderance of community-based procurement;
- operations in different sectors requiring a wide range of skills, monitoring approaches, service providers and contacts;
- frequent decentralization of management activities;
- frequent sub-contracting of important activities, such as outreach, monitoring and evaluation;
- an anti-poverty agenda requiring the selection and monitoring of specific indicators for evaluating impact;
- multiple stakeholders (government, donors, communities, contractors, NGOs, etc.), each with distinct information needs;
- political visibility, making transparency and efficiency all the more important.

The guidelines identify the basics of MIS design --why is an MIS needed, what an MIS will do and will not do, what one must know before starting, and what are the main components of an MIS. The primary recommendations for preparing MIS for social funds are:

- take time for needs assessment, find out about local information technology capacities, and what information is needed and by whom;
- don't reinvent the wheel, examine what has been done in other social funds and in other similar projects;
- make it modular, integrate all information needs, including accounting, into a single flexible system with a common central database;
- be (almost) ready when the project starts, otherwise information will be lost and heavy workloads will be required to catch-up.
- be careful in the transition from design to implementation, lack of continuity can lead to delays;
- be flexible, evolve with the project, modularity allows this;
- evaluate once a year, pick-up problems early.

Acknowledgments

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CHAPTER 1

The Basics

QUESTIONS THAT THE CHAPTER WILL ANSWER:

Why is information management so important? What is an MIS (and what is not)? What is special about the MIS of a social fund? What will I find in these guidelines?

Why is information management so important?

Managers are often far from the real action, so they need something that will tell them what is going on (in both quantitative and qualitative terms). Luckily, the rapid evolution of tools for collecting, analyzing and diffusing information has greatly improved our ability to manage from a distance. However, the speed of technological change means that changes in management practices and tools are inescapable. It is better to think ahead than racing to catch up or go out of business.

Good knowledge management systems build on the strengths and successes of the organization while drawing lessons from earlier failures. These systems do much more than simply facilitate daily tasks. They influence the organization of work, and therefore the professional relations inside and outside the organization. In fact, an effective knowledge management system links intimately to the decision-making process by regulating and organizing the flow of information accessible to decision-makers. Its evolution, therefore, has a direct impact on the decision-making system and consequently on the structure of the organization. For example, modern information systems often allow more direct contact between managers and front-line staff, changing the role of the intermediate organizational levels or eliminating them entirely.

It is difficult to define precisely the limits of a management information system (MIS) and different managers will have more or less expansive definitions. However, accounting information is not enough to manage an organization or a project, regardless of its richness and central role for management --and on top of it, in most cases it is under-exploited and not well organized for management purposes. Effective management requires the use of non-accounting information as well, including information on planning, quality of outputs, performance of staff and service providers, etc.

Because accounting information has long been considered the hard core of management information, there has been considerable effort to standardize accounting systems and to make them as useful as possible for running an enterprise. Several accounting software programs based on widely recognized accounting standards are easily available. In contrast, the debate continues as to the non-accounting information needed, or at least useful, for management. Because managers tend to think that their problems are unique, non-accounting information systems tend to be designed and produced on a case by case basis. So the wheel keeps being reinvented, wasting money and time for results that are often far from ideal.

What is an MIS (and what is not)?

One definition is a tool to collect, analyze, store and disseminate information useful for decision-making in a project. This tool generally consists of accounting software plus a database management system for planning and for non-accounting information. A geographic information system (GIS) may be added to display data on a map. This definition, however, is too restrictive because it equates an MIS with a bunch of computers and cables, something technical that managers do not feel competent to discuss[1].

So, what else is there to an MIS, besides software and hardware? Information systems in general, including both systems with information for management and systems that manage information, comprise four elements:

- the **actors** who take decisions on the project;
- the **data** and information that is useful for decision-making;
- the **procedures** that determine how the actors relate to the data;
- the **tools** that facilitate the collection, analysis, storage and dissemination of the data.

All four elements are important and necessary. Without a needs analysis that includes all actors, an operational manual that explains who does what and when (not just how to use the software) and a database structure, computers and software programs are likely to be almost useless and become a toy for specialists. If key actors are not part of the design process, there is a risk that MIS specialists will push for the development of additional features regardless of their value-added in terms of efficiency or effectiveness.

To define an MIS, the following questions should be answered:

Actors Who will use the information, to take what decisions and who will provide this information?

Data What information is needed and therefore what data needs to be collected? How should data collection be organized to avoid duplications and inconsistencies, and minimize data processing?

Procedures Who does what and when so that information is collected, entered, analyzed and distributed to the right people? That is to say, what should be the interaction between actors and data, and between the actors themselves?

Tools What tools are needed to carry out the procedures? (finally the technological stuff!) In other words: what do you need to get what you want without drowning in technology or providing long-term employment for specialists?

[1] Thus, managers leave the design and set-up of the system to specialists, leading to problems later on with the utilization of the system. Moreover, even if the managers express their needs, other operators of the system often feel excluded, so that, after the novelty of the system has worn off, they do not provide information that is not useful for them.

What is special about the MIS of a social fund?

MIS development and implementation is not a new frontier or an uncharted field. Lots of people are conducting research and accumulating experience on various aspects of MIS, and consequently a huge number of articles and books have already been published on this topic. So, why bother with special guidelines for the MIS of social funds? Because social funds have a number of characteristics that make their information needs different from those of other projects or organizations. These characteristics include:

- a demand-driven approach that makes precise planning impossible and flexibility a must;
- a large number of contractors, often with limited management capacity;
- a very large number of small contracts and disbursements, with disbursements frequently taking place in tranches;
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- multiple stakeholders (government, donors, communities, contractors, NGOs, etc.), each with distinct information needs;
- political visibility, making transparency and efficiency all the more important.

What will I find in these guidelines?

These guidelines are meant to be a practical tool to help those who are setting up or managing a social fund navigate in MIS waters. They do not expect the reader to have a technical background, so jargon is (hopefully) kept to a minimum and a glossary of technical terms is in Annex 1. But they also hope to offer something of value to the "experts", and Technical Boxes have been included especially for them. Unfortunately, we do not have magic formulas for setting up or updating an MIS in a couple of weeks, because MIS are individually designed systems that require thorough needs analysis and specialized development. But the experiences reviewed in preparing this document make it possible to provide at least some guidance on how to go about different aspects of MIS design and implementation, and how to avoid some common pitfalls. Keep in mind that, despite the best plans and the smartest advice, Murphy's law tends to apply to MIS: everything that can go wrong, will go wrong. Patience and perseverance are essential, and it will help remember that it took years to develop some of the fancy systems described in the coming pages.

Besides not providing a magic MIS formula, there are other things that these guidelines will not do. One of them is listing of recommended MIS software and experts, for two reasons. The first is that we want to avoid being sued by software companies or consultants who are not in the list. The other is that rapid changes in technology would make this information quickly obsolete.

Chapter 2 (*What Type of MIS do I Need?*) is meant to help readers determine the MIS that will best fit the needs of their social fund, and avoid paying for the MIS that will best fit the needs of the MIS expert they hire. It will describe what an MIS should include at a minimum, as well as additional features that might be useful as coverage and budgets become more ambitious. By the end of the chapter, readers should have an idea of the different options realistically available to them, including their approximate costs; they

should be able to explain the MIS design they want without being laughed at; and they should be ready to tackle implementation issues.

Chapter 3 (*How will the MIS be Designed, Developed and Put in Place for my Project?*) focuses on implementation issues by detailing the steps needed to actually develop an MIS and put it in place. This chapter should be useful for planning purposes, and for avoiding the helpless feeling one has when entirely dependent on "experts". This chapter should also be useful for MIS experts who want to be able to communicate with non-specialists.

Chapter 4 (*How will I get the Best out my MIS?*) is for those who did not benefit from these guidelines when their MIS was set-up, and have now realized that they are stuck with a system that leaves much to be desired. It provides information on how to analyze existing MIS, how to make the best of what you have, and how to take steps for improving it. Keeping in mind that at times the best thing one can do is to start over.

The annexes provide a glossary of technical terms (Annex 1), and a series of sample terms of reference for designing, developing and putting in place an MIS (Annex 2-5). Annex 6 is a checklist to be used by task-managers for assessing the scope and use of an MIS. Annex 7 gives sample reports that an MIS could produce.

CHAPTER 2

What Type of MIS do I Need?

QUESTIONS THAT THE CHAPTER WILL ANSWER:

Who needs what information? How do I identify my project management information needs? What are possible ways to organize the MIS? What are common mistakes to avoid? What are examples of good practice? How do I choose a system appropriate for my needs? What criteria should I use?

Who needs what information?

As indicated in Chapter 1, the first question to ask when putting in place an MIS concerns the different actors involved in the social fund: Who uses what information to make what type of decisions? The response to this question will be different for each social fund and therefore requires special attention in each case (see Annex 2 sample terms of reference covering needs assessment). This much said, chances are that the information needs of the main actors (social fund management, social fund staff, government and donors) will revolve around the issues identified below. These issues can be a starting point for more detailed needs assessment.

Social Fund Personnel

The daily work of the social fund (outreach, identification of target groups, assistance in microproject preparation, review of applications, monitoring of implementation and evaluation) generates --and is supported by-- large amounts of detailed data on each microproject, which are collected throughout the lifetime of the microproject. The themes covered include:

- promoters/beneficiaries (their socio-economic status, location, organizational structure, living environment, previous experience with the social fund, etc.);
- contractors and intermediaries (their addresses, areas of operation, references, etc.);
- technical data on the microproject and its progress (sector/subsector, technical characteristics, performance indicators);
- contract monitoring (specific clauses, deadlines, etc.);
- financial management and accounting (budgets, commitments and disbursements).

In addition, the day-to-day operation of the social fund requires data on its internal functioning, such as:

- human resources (organigram, composition of various units, leave schedule, personnel evaluations, etc.);
- physical assets (supply stocks, vehicle movements and maintenance, etc.);
- overall financial management and accounting (budgets, commitments and disbursements for the agency as a whole, withdrawal applications –obviously, this information will build on that for individual microprojects).

All of these data, often called operational data, are detailed, dynamic and diverse. They allow social fund personnel to take decisions on disbursements and guide their day-to-day activities (decisions regarding field trips, visits or calls to contractors and intermediaries, etc.) Operational data are also processed to prepare the management information described below.

Social Fund Management

Social fund management must take decisions on three major areas in which information needs tend to be fairly clearly defined:

- selection criteria for microprojects, requiring information on local needs (socioeconomic profile of beneficiaries, geographic location and sector of proposed intervention), and information on activities already undertaken (microprojects financed by sector and by location);
- interventions in problem microprojects, requiring performance indicators and performance criteria to identify problems;
- work organization within the social fund agency, requiring information on the internal performance of the different parts of the agency (analytical accounting, discussed later, can be an important part of this).

Management, therefore, needs information that is either aggregated, such as total disbursements for the month, or selected according to specific criteria, as in the case of problem microprojects. This information, often called management information, has to be available in different forms: time series, maps, statistical summaries, etc..

Government and donors

The government plays a dual role *vis a vis* the social fund, both a control function and a strategic or policy function. Therefore it requires two types of information:

- for its control function it needs access to financial, accounting and procurement information;
- for its strategic function (the social fund generally being part of a broader anti-poverty strategy); it needs to know the impact of social fund activities broken down by categories such as location, sector, beneficiary group and year/month.

Donor information needs are similar to those of government: detailed information to monitor procurement and disbursement, aggregate information to measure impact.

Two caveats and a visual summary

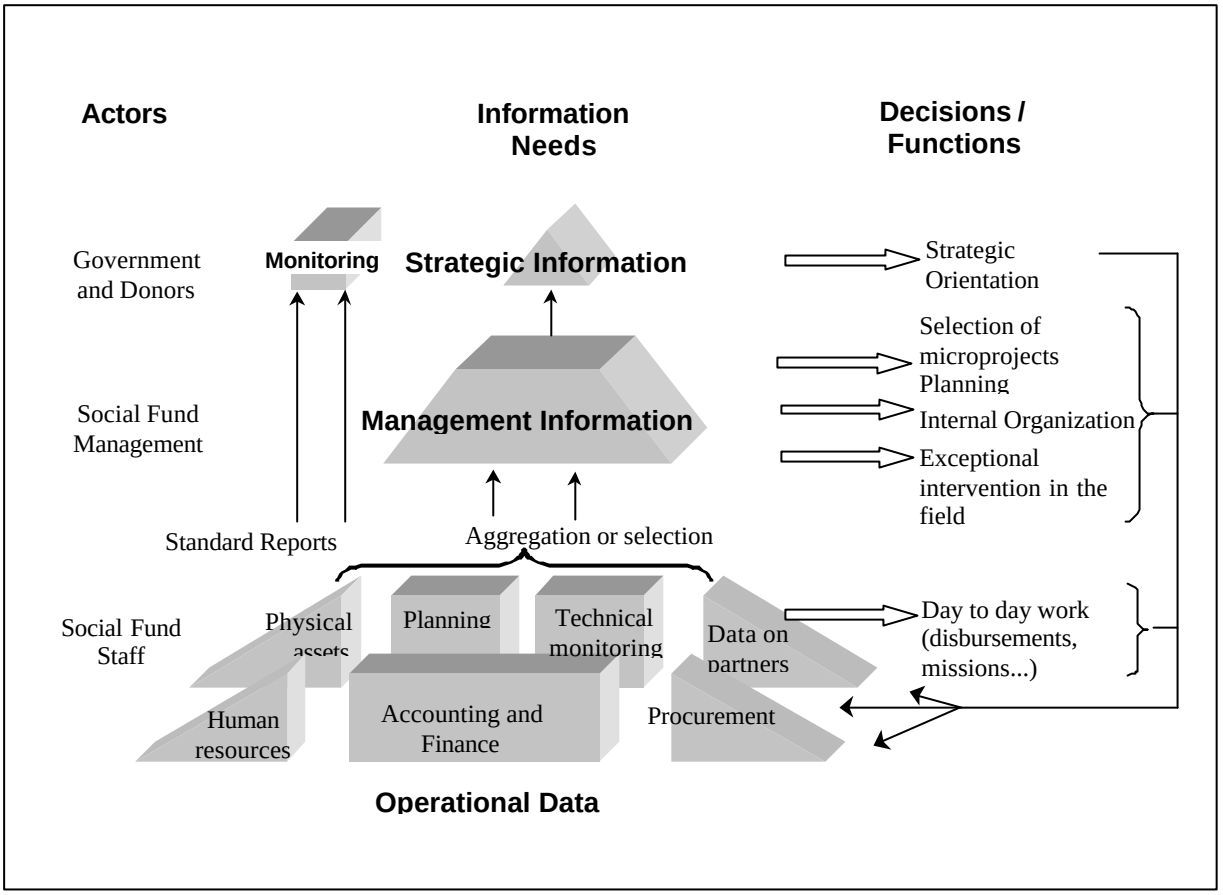
Paying attention to the above should help avoid two common pitfalls when putting in place an MIS.

1- The first pitfall is to forget to involve social fund staff, who are actually the operators of the system. They are responsible for entering the operational data without which management information cannot be produced. In many social funds, personnel perceive the MIS basically as a nuisance, because the MIS was imposed on them. Consequently, data entered are often of bad quality. If operators do not see the use of the data they are entering, they will not make the effort to be precise and thorough.

2- The second pitfall has to do with data processing and reporting. Reports sent to managers often consist of lists of raw data from which mangers have trouble drawing the critical information they need to take decisions. This is because managers were not asked about their specific needs in terms of information, including the format in which the information should be presented.

The following chart summarizes the information needs of the different actors.

Figure 1 - Information Needs in a Social Fund



How do I identify the specific management information needs of my project?

Beyond the general analysis of information requirements, you will need to know how to go about defining the particular needs of your social fund. This section discusses different types of information usually required for a social fund to perform well.

Financial and accounting management

Multiple demands on the financial and accounting system should be taken into consideration from the beginning of the design stage. The main requirements concern accounting, financial reporting and auditing, and they can be different depending on the country and on the donor[2]. Before going into detail for each of them, it is important to keep in mind that problems often come from different requirements

[2] The World Bank requirements in terms of financial and accounting management are summarized in OP.BP 10.02, August 1997 – Financial Management.

Technical Box 1 - Specific issues for accounting information

Basic accounting information. It is not possible to have a standard Chart of Accounts to fit all projects because each project has specific needs, including the need to follow the Chart of Accounts applicable at the national level. The information for each entry on a specific account should include: the type of account (cash, funding source or expense), the category (goods, training, consultants, etc.), the funding source, the budget line, and a narrative description.

Account keeping. Cash-basis accounting is often recommended because it is simple and it is acceptable to the World Bank, particularly for social funds because they are "non-revenue-earning" organizations. However, accrual-basis accounting may be a national requirement. Moreover, optional accounting functions enabling accrual accounting (payables, receivables, etc.) may be necessary depending on the specific needs of the project. For example, although in projects financed by the World Bank the Value Added Tax (VAT) must be paid by government, it is often paid first by the social fund and later refunded by the government. In such cases, it is important that the social fund accounts for VAT receivable.

Multi-currency accounting. In many cases, it is necessary to use multi-currency accounting (the local currency and the currency of the loan or credit) in order to ensure adequate treatment of transactions carried out in a currency other than the reporting currency. In addition, if the exchange rate between the two currencies is floating, the financial and accounting system should be chosen accordingly. For example, the system in the Bulgaria social fund could only apply fixed rates of exchange, which was sufficient as long as the requested reports were to be in Leva (local currency) and DEM (Deutschmark), but proved unsatisfactory when reports in other currencies were requested –and would prove unsatisfactory should the Leva be allowed again to float against the DEM.

Security. Access controls must be set up so that accounting entries can only be made (or deleted) by qualified operators. Any correction should be made following specific procedures that make it possible to keep track of all changes. In addition, security measures must be in place to ensure that data can only be input or modified from a specific entry point in the system (e.g., microproject disbursement information can only be input or modified through the accounting software). This is even more critical when accounting data are linked to other operational data in a single database.

Laws and regulations. Laws and regulations can profoundly influence the management of financial information. They may, for instance, require centralized financial management. This is the case in Peru, where a national decree requires that all administration of public investments be done centrally. FONCODES, the Peruvian social fund, despite having a very decentralized structure, has had to organize itself so that all financial operations are carried out at headquarters. To meet government requirements while keeping the desired level of efficiency, procedures have been put in place to ensure that the transmission of all receipts to the center takes place daily through batching operations at night.

between governments and donors, which, if not taken into account from the start, may lead to major difficulties later on. For example, in Armenia, the social fund initially purchased accounting software that only enabled accrual-basis accounting, which was requested by the country but not acceptable to the World Bank. Consequently, for a while they had to use the project-monitoring database to be able to maintain a cash-basis accounting, which forced them to enter accounting data twice.

Accounting requirements are for the most part standardized. The International Accounting Standards (IAS), published annually by the IAS Committee, are the most widely adopted by the accounting profession and they are among the accounting standards acceptable to the World Bank. Specific aspects to take into consideration for accounting information are summarized in Technical Box 1.

Needs for financial reporting in a social fund go beyond "old fashioned" accounting and financial reports. These are adequate for "standard" controls and audits, but are increasingly considered insufficient for sound management. Financial reports should include data on different management areas including, at a

minimum, technical performance and procurement. There are strong linkages between procurement and disbursement functions, particularly in community operations such as those financed by social funds. Field level implementation can only be effective if funds are made available on time, and funds can only be efficiently supplied if the procurement process has integrity and is cost effective.[3] In this vein, the Loan Administration Change Initiative (LACI) promoted by the World Bank introduces an integrated project monitoring system bringing together project financial management, disbursement, procurement, contract management and physical progress. The MIS should be able to produce the quarterly Project Management Reports required under LACI (samples are provided in the *LACI Implementation Handbook*, September 1998):

- financial statements that present sources and uses of funds by loan category and project activity;
- project progress reports that present the monitoring indicators and provide explanations on deviations from planned values;
- procurement management reports that provide information on the status of both procurement and contract commitments.

Not only do the auditing requirements influence the MIS reporting functions, but also as the scope of audits becomes broader, the MIS itself is more likely to be subject to review during audits. When this happens, terms of reference for audits include a "management letter" in which the auditor is asked to give comments on the internal control system, including the administrative, accounting and financial manuals and their application. The scope of this management letter can be broadened and the auditor asked to comment on the MIS as a whole.

The tendency for audits to take an increasingly comprehensive approach makes it all the more desirable to put in place an analytical coding for accounting information (see Technical Box 2 for a brief explanation, and Annex 7 for an application). In addition to rationalizing links between different sets of data, and in particular between

Technical Box 2 - Analytical coding for accounting

Analytical coding can be an effective means of linking the subproject monitoring and accounting systems. Each activity of the social fund is given a code and each expense is linked with a particular activity via the code. Using this code, all cost information related to a particular activity (for example, each subproject) is easily accessible. Analytical coding also facilitates the analysis of costs associated with different types of activities (i.e., school construction, nutrition workshops, etc.).

Analytical coding is usually developed ad hoc, according to the needs of the social fund, and as such there are few constraints to its design. In particular, it can be more or less detailed (that is, have more or fewer levels) depending on the monitoring requirements and analytical capacity of the social fund.

An analytical code for a social fund might look like this: the first level would be the component (i.e., the type of subproject -infrastructure building, infrastructure rehabilitation, capacity building, etc.), the second level would be the individual subproject (e.g., health center, school), and the third level would be the phase of the subproject (more or less precisely defined according to the requirements of the particular social fund). Other levels may refer to the geographic region, urban/rural, or any other variable considered important. A code associating each accounting action with a particular stage of a subproject would allow calculation of the cost of monitoring or evaluation. This type of information can be very useful because, for example, a subproject whose supervision costs begin to exceed the average may be a problem project. Linked to technical indicators, this information can identify almost automatically subprojects for which management actions are needed. Also, knowledge of average costs per project phase highlights where the fund activities are concentrated and makes it possible to take personnel, budget and procedural decisions accordingly.

[3] See *Guidelines for Simplified Procurement and Disbursement for Community-based investments* prepared by the Portfolio Improvement Working Group for the Africa Region.

accounting and subproject monitoring data, this coding has the advantage of allowing for detailed cost analysis.

Monitoring of subprojects

To determine what the social fund needs in terms of subproject monitoring, you need to examine (and to be clear about):

- the nature of each project component, and in particular the information needed to monitor its implementation (clearly, the information needs for monitoring a microfinance component[4] are very different from those for an infrastructure component);
- the definition of the subproject cycle in each component;
- the level of monitoring desired at each stage of the cycle (some social funds start monitoring subprojects from the time the application for funding arrives while others start monitoring at the information campaign stage or with initial inquiries of interest).

The influence of these variables on the subproject monitoring system is illustrated by a comparison between the Armenia and the Haiti social fund, in Box 1.

Box 1 - Subproject monitoring in Armenia and Haiti

The Armenian and Haitian social funds are similar in size (about 200 subprojects a year in an area of about 30,000 km2) and in content (essentially construction and rehabilitation of infrastructure). Their MIS have a number of characteristics in common: the organization of modules and data follows the microproject cycle, data are managed by fairly simple software (MS-Access in Armenia and Foxpro in Haiti), and computer specialists are available full-time to take care of maintenance and adapt the system to social fund needs as they emerge. The simple nature of the software results in similar constraints, such as the absence of automatic links between accounting and microproject monitoring. Nevertheless, there are also a number of differences between the two MIS, in great part due to different ways of organizing work.

- The approach to the information campaign phase is very different. For the Armenian social fund, it consists of systematic visits to communities during which a meeting takes place to select a microproject and develop together the proposal for financial assistance; in this case, monitoring of the process leading to a proposal [dossier de promotion] is minimal. In Haiti, by contrast, the proposal is put together little by little and this process is carefully monitored thanks to a checklist of documentation that needs to be assembled.
- A specialized unit in Armenia inputs budget data for subprojects, while in Haiti it is the responsibility of the person in charge of appraising the subproject. This difference has a significant impact on the flow of activities, because the specialized unit in Armenia has become a bottleneck.
- The methods used to prioritize financing choices are very different. As the social fund in Haiti has a special computer module for this task while the Armenian social fund does not.

The Armenian social fund produces very good reports because this was stressed by management during the needs analysis –and taken into account when designing the MIS. The Haiti social fund, by contrast, adapted a pre-existing MIS, which gave less importance to report production.

[4] For monitoring microfinance components, see: Charles Waterfield and Nick Ramsing. *Handbook for Management Information Systems for Microfinance Institutions.* PCGAP, Technical Tool Series, February 1998.

Information on social fund partners

Many social funds collect information on their partners: consultants, NGOs, suppliers, entrepreneurs, other donors, municipalities, promoters/beneficiaries, etc. The type of information needed depends on the number and roles of these other actors. In some cases, simple descriptive information on different actors is enough. In other cases, more detailed data, such as performance evaluations, are included. Many social funds have found it useful to create a system that automatically checks proposed actors against a 'black list' of poor performers and issues warnings accordingly. The creation of such a list requires a set of performance criteria against which actors may be evaluated. An agency that subcontracts outreach, monitoring or evaluation will have different information needs than one dealing directly with the local communities and may need a different type of monitoring system.

Monitoring contracts

Again, information needs can take very different proportions depending on the extent to which the social fund agency carries out implementation directly (contracting of entrepreneurs, appraisal and monitoring of individual microprojects, procurement, etc.). In cases where microproject implementation activities have been subcontracted to other entities, the social fund itself may not have to monitor contracts at the microproject level. The latter is largely the case with the Benin social fund, which relies primarily on intermediary NGOs to monitor the execution of microprojects. On the other hand, the Armenian social fund has chosen a detailed monitoring of all procurement activities related to each microproject, and this requires a comprehensive and detailed monitoring system.

Planning

Information requirements for budget allocation are also highly variable. Some funds try to allocate budgets between components based on experience or based on *a priori* judgments of the relative importance of each component. Other funds use criteria based on geography (equity between regions) and socio-economic factors (rural/urban, dependency ratio, poverty, etc.). An automatic allocation of funds based on pre-established, objective criteria can be important for political reasons. The higher the risk of political interference, the more useful it is to have automatic and transparent decision-making processes to avoid partisan pressure ("It's the computer that makes the choices, not the social fund staff").

Impact evaluation

The most commonly used method to get information on the impact of social investments is to hire consultants for ad hoc studies two or three times during the life of the project (or soon after its closure). Few social funds have a systematic approach that enables them to obtain continuous or at least frequent information on the impact of their investments. This is mainly for two main reasons: first, collecting information to assess socio-economic impact is costly and time consuming, second, impacts tend to be visible only over a long period, making it difficult to determine the extent to which a given change is due to social fund activity. To make matters worse, in many cases the reports from the social impact assessment studies are not linked back to the decision-process of the Social Funds. Reports stay on shelves and no relevant information (be it quantitative or more likely qualitative) is extracted from them.

Linking impact evaluation to the computerized MIS can help improve both the quality and the relevance of the evaluation. Impact assessments require a baseline, that is, a picture of the situation before the social fund intervention, which is then compared to the situation after the social fund intervention. Unfortunately, baseline data are very seldom readily available and accessible from sources outside the social fund. But creative solutions are possible. In their outreach activities, social funds have the

opportunity to collect many socio-economic data that can be used to determine a baseline. This requires that: (a) indicators be defined *ex-ante*, so that socio-economic data to be gathered are identified from the beginning and collected consistently; and (b) the data thus identified be actually entered in the MIS database for storage and processing. In some cases, it is also possible to supplement data collected by the social fund with other data. For example, the MIS of the Peru social fund, which is one of the most sophisticated, has a link to data from the national statistics institute. The two institutions collaborate, providing each other updated detailed information on communities, thus contributing to the creation of an impressive amount of baseline data nationwide.

Reporting

Reports must present information in a way that is concise and easy to understand. In general, most social fund staff will need detailed information on a limited number of items (e.g., the subprojects they actually follow) while managers will need limited (i.e., summarized) information on a large number of items. Ideally, "standard" reports should be produced by the computerized MIS as a matter of routine. For example, it is easy to set-up the MIS to produce a report for each subproject with information grouped by type: accounting and financial (amounts approved, disbursed and committed, community contribution, etc.), technical (type and size of infrastructure, materials, etc.), socio-economic (number of beneficiaries, percentage of women or ethnic minorities, poverty index of the community, etc.) and geographic (district, municipality, etc.). Unfortunately, few social funds have MIS that do this.

More elaborate reports based on aggregation and/or selection of data can also be produced by the computerized MIS, and are particularly valuable to managers, donors and government (see Annex 7 for examples). Examples include summary tables of monthly disbursements and commitments, possibly cross-tabulated with selected variables (e.g., disbursements by region, by component or by sector); aggregate indicators for a specific component, or a phase of the subproject cycle, or a location. Sometimes, using a Geographic Information System (GIS) may help make summary reports clearer and comparisons easier.

How can I organize the computerized part of the MIS?

Modular structure

The basic structure recommended is a modular one in which different functions of the system are managed by distinct modules. Integration of the different modules is done through information sharing via a common, central database. The existence of this central database does not prevent modules from having their own databases. The important point is that all shared information is managed through the common database.

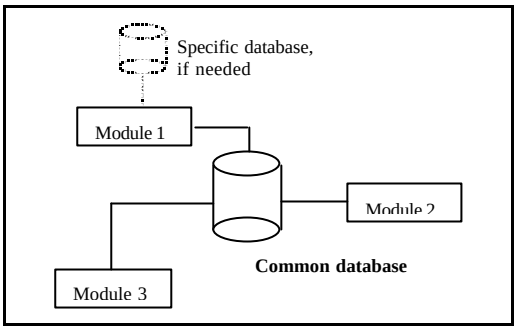


Figure 2 - Modular structure

Given the number of potential functions, many possible structures could be used. In addition, some modules are more important than others. Therefore, three levels of structure are discussed: a basic structure, an intermediate structure, and a complex structure.

Basic structure

A basic modular structure for a management system is shown in Figure 3. The priority modules are those concerning microproject monitoring, financial & accounting management and information on social fund partners, because they must manage the most important information for the project, which is often the most complex and cumbersome as well.

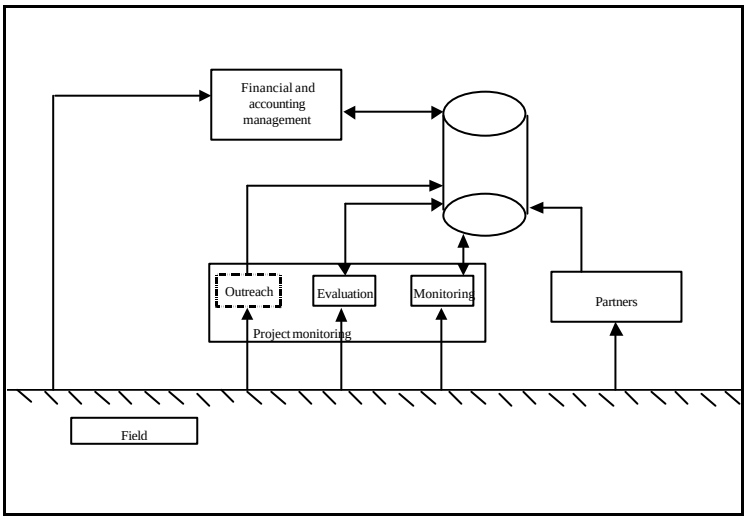


Figure 3 - Basic modular structure

This basic structure facilitates activities and decision-making in the following areas:

- subproject monitoring (access to socio-economic information on beneficiaries/promoters, technical information on microproject implementation progress and critical financial information produced directly by the accounting system),

- financial & accounting, in particular on microproject financing (access to information on project financial flows and on prospective partners, including a blacklist to help quality control of intermediary NGOs, contractors, suppliers and beneficiaries/promoters);
- evaluation (access to general information on microprojects, such as location, type, and duration, as well as by microproject phase, and the link between the financial & accounting module and the technical data).

The activities most likely to pose a problem are:

- the link between accounting and microproject monitoring, because it requires the establishment of analytical accounting (hence the design of an analytical code);
- the creation of a blacklist, because it requires establishing performance criteria.

Intermediate structure

An intermediate modular structure integrates additional information for planning and for prioritizing. A module for prioritizing typically takes information from the financial & accounting module and from the module on social fund partners (information on beneficiaries/promoters), and establishes priorities based on socio-economic and budget criteria (e.g., by assigning a weight to specific socio-economic groups or geographic areas, and by setting aside a certain budget share for each category). A geographic information system (GIS) module may also help planning and prioritizing. Examples of prioritization modules are given in Box 2

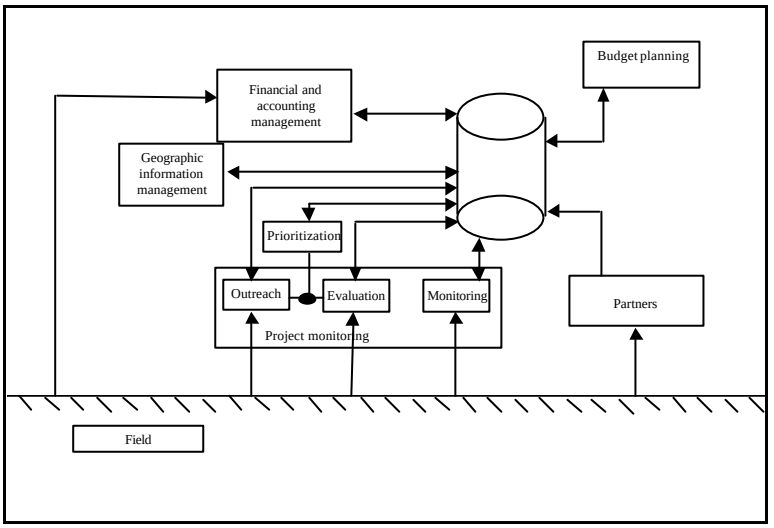


Figure 4 - Intermediate modular structure

An intermediate structure facilitates decision-making and actions in the following areas:

- the selection of proposals for appraisal;
- the decision to finance, because information on budgets supplies supplementary criteria for decision-making;
- budget preparation, because financial allocations may be made according to criteria including technical (implementation results), geographic (GIS), or socio-economic (module on partners) factors;

Box 2 - Prioritization systems in Peru and Haiti

In Foncodes (Peru Social Fund) each proposal presented by a village committee is registered in the system by an evaluator in the regional unit. A module (based on software called Elektra 3) calculates for each proposal a value based on socio-economic criteria as well as investment per beneficiary. A prioritization of the proposal is thus made on the basis of the calculated values.

In Haiti, a similar process is applied on a monthly basis in order to identify the proposals to be evaluated for the coming month. This automatic prioritization is based on two main criteria: (i) a ratio, computed for each community between the amount that has not yet been committed and the amount initially allocated (the latter being determined at the beginning of each year on socio-economic criteria), (ii) the category of the subproject (5 categories from high priority to non priority); the category is determined by the board of the Social Fund and depends on its strategy (priority sectors, emergency situation...).

These automatic prioritization modules prove to be very helpful for the management of the Social Fund. They contribute to making the prioritization process less arbitrary, and thus more acceptable to the beneficiaries.

The activities most likely to pose a problem are the following:

- the link between geographic information and other types of information, because, among other things, a decision has to be taken on the level of geographic analysis needed (regional, departmental, community) and the type of geographic information that is relevant (boundaries, roads or travel time, altitude {correlated with poverty in Armenia}, etc.);
- information necessary for establishing priorities, because the social fund needs to decide the criteria for setting priorities, keeping in mind that the required information must be available. This information must then be accessible via the common database.

Complex structure

A complex modular structure includes modules on administration and the management of contracts. In particular, it allows the integration of information on the management of contracts with information on internal funds management.

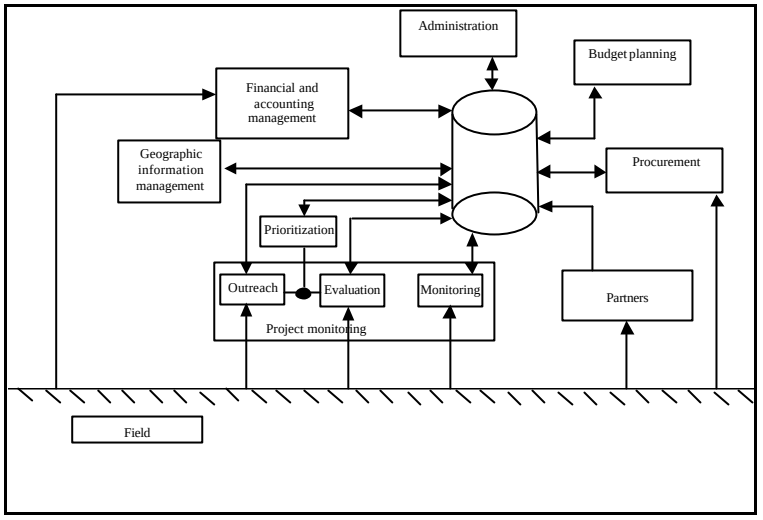


Figure 5 - Complex modular structure

This structure facilitates the following decisions and activities:

- personnel and material management (the operating costs of the agency can be closely followed because of the link between the administrative module and information on microproject monitoring;
- project monitoring and contracts (each contract can be automatically monitored in sync with information on technical progress and disbursement tranches);
- microproject modification (contract amendments and work progress information can be managed simultaneously).

The activities most likely to pose a problem are the following:

- in order to link information on the use of personnel and material to a specific microproject, the administration module must be able to handle analytical codes;
- the management of information relating to contracts requires a subjective choice of what information the project should retain. In particular, when a contract is modified what information on the previous design and budget should be kept?

Network structure

The activities of social funds are usually decentralized, and this needs to be reflected in the MIS. In general, data should be entered into the system as close as possible to the field. Without necessarily going to the extreme of the Peruvian social fund, where consultants in charge of microproject monitoring carry portable software and do data entry on the spot, it is a good idea to carry out data entry at the regional level, or lower. This requires the decentralization of at least the module on microproject monitoring and, as much as possible, the accounting module (although there may be legal constraints to this).

If information is entered at a regional (or lower) level, there needs to be a decision on what information should be transferred to the central level. Transferring all the data to a central level is only justified when it is not possible to put in place at the local level an effective data management system. In any case, it would be rational to filter information in two ways: (a) selecting some data that is sent to the center without modification and (b) calculating aggregate indicators of interest to the center (for example, disbursement rates).

The choice of data transfer techniques needs to be made according to conditions in the country. Transfers can be made through Internet, by email attachments, by sending diskettes and by sending paper documents. The primary criterion should be the reliability of the method chosen. Questions to be asked include: How dependable are the phone lines? How dependable is the mail system? Is there access to Internet? Is there Internet or email support? Internet and email should be preferred where phone lines are dependable and technical assistance in case of malfunctioning is available.

How do I choose a structure appropriate for my needs?

What criteria should guide the choice?

- Budget: the amount available sets an upper limit on the complexity of the system and the degree of integration possible.
- Activities of the social fund: the number and types of components have an impact on the complexity of monitoring.
- Local technical skills available: the degree to which skills are available locally will determine technical choices. In particular, the basic platform chosen should be one with which local technicians are familiar.
- Skills of social fund staff and, if relevant, subcontractors: the sophistication of the system should be in line with the competence of social fund staff, and in particular with their computer skills.
- The number and type of donors: this is important for the financial & accounting module, particularly in terms of its ability to produce the required reports automatically. An effort should also be made early on to define reporting requirements for the technical reports, since these are not as standardized as financial reports. It is also important to try to harmonize the requirements of the different donors.
- Local communication networks: their conditions determine the options available for data transfer.

Degree of decentralization: the number of social fund branches and their relative autonomy influence choices related to the network structure and procedures for data transfer.

CHAPTER 3

How will the MIS be designed, developed and put in place?

QUESTIONS THAT THE CHAPTER WILL ANSWER:

Who will do what and when? What does it take to design an MIS and who should do it? What does it take to develop and set up required software, and who should do it? Is it better to start from scratch or to adapt an existing system? How can I ensure appropriate monitoring of the whole process? What does it take to make sure that the system actually works? How should maintenance be organized? How much does it cost?

Who will do what and when? A summary

The table below summarizes the main activities needed to set-up an MIS. These activities are related to stages in the typical World Bank project cycle. Whether or not the suggested timing in relation to the World Bank project cycle is kept, the sequence of activities should stay the same. The bottom line is that you need to plan ahead, start early, and keep in mind that the whole process will probably take longer than planned (as we all know, generally when something can go wrong, it will).

As the distinction between design and development may not be evident, here is what we mean:

- **Design** is the conceptual phase, when you determine what information will be needed and in which form, which computerized modules will best satisfy information needs (for both storage and management purposes), how modules relate to each other, which hardware and software should be used, etc.
- **Development** is the drafting phase for the computerized aspects of MIS, when designs materialize into programs and procedures written for each module and for communicating between modules. The development phase ends with installation, meaning that computers will have been equipped with all software needed for managing information and staff is trained to use it.

Key factors for a successful MIS are the precision of the design and the consistency between design and development. While in principle having the same specialist in charge of both design and development would be a guarantee of consistency, it is better not to do it because there may be a conflict of interest. In fact, it would be tempting for designers to recommend software packages for which they have copyright or distribution rights, or to design an unnecessarily complicated system to keep them busy (and employed!) for a long time with development. Therefore it is best to rely on different specialists, with the designer supervising the developer to ensure that the system is faithful to the design (see Annexes 2 and 3 for sample terms of reference for both designer and developer).

Table 1– Who will do what and when ?

When?	What?	How Long?	Who?
Preparation	Review draft operations manual	1 week	Designer
Appraisal	Design MIS	2-4 months	Designer
	Start developing MIS (programming)	2-4 months[5] or 6-10 months[6]	Developer
	Monitor development	2-6 weeks	Designer
Implementation Before 1st application	Installation	Main office 2-5 weeks, regional offices 15 weeks	Developer
	Training	1 week in 4 month period	Developer (+ staff MIS specialist)
Once a year & mid-term review	Monitoring	1 week	Designer or MIS specialist
Supervision Mission	Checklist monitoring		Mission members
New project/ extension ***Appraisal***	Redesign/review	2-4 months[1] 6-10 months[2]	Designer

Even with the best luck and the wisest planning, arriving at the right MIS for your social fund tends to be a long and iterative process (see Box 3), and the timing suggested in the table should be interpreted as an average time to arrive at an initial version. In particular, piloting, testing and training may take extra time and delays should not be surprising. A good social fund adapts itself to changing conditions and

Box 3 - MIS evolution in the Bolivian social fund

In 1987, a first module was developed to monitor the microprojects under implementation. In 1988, two other modules were developed independently: one for appraising proposals (based on a base-costs database and on a mechanism to prepare budgets) and the other for accounting. After a while, and despite two upgrades of the software, it appeared that the three independent modules could not manage the information properly: there were many problems in data transfer and the processing was far too slow.

In 1989 a new upgrade was prepared. After two years, work was eventually complete but because of the lack of maintenance from the local supplier, only the upgrade of the module for microproject monitoring proved to be operational.

In 1995, it was decided to start from scratch a new system that would include seven integrated modules linked to a common database. At the end of 1996, the local external consultant in charge of developing the software decided to break the contract, arguing that the terms of reference were not precise enough and that the costs were underestimated. Not only was the product far from complete, but it was delivered without any operating manual.

In early 1997, it was decided to resume development of the software internally after having trained the MIS staff. A new design phase was needed because of the lack of documentation and lasted 12 months. The software is not yet fully finalized.

[5] If adapted from a similar MIS

[6] If new, complete MIS

priorities, and the MIS has to keep up. Thus, it has been common for social funds to review, and sometimes re-engineer, their MIS as the pace of activities picked up, new components were added (or old ones dropped) and more efficient procedures were adopted. In addition, technological change is fast, and technical upgrades are highly desirable.

What does it take to design an MIS and who should do it?

It sounds obvious, but it bears saying: the success of an MIS depends on the quality of its design. If the basic design is good, subsequent modifications will be relatively easy and development straightforward. Initial design should start to take shape before the appraisal stage of a project and should be completed by effectiveness. The detailed design should start when the procedures and indicators for the project are being prepared, since the MIS needs to be an integral part of the operating procedures. Failure to do so is likely to slow down project operation while the MIS and the operating procedures are being adjusted to each other and staff learn and re-learn the system.

A local MIS consultant (if available), or an international one, should be recruited to design the MIS and oversee its development. In addition to being technically well versed, the consultant should have experience with similar systems designed for development projects and preferably for social funds. He/she will need to understand the needs of the funding agencies, the government and especially of the social fund staff (sample terms of reference are in Annex 2).

The consultant should:

- assess the detailed information management and computerization needs of the social fund (by component, by hierarchical level and by function, without forgetting donors and government);
- design a system that will be fully integrated with the operating processes of the social fund;
- draft detailed terms of reference for the developer (who will be different from the designer);
- supervise the development phase of the MIS;
- approve, together with social fund management (and eventually the financing agency), the product delivered by the developer.

In addition, the design consultant should participate in supervision missions to ensure that the MIS is working well and adjusting to any changes in the operation of the project.

The consultant should work closely with the social fund staff to identify their information needs, and in particular with managers to ensure that the MIS is an effective management tool. For the microproject monitoring module, the designer should focus on integrating the MIS into the microproject life cycle (proposal, appraisal, selection, contracting, monitoring...) to provide management and staff with the appropriate tools for information management and decision-making, including performance and outcome indicators. The design should be flexible enough to adapt to changes in procedures during the project.

Before starting the development stage, in other words, before signing a contract with an information technology specialist, you need to be sure that the designer has provided the following:

- a diagnostic of project management information needs: what information, for whom and to do what?
- a detailed description of a set of modules including their functions, their information input and output, and their intended users;
- the design of the system structure, including the modular set-up, links between modules, and the content of the common database;
- technical specifications of the equipment;

- list of indicators for monitoring performance and impact (see Technical Box 3);
- draft data collection sheets, prototype standard reports and summary tables;
- an organizational structure with personnel needs for the collection, input and processing of data, and supervision of the MIS;
- detailed terms of reference for the development and installation of the system.

Documentation should be updated as the system changes, otherwise it will be very time consuming for any designer, developer or technician to work on the system, be it for maintenance, repair, trouble-shooting or improvement.

Technical Box 3 - Defining indicators

One of the main problems with indicators is that they often have to express qualitative data (for example, a judgement on performance or impact) in quantitative terms, which are restrictive. Keeping in mind this fundamental dilemma, operational indicators should be:

- *sensitive:* a variation in performance should correspond to a variation in the value of the indicator, and vice versa,
- *specific:* factors responsible for variations in the value of the indicator must belong to the activity which is being assessed,
- *measurable:* the indicator must be sufficiently explicit and operational so that values can be determined without costly calculations;
- *objectively verifiable:* the value given to the indicator must not depend on the person who measures (this is particularly problematic for performance indicators, and an effort should be made to define objective criteria rather than relying on a subjective scale going from "very bad" to excellent").
- *multiple:* especially when it comes to evaluating the performance or impact of subprojects, it is advisable to use several, complementary indicators.

Below are typical indicators for a social fund.

Performance Indicators

- For each subproject: indicators of technical performance (e.g., implementation rate) and financial performance (e.g., disbursement rate), and their link between the two (e.g., ratio of implementation rate to disbursement rate).
- For each component: indicators of overall technical performance (e.g., average processing and implementation time for subprojects, percentage of subprojects experiencing processing or implementation delays) and financial performance (e.g., average subproject size, average disbursement delay) to enable comparison between different components.
- For each phase in the subproject cycle: indicators of the performance of different phases of the subproject cycle to identify bottlenecks and rationalize work and budget allocation (e.g., average time a subproject spends in a phase).

Impact Indicators:

- For each community: indicators on targeting (e.g., percentage of women beneficiaries, percentage of women in the Project Committee), sustainability (e.g., maintenance and use of the facility 1 year after completion), capacity building (e.g., enrollment rates, additional community-based initiatives), empowerment (e.g., women represented in community associations, requests to authorities), standard of living (e.g., morbidity rates, access to safe water)
- For each objective of the social fund: indicators on aggregate impact (e.g., percentage of infrastructure properly maintained after 1 year, average increase in women's participation). These indicators should be linked to the logical framework.

What does it take to develop and set up the required software, and who should do it?

Once the outputs of the design phase have been approved, they are the reference for the development phase, during which the computerized tool will be prepared by a developer (sample terms of reference are in Annex 3). In choosing someone to develop the software, you should consider:

- the level of complexity of the design,
- the qualifications of the developer, including experience in similar assignments, and
- the sustainability of the system, that is, the need to maintain the system past the development stage, to make any needed changes or additions and provide additional training when required.

The development of the MIS can be done in-house, as in the Egypt, Peru and Yemen Social Funds, or by a private consultant outside the project as in Benin and Zambia. Each alternative has its advantages and disadvantages, as shown in the matrix below.

Table 2– Internal vs. external developer

	PROS:	CONS:
External Developer[7]	• by definition, qualifications will be appropriate • there will be a contract whose conditions must be met (no delivery, no payment)	• possible slow response to needs due to competing assignments • resistance to handing over programming codes • difficulty in understanding daily operation of social fund and limited interaction with users
Internal Developer	• good understanding or knowledge of social fund operations and regular interaction with system users • fast response to new needs • easier software integration with other aspects of information management	• difficulty in finding and retaining competent technical staff (competition from private sector) • competing demands or unequal distribution of work may result in excessive workload and consequent delays

Whether the developer is an outside consultant or social fund staff, detailed terms of reference for the assignment should be prepared by the designer, who will also supervise the work. Also, it is generally best if the developer is located near the social fund headquarters, both for budget reasons (savings on travel, etc.) and to have rapid response when in need of maintenance or upgrades. For example, the Ethiopian social fund uses a consultant living in Kenya, which poses considerable problems when the system malfunctions or needs improvements, especially since the consultant has refused to hand over the programming codes (making it extremely time consuming, if not impossible, for someone else to work on the system).

[7] If a private consultant is chosen, it may be better to opt for a firm rather than an individual, because a firm can provide higher levels of continuity over time and may be better able to manage conflicting work demands.

Is it better to start from scratch or to adapt an existing system?

This question must be answered at two levels.

Technical level

Regarding the software on which the MIS is based, it would definitely be easier (i.e., faster and cheaper) if an off-the-shelf integrated software package for MIS existed. Unfortunately, this is not yet the case, although the technology and the market are not very far from it. For the time being, it is recommended that new social funds see if software used by other social funds would fit their needs or could be adapted to their needs at a relatively low cost (this recommendation is included in the terms of reference in Annex 2 for the design of the MIS).

The modular approach recommended in Chapter 2 helps move in the direction of using off-the-shelf software for some modules. For example, there exist many standard, cost-effective, off-the-shelf accounting software packages.

System level

Even when standard tools exist, it is still essential to assess the specific needs of each social fund, in order not only to identify the appropriate software and to adapt it, but above all to develop procedures that encourage actors to produce and use the appropriate information.

How do I ensure monitoring of software development?

The consultant who designs the system and prepares the terms of reference for developing the computerized MIS should also be responsible for monitoring the process and ensuring an outcome in line with the design. He/she should:

- review periodic progress reports prepared by the developer,
- assist the developer in understanding the requirements when the need arises,
- make any required alterations in the design of the MIS based on changes that are deemed appropriate during the development stage (obviously, changes in the design have to be discussed first with the social fund management).

Progress in the development and implementation process can be assessed using the following questions:

- Is the developer in sufficient contact with the different stakeholders and consulting with them regularly and on critical issues?
- Are the needs of the project well understood and taken into consideration by the developer?
- Does the developer have the competence needed to implement accurately the computerized aspects of the MIS?
- How good is the quality of the documentation being developed for the coding and the user's manual?

What does it take to make sure that system actually works?

Parallel to the development stage, a number of steps need to be taken to ensure that the computerized MIS will be fitted with all the right pieces to make it operational. Prior to making the system available for users, the developer will:

- coordinate with project information technology staff the procurement and set up of all required hardware and software, and establish all the networking and communication links required for the computerized MIS;
- produce a user's manual, including instructions both on procedures and technical aspects;
- coordinate with management the arrangement for the required training (number of sessions, participants, equipment, etc.);
- ensure that all users and operators have the computer skills necessary for operating the system (training courses in computer skills, if required, should be conducted prior to the MIS training sessions);
- when a paper-based system or other software is already in place, develop a transition strategy to the newly developed system minimizing interruptions to the social fund operation.

As soon as these requirements are met and the development and testing of the MIS have been completed, the developer will install the computerized MIS on the available hardware and proceed with the training. Different training sessions may be required for different people depending on skills and level of involvement with the MIS. Testing may require a pilot program to examine some of the critical issues, such as data entry and transfer, communication, and warning systems.

By the end of the developer's contract, the social fund should have a computerized MIS in place, and social fund staff should be able to use it properly. In particular, the output of the development and installation phase should be:

- programming codes for each module and the overall system –these programming codes are the property of the social fund;
- tested software for each module and tested links between modules;
- a detailed user's manual;
- trained staff able to operate and use the system.

How should maintenance be organized?

Maintenance of the MIS will ensure its proper functioning, as well as updating to keep it relevant, efficient and effective. Given the dynamic nature of social funds, systems tend to become obsolete after a few years. Hence, it is important, as part of the design and development planning process, to include a maintenance strategy to regularly monitor MIS relevance and performance. Preferably, such an exercise will be part of an overall information technology and information management strategy for the project.

A maintenance strategy may include the following activities:

- review of information requirements and needs, including reporting needs (Is the information collected and produced useful? Is it used? Is there additional information that should be collected or produced?);
- review of MIS efficiency (Is the software storing and producing information as expected? If not, why not? Does social fund staff have requests or suggestions for improvements?);
- adaptation to procedural changes (Have procedures changed since the MIS was designed? Have components be added or dropped? Have new staff positions been added?)
- upgrade of hardware and software.

Remember: any changes in the MIS must be noted in the appropriate documents (user manual, design report, program coding reports, etc.).

How often should maintenance take place? Ideally, continuously, but not many social funds have the means to do it. That is, have enough money to pay an in-house specialist and a volume of operations that warrants it. On the other hand, calling an MIS consultant only in emergency cases would be a false economy, because often problems cannot be rectified unless major (costly!) changes are introduced. This is why Annex 6 proposes a checklist to be used by non-specialists going on supervision missions to help them make a superficial assessment and determine whether more specialized expertise is needed. It is recommended to go beyond the common practice of reviewing the MIS only at the midterm review, and to recruit a specialist during the early stages of the project to carry out MIS maintenance at least once a year.

How much does it cost?

The cost of an MIS will be determined by two main variables: the complexity of the social fund (size, components, number of donors, level of decentralization) and the complexity of the MIS. The matrix below distinguishes three levels of complexity for social funds, from 1 (e.g., less than US$100 million, no decentralized offices, one or two donors) to 3 (e.g., several decentralized offices, several components, several donors), and three levels of complexity for the MIS, from basic to complex (see Chapter 2). Estimated costs are based on information gathered during the preparation of these guidelines (summer and fall/winter 1998).

Keep in mind that:

- The costs cover all the activities necessary to design, develop and put in place the system. Needless to say, they are purely indicative. While the cost for the simplest basic modular structure is about US$ 20,000-50,000, increasing the sophistication of the system can easily double costs. Experience suggests that the more complex, completely integrated systems require heavy investments in time and money. One way to contain costs is to rely on local expertise, with occasional outside quality control or trouble-shooting as necessary.
- It is always possible to chose a system that can be expanded as needed, starting with the basic structure and evolving as needs grow. However, if one knows from the start, because of the size of the project and the availability of local skills, that a more complex structure will be installed eventually, it is important to plan ahead and take decisions compatible with a more global system, even though the actual implementation of the whole system will be done in a phased way over time.
- The costs do not include the purchase of equipment, or the costs of maintenance. They include the design phase, the development phase and the implementation and training. The percentage of the costs associated with a specific phase can be estimated as follows: 30 % for design, 60 % for development and implementation and 10 % for training. However, they may be different depending on the type of consultants hired (international or local) for design and development. They are also influenced by the complexity of the SF (which would increase the percentage for the design) and the complexity of the MIS (which would increase the percentage for the development). Network aspects would also increase the percentage affected to development.

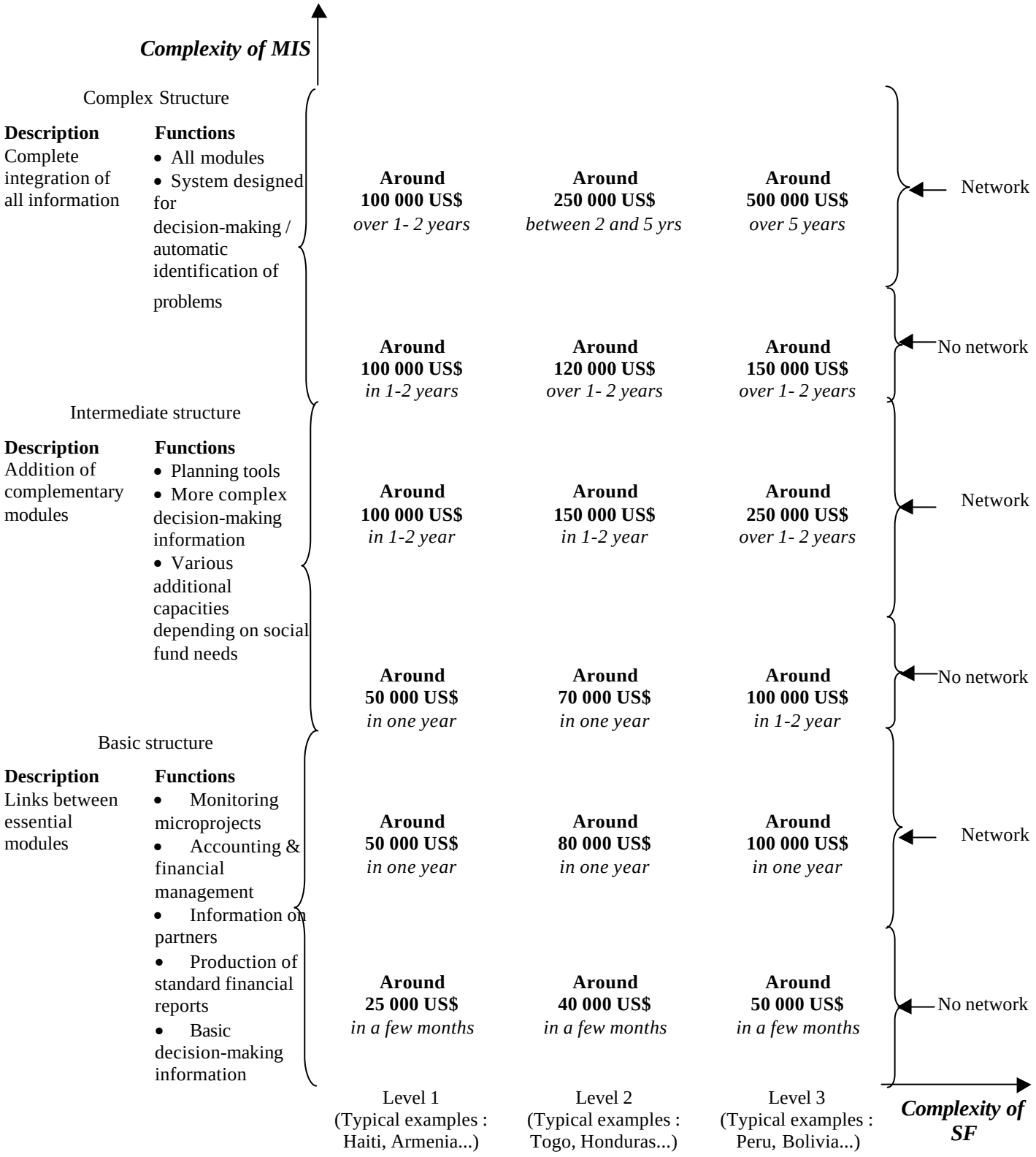


Figure 6 – MIS cost analysis

CHAPTER 4

How will I get the best out of my MIS?

QUESTIONS THAT THE CHAPTER WILL ANSWER:

If my social fund already has an MIS, how can I implement these recommendations? How will I know if the MIS is working well? How can I identify the causes of problems that come up?

If my social fund already has an MIS, how can I implement the recommendations of these guidelines?

These guidelines contain a number of recommendations on the process to follow to set up an MIS and on the desired features of an efficient system. If you are starting from scratch, it should be relatively easy to follow them. But what if your social fund already has an MIS? What if your MIS does not have some of the desired features mentioned in the previous pages? This section is to help you find ways to avoid having to do it all over or being doomed to inefficiency. It follows these seven basic recommendations drawn from the previous chapters:

- the accounting system should be linked with the micro-project monitoring system;
- the MIS tools should be organized modularly;
- to the extent possible, the MIS should adapt to the decentralized organization of the SIF;
- any new project components should be managed by the MIS, in order to prevent the multiplication of management tools;
- the MIS should facilitate the management of impact information;
- MIS tools should facilitate decision making;
- information management should be secure.

1. How to integrate a separate accounting system with a microproject monitoring system

There are two major reasons to have an integrated system (accounting + monitoring):

- to ensure consistency of information about disbursements, avoiding duplicate input and problems resulting from differences between accounting and monitoring data;
- to facilitate the preparation of reports by combining financial and technical data.

<u>You need answers to these questions</u>:

- Does the monitoring system generate data to be used by the accounting system? (for example, some social funds have microproject monitoring modules which process information from the field to produce supporting documents for disbursements).
- What information should be shared by monitoring and accounting modules?
- In which module should shared information be input and updated?

- To what extent are the existing format and structure of the accounting database compatible with the format of the monitoring database (this will strongly influence the quantity of work needed to link the two)?

Solutions:

- The best solution would be to rebuild the system using one database platform and a single database structure. This would be the solution when the different applications are closed (i.e. when exports and imports of data are not easily possible) and/or operate in different places. But it can be costly.
- A second alternative would be the development of computerized auxiliary routines that could periodically check figures in the different data files and display "warning flags" or special "reports". This could be the solution when the social fund manages open database files (i.e. in a format that allows easy exports of data) and the MIS Unit knows the structure of the database. The development of these subroutines can be done by the MIS Unit staff or by external consultants (depending on the complexity of the data model and the capacity of the MIS Unit staff). The limitation of this solution is that it only detects inconsistencies: the data still needs to be input twice.
- A third alternative would be to develop a periodic transfer protocol between the two databases (accounting database and microproject monitoring database). The financial information needed in the microproject monitoring module would be automatically copied from where it was input (i.e. the accounting database)

2. How to transform a compartmentalized MIS into a modular one

The main reason to have a modular system is that it is flexible and can easily adjust to project changes, such as a new component, or new information needs. A modular system should follow the following basic principles:

- Each module should produce a specific set of information
- Each datum or bit of information should be input only once
- Each input should be secured, i.e., can be made only from one module

You need answers to these questions:

- What are the existing functions of the computerized MIS? That is, what can the computerized MIS do?
- How are data in each software package stored (format, structure)?
- What are the existing links between software packages, if any?
- Which data are input more than once through different software packages?
- Which information should be shared by which modules? (This aspect is critical to integrate and restructure the databases)
- Who should input which data and who should have access to which data?

Solutions

As shown in Chapter 2, a modular structure implies a common database: the first thing to do therefore is to restructure the different databases and integrate them into one. Before performing this operation ensure that no data will be lost and more particularly assess how much it will cost to transfer the data from the old databases to the new one.

Only when the database has been securely restructured can the modules be implemented. It is indeed very risky to start developing any new applications or modules before having a clear idea of the way the data should be organized to enable the production of the necessary reports. In the best case, routines can be developed at low cost that will enable the re-use of some of the existing modules; but this may turn out to be false economy. It can be both more cost-effective and technically secure to redevelop some of the modules from scratch.

3. How to go from a centralized to a decentralized system

If the social fund has regional (or lower level) offices, it is essential that the MIS follows a similar structure by being configured as a network. This will make it possible to keep detailed microproject information at the regional level, where it is needed, and only transfer key information to headquarters (e.g., total budget, tranche disbursements and implementation ratio), thus avoiding the need for very large data storage capacity at the central office. More importantly, it will make communication between headquarters and regional offices much more efficient and cheap. The basic condition for a computerized network is the existence of reliable telephone lines.

You need answers to these questions:

- How reliable are telephone lines? If they are not, forget about a computerized network.
- How many decentralized/regional offices does the social fund have or plan to have?
- What is the level of computer literacy in the regional offices? This helps determine the choice of a data transfer mechanism.
- What information technology support is available at the regional level? If little or none, the system should be kept as simple as possible.
- What information should be stored exclusively at the regional office and what should be transferred to the central office?
- What level of autonomy will the regional offices have? If they depend on headquarters for most decisions, data transfer has to be frequent and fast.

Solutions:

- The ideal solution is to have an "on-line" connection between regional offices and headquarters, meaning that data input at the regional level is automatically accessible in headquarters (or in other regional offices if desired) through Internet. This option is only advisable if telephone lines are reliable (i.e. do not break down too often and are not obstructed by the flow of communications) and not costly (otherwise access to data will take more time than you have patience) and regional level staff are familiar with computers.
- The second best solution to batch data, meaning that a subroutine is designed whereby certain data are automatically transferred to the central office at off-hours (e.g., between 2 and 4 a.m.). This option is advisable when telephone lines are reliable and not too costly. Once the data have been batched they can be accessed off-line.[8]
- The last solution is to rely on email for day-to-day communication and to transfer data either as email attachments (if not too cumbersome) or by diskette. This option is advisable when telephone-based solutions are not reliable. (i.e. in most cases...)

[8] For those who use Lotus-Notes Mobile, the difference between the first two options is the same as that between accessing your email on-line (1st solution) versus by replicating the database (2nd solution)

4. How to insert procedures and data for a new component into an existing MIS.

The main challenge when adding a new component is to ensure a good fit (interface) with the existing MIS. Data coding should be consistent and relevant data should be exchanged with other parts of the system. For example, whether you use an existing monitoring software package or whether you introduce a new module, there should be a link with accounting data.

You need answers to these questions:

- What information will be needed for the new component?
- What information needed by the new component is already available through the MIS?
- Who are the users of the information for the new component, existing staff or new staff? If existing staff, you should try to keep procedures as similar as possible to existing ones.

Solutions

- There are two possibilities: (a) to add procedures and data for the new component to existing software, or (b) if there is not enough common ground with pre-existing components, to insert a totally new module.
- When procedures for a new component are added to existing software, the MIS Unit (or an outside consultant) should analyze the existing structure of the database, the new data to be incorporated, and the appropriate links between the tables (i.e. categories of data) of the database. This tends to be the cheapest alternative of the two, but its feasibility will depend on the nature of the new component (the more different from old components, the less feasible) and on the design of the existing monitoring software. When the existing subproject monitoring software and the database are old, not well designed and badly documented, this solution will be hardly feasible: in some cases even the programming code is not accessible which blocks any attempt to use this solution.
- When procedures and data for the new component cannot be incorporated into the existing software, a new module should be designed. In that case there should at least be some routines that allow export and import of data in order to (i) get accounting data from the accounting database and (ii) export data on the technical progress to make it possible to consolidate with data from other components.

5. How to use an MIS to handle impact indicators

Many social funds carry out monitoring primarily with information on (a) specific outputs (e.g., number of new water systems, number of repaired schools, etc.), (b) disbursements (e.g., percentage of total microproject budget disbursed), and (c) performance (e.g., days in the appraisal phase per microproject, number of microprojects per supervisor, etc.). Impact indicators are seldom clearly defined, and tend to be confused with output or performance indicators. To find out the impact of their work, most social funds commission studies by outside consultants, and no effort is made to integrate the results of such studies in the MIS. The fact that impact indicators are often qualitative is an additional obstacle to integration.

A few SFs (e.g.: SNC Colombia) work with methodologies that take into account impact indicators during microproject design and implementation. These institutions apply a logical-framework methodology to plan their operational strategies. The MIS of these institutions handle information on impact indicators in a systematic way, using a database of common impact indicators. Each microproject uses these impact indicators in its "mini" logical-framework and each indicator has "baseline data", "goal data" and "evaluation data". The "mini" logical framework is related to the Program logical framework allowing the MIS to produce individual and global impact reports.

You need answers to these questions:

- Are the types of impact indicators needed "macro" (that is, related to the social fund as a whole, such as the impact of the social fund on government/NGOs relations) or "micro" (that is, related to an individual microproject)?
- Does the social fund plan its activities using a logical framework approach? Is planning for individual microprojects done using a logical framework? If yes, impact indicators should be already identified.
- Have impact indicators been defined (see Technical Box 3)?
- Who will collect them, how and how often? If the Operating Manual does not have this information, it will need to be added.
- How knowledgeable is the social fund staff about impact indicators -- their meaning, formulas, analyzing methodology, frequency of measurement and evaluation, etc.? Training may be needed.
- Has the MIS database structure been designed to make it possible to handle impact indicators (in particular, there should be a specific table for impact indicators in the database)?

Solutions

- The preliminary step is to determine whether the existing software and databases are open and allow adjustments. If not, a separate application or module may need to be developed.
- Probably the best approach is to adopt a logical framework methodology for planning, both at the global and at the microproject level, because the logical framework requires that measurable impact indicators be identified at the planning stage. If this is done systematically, as in the Colombia social fund, a database of common impact indicators can be included in the MIS and used routinely for each microproject in its "mini" logical framework.

6. How to have automatic "alarm bells " for both data quality control and microproject monitoring.

The two most common ways to produce "alarm bells" are: (a) a comparison of simple data with pre-established parameters which produces a warning when discrepancies go beyond pre-established limits (for example, entering a tranche disbursement larger than the total microproject budget); (b) a combination of processed information which gives a warning. There are no standard "alarm bells" or specific formulas to design them. The best way is to use common sense and to learn from others.

You need answers to these questions:

- What are the critical points for data quality control (e.g., consistency between accounting and monitoring data)?
- What are the critical points for microproject monitoring (e.g., field visits, tranche disbursements)?
- Which "alarm bells" could be useful for overall social fund management (e.g., black list of suppliers or consultants, low levels in the special account)?
- Who will see the "alarm bells" and who will have responsibility to take action?

Solutions

- In compartmentalized MIS, the "alarm bells" could be generated using information from reports or screen data, in which case you need to identify which outputs are more likely to be incoherent and submit them to specific tests. As the tests only apply to the results of calculation or data processing in reports produced by different applications with are not linked, it is difficult to identify the causes of the problems. However such tests are easy to implement and as they are limited to the detection of problems do not require an in-depth analysis. In modular MIS, when the MIS unit has the program source codes, the "alarm bells" can be generated as part of special

computerized routines. “Alarm bell” interpretation could be supported by user guides or (better!) by computerized “on line” messages. In that case, it is possible to go as far as the identification of the specific data that cause the problems. This however requires an in-depth analysis in order to identify a-priori where the discrepancies are more likely to occur.

- For data quality control, some MIS validate “on line” the information that a user is inputting at a working station. Examples include: (a) comparing the date for an implementation stage with a previous one (e.g., appraisal date could not be earlier than the proposal registration date); (b) having to use specific words to describe a microproject (e.g., in Colombia intermediaries start the description of a microproject using a verb to stress action); (c) inputting figures within a specific range (e.g., the cost of a microproject has to be US$5,000-200,000). In order to implement such controls, you need to know what the common input errors are likely to be. The designer who prepares such controls will therefore need to be familiar with the existing MIS.
- For monitoring microproject appraisal, it is common to use “alarm bell” related to cost effectiveness indicators, such as cost per unit of microproject (e.g., cost per square meter of new construction or rehabilitation, cost per linear meter of pipeline or road, cost per person per training day). The social fund prepares tables containing an ideal range of parameters against which to compare the real parameters of a microproject.
- For microproject implementation monitoring, “alarm bells” tend to be used to flag discrepancies between planned and actual implementation schedules. Such alarm bells are not only quality control features. They can also serve as real performance indicators, helping to detect automatically problems on subprojects. For example, dividing the disbursement rate (disbursed amount as % of the total cost) in a subproject by a performance indicator showing the progress of the subproject (time spent, using actual date, starting date and duration, or even better % of work accomplished) , the MIS could calculate an indicator (usually called “delay ratio”) that shows if somehow the disbursement rate is correlated to the physical progress. Over a certain value this indicator could be used to automatically identify subprojects where money is being spent while no physical results are observed.

7. How to add security features to an MIS

The two most common types of security features are hardware security and software security. The latter includes “access & privileges” security and “audit” security.

- Hardware security has to do with the operating system. To operate a workstation, the user should use a password. To enter the Intranet, the user should also use a password. This type of security is common and independent of any computerized application. Operating systems like Windows 98, Windows NT and others provide it and the MIS Unit administrator could easily set up this feature.
- The software “access & privileges” security features are related directly to the software application. Normally, an MIS application would have a predefined matrix of types of users and “privileges”. According to their position, users can have access to specific screens, queries or reports to consult them, insert new data, or change existing data (including deleting them). These features must be part of the software.
- The software “audit” security feature is a “post-operation” tool. In sophisticated MIS, an “internal event recorder” is installed and each movement that involves a change of data is recorded in a specific file. All changes are identified by the code of the user who performs the action. Periodically, an MIS auditor or a manager can review the file.

<u>You need answers to these questions</u>:

- Do the social fund and/or the Bank want to have “access” and/or “audit” security features?

- Who should have access to which information?
- Who should be able to input or manipulate which information?

Solutions

- The hardware security features are very simple to apply. The MIS Unit administrator (or a technician) uses the existing features of the operating systems and sets up a table of users with passwords.
- Most database platforms already have "access & privileges" security features. The MIS Unit administrator only has to prepare and manage the users /privileges matrix. When the software platform does not contain such tools, specific computerized routines have to be designed and put into the MIS source programs. This can be very costly both because of the time spent in developing the routines, and because of the time spent to test them. It is therefore recommended to use a software platform that is standard and includes such features.
- The software "audit" security feature is more complex and in any case specific computerized routines will have to be designed for the MIS source programs.

Trouble shooting: How will I know if the MIS is working well?

The best indicator of a well functioning MIS is that the information it provides is effectively utilized. The MIS should be assessed regularly; meaning that each supervision mission should carry out at least a summary evaluation. A sample evaluation questionnaire to help task managers is in Annex 6. In a more general way, the following questions should help determine how the MIS is utilized.

Who uses the information provided by the MIS?

The MIS is used at two levels: for the day-to-day management of information and for decision-making. It is important to ensure that each person is using the information according to his or her specific needs. It is particularly important to be attentive to this issue in social funds because often staff recruited as technicians (engineers, sociologists) or even managers lack computer skills. The MIS should become the indispensable working tool of the social fund, as in Armenia case (see Box 4). The principal sign that the MIS is being effectively used by each person in the system is that it becomes a major channel of communication within the social fund. In practice this means that, for example, the analytical codes are used and understood by everyone, reports requested by managers and external partners are produced directly by the computer, and especially that information is transferred from one unit to the other using the system.

Box 4 - Armenia - Good practice for MIS use

The Armenia social fund is characterized by an effective use of the MIS at all levels of the system (this may be partly due to the fact that most of the managers are former scientists who have a special interest in computer technology). The most remarkable aspect of the system is how the people who are recruited to appraise and monitor microprojects (mostly engineers) come to rely on the MIS for their work. Most of these people before being recruited were completely ignorant of information technology. Initial contracts were temporary and new recruits were given a month of training in office technology. Performance during this training was an important factor in giving permanent contracts with the social fund. At present, they themselves enter the data they have collected while they are still in the field and they consider the MIS an indispensable tool for doing their job well. As one of the technicians put it, "Before being recruited I didn't even know what a computer was. Now I can't conceive of working without the project monitoring software".

How useful (and used) is the MIS?

To check the usefulness of the MIS, you need to determine if it increases productivity and improves communication. To do this, it is helpful to refer to three indicators:

- the amount of additional work that must be done to make the information taken

directly from the MIS operational; (for example, if it is important to know how much time it takes to evaluate a proposal, do I have to calculate it by listing the time taken for each proposal, or does the software calculate it for me; or how much time do accountants spend reformatting the system reports to meet donor requirement?);

- the degree of confidence the actors have in the outputs of the system (in many cases MIS users would not pay much attention to a low % of technical progress, arguing that it does not reflect the problems encountered in the field; they would need to read some qualitative comments on the value of the indicator to be comfortable in using it);
- the persistence of parallel procedures, such as using a different accounting system when one is already provided by the MIS or duplicating information transfers by sending hard copies of documents already sent electronically. This can be an indication of improper training or an indication that the MIS itself is not well adapted to the work of the social fund.

Is information easily accessible?

One of the fundamental criteria of a well functioning MIS is that information is easily accessible. To check, you can ask people at different levels of the social fund to do the following: (i) produce a report, (ii) provide information on the cost of a specific microproject, (iii) produce a list of problem microprojects, (iv) identify the cause of the problem in a specific microproject. If information is difficult to get, you may find that the person you ask will ask someone more specialized in MIS aspects (e.g., the MIS technician) to produce the information, or will say it is possible to provide the information but will only provide it after considerable work. The reason could be poor training or a problematic interface, that is, insufficient coordination between different software programs.

Is the information relevant and of good quality?

The first indicator of quality and relevance, is the degree of confidence the personnel have in the information that is produced by the system. Sometimes this information is not used because it is considered "useless" or incorrect. For example, MIS in social funds often use the average time a dossier spends with a particular technician as a performance indicator for that person. However, managers may consider this irrelevant because of the many possible explanations unrelated to performance. Likewise, information on dates is often regarded as suspect because the date of data entry tends to be confused with the date of data collection or the date on which the activity recorded actually took place. A possible quality check consists of consistency checks between information provided by different modules of the system, particularly those with financial and temporal data.

How can I identify the causes of problems that come up?

Once a problem has been identified, it is possible to isolate its cause by reviewing each stage of the information management process: data collection, entry, cleaning and output. Logically, the problems found in one stage will be caused by problems in an earlier phase, which is why it is recommended to analyze the process in reverse.

Outputs. At this level there are several critical points:

- Is the format of the information that comes out appropriate for the required uses? Sometimes, for example, the accounting software is only partially used because the formats of the reports produced by the software do not correspond or only poorly correspond with donor requirements in terms of withdrawal applications

- Can you customize outputs? A system may not be used if it only produces certain predefined tables. It would be more useful to tailor outputs as needed (frequency of activities, type of indicators, etc.).
- Do the outputs provide the summary information you need? Having a summary table that provides the required information on a microproject, a component or a region is important. If information cannot be extracted from the system in a useful form, data entry will be done carelessly and quality will suffer.

Data Entry. Problems with data entry may be related to the following:

- Who does data entry? Problems may arise when this task is the responsibility of a separate data entry group, because this adds an extra step (the person who collected the information must transmit it in a specific format to the person in charge of inputting it), with the risk that the data entry person will misread the information. It is better to assign data entry to a person who will use the information and who will therefore be more concerned with the quality of data entry.
- Who monitors data entry? If the managers of each component do not monitor data entry, this quickly gives the impression that accurate data entry is not important (or at least not controlled) and quality will suffer.
- What is done with information that is not entered electronically? This is a major issue. One common problem is the poor storage of qualitative data, in particular qualitative information contained in reports that are not, or only partially, entered into the system. There are frequently no links between the electronic database and information that is not computerized. It is important to remember that the information system includes more than information that is electronically stored. For example, studies on the socio-economic profile of communities and target groups or on the impact of microprojects are key inputs in deciding how to organize an information campaign or whether to continue assistance in a particular village.
- When is data entered? The delay between data collection and data entry can lead to important losses in the quality of information, so it is important to verify that data is entered as early as possible after collection, which generally means as close to the field as possible.

Data Collection. Data collection affects information management at two levels: the relevance of the information collected and the adaptation of the data collection instruments. These two factors will determine the efficiency with which data is entered.

- Collecting irrelevant information hampers information management either by requiring systematic screening of all information to determine if it should be entered, or, if all collected information is entered, by using limited data entry time and system memory. For each piece of data, there must be a clear justification for why it is being collected; failing which data should not be entered –even if it "seems interesting". As the world is full of information collected at great cost and never used, the guiding principle should be that of "optimal ignorance".
- Data collection instruments (especially data collection forms such as microproject identification sheets or follow-up forms) must identify clearly in which form information is to be collected (e.g., units of measure, scales, level of detail), and which of the information collected is to be entered into the system. If the majority of the information collected is not entered into the system, chances are some of it is not relevant.

CHAPTER 5

What should I remember if I forget everything else?

A typical problem when reading guidelines is that readers find themselves at the end with the clear idea that there are plenty of things that should be avoided and plenty of things that should be done, but cannot remember any of them exactly. And should they be lucky enough to remember them when they finish the document, chances are that they will be forgotten within a few days. This chapter will help you, if you: (a) fell asleep while reading –technical stuff is known to do that at times, (b) forgot to use a highlighter while reading, or (c) skipped the whole thing and came straight to the last chapter because you cannot bear reading technical guidelines.

1. **Take time for needs assessment**
⇒ Start by finding out the information needed by all stakeholders (content, form and timing), and do it as early as possible

2. **Don't reinvent the wheel**
⇒ Do your homework, find out what other social funds are doing, learn from their experience

3. **Keep it simple**
⇒ No information should be entered twice, all information should be useful and used.

4. **Make it modular**
⇒ Different elements of the MIS should be linked and share information, especially the accounting system and the micro-project monitoring system.

5. **Be (almost) ready when the project starts**
⇒ Plan ahead, otherwise catching up will be difficult and costly.

6. **Be careful with transitions**
⇒ Have design and development done by different people to avoid conflicts of interest; ensure continuity and phasing.

7. **Take maintenance seriously**
⇒ Evaluate the system once a year, make sure maintenance can be done locally, select technology appropriate to the context.

8. **Be flexible, evolve with the project**
⇒ If you change one of the four MIS elements, the others have to change too; if you add components to the social fund, add components to the MIS.

ANNEX 1

Glossary

Analytical Accounting/ Analytical code	An accounting system where every expense is linked via a code to a specific activity. This makes all cost information related to a particular activity easily accessible.
Auxiliary routines/subroutines	Computer programs designed to perform a specific function (e.g., check for data entry errors).
Batch data	To send data from one computer to another at pre-specified intervals (e.g., every day between 2 and 4 am).
Blacklist	List containing the names of people or firms who have not performed satisfactorily and should therefore be avoided in future business.
Chart of accounts	A list of pre-identified types of transactions which will possibly occur. These are grouped and numbered according to their classification: assets, liabilities, capital, income, or expenses.
Client-server architecture	A set-up in which one computer can get information from another. The client is the computer that asks for access to data, software, or services. The server, which can be anything from a personal computer to a mainframe, supplies the requested data or services for the client.
Data	Information organized for analysis.
Data format	The way in which data is recorded and displayed or, more specifically, the way values of a variable are represented to the computer and displayed (e.g., words or numbers, actual figure or percentage, in a matrix or a list, etc.).
Data structure	The way in which data is organized.
Database/common database	Organized set of data, generally computerized. A common database is a database that can be shared by different computer modules or software programs (e.g., information on subproject disbursement can be shared by the accounting and the subproject monitoring modules).
Database platform	The underlying hardware or software for a system. The platform defines a standard around which a system can be developed. Once the platform has been defined, software developers can produce appropriate software and managers can purchase appropriate hardware and applications.
Database structure	The way in which the database is organized.
Design stage	Stage at which the structure of the MIS is determined (e.g., number of modules, connections between modules, etc.). The MIS design is like a blueprint.
Designer	Person or firm in charge of the MIS design stage.
Development stage	Stage at which the MIS is set up in accordance with the design (e.g., software for different modules is designed and installed, connections between modules

are established).

Developer Person or firm in charge of the MIS development stage.

GIS Geographic Information System: A computer system that has maps and geographic information, and sometimes analyses of geographic data.

Import data To bring data into a particular module or MIS from an outside source.

Export data To send data from a particular module or MIS to an outside source.

Installation stage Stage at which the computerized MIS is physically set-up (e.g., installing and testing software programs, connecting computers with cables, etc.). It is often considered the last step of MIS development.

Interface Something that connects two parts of the MIS. For example, a user interface is the part of a program that connects the computer with a user. There are also interfaces between programs, between devices and to connect programs to devices.

Interface, graphic Graphic interfaces use icons and pop-up menus to help users navigate through the system.

LACI Loan Administration Change Initiative: an integrated project monitoring system being introduced by the World Bank bringing together project financial management, disbursement, procurement, contract management and physical progress.

MIS Management Information System: a system with information for management. It includes actors, data, procedures and tools.

Modular structure MIS structure in which different functions of the system are managed by distinct modules. Integration is done through information sharing via a common central database.

Modules Computer programs dealing with a specific aspect of the MIS (e.g., accounting module, monitoring module, etc.).

Network Set of inter-connected computers

Processing routines Pre-established procedures that automatically process data.

Programming codes The building blocks of the computer software. Knowledge of the codes is necessary for modifying the system.

Relational database A database in the form of tables which have rows and columns to show the relationships between items, and in which information can be cross-referenced between two or more tables.

Security "Access and privileges": a security feature which limits the ability to see ("access"), enter and change ("privileges") data to certain authorized staff (e.g., accounting data can only be entered and changed by accountants). Most MIS will have a defined matrix of users and the types of information and screens to which they are allowed access.

"Audit": a security feature whereby all changes in data are linked automatically via a code to the person who made the changes. This makes it possible to determine how often a person updates data or who is responsible for

	a particular data change.
	“Hardware”: a security feature that requires a password to operate a workstation.
Source programs	The primary programming in a software package.
Transfer protocol	A set of rules that regulate the way data is transmitted between computers
User-friendly	Easy to use and understand.
Workstations	Desktop computers.

ANNEX 2

Terms of reference: Design of a management information system (MIS) in a social fund (SF)

Introduction

The task manager should prepare the first part of the introduction. It should provide the context of the management information system within the social fund project, mentioning at least the following elements: (i) general information (country, geographic scope, effectiveness period, amount, donors), (ii) institutional actors involved (national unit, regional units, if any), including an organization chart, (iii) description of the components

The design of the management information system should include a computerized tool, a set of procedures and a list of actors with their roles. The system will be integrated; through a single interface it will manage and give access to information useful for running the social investment fund (accounting, financial, technical, procurement, budget, planning information, information about project partners, and geographic and socio-economic information).

Expected results

The expected results of the design are the following

- review of the project operating manual and suggestions for improvements;
- detailed terms of reference for the development and installation of the computerized management information system;
- evaluation of the consultant chosen for developing and installing the management information system;
- a detailed description of the database structure, with descriptions of all tables and their links;
- examples and templates for all the forms, reports, and summary-tables to be produced by the system;
- a detailed description of the information flows in the social fund;
- a list of the system users and a detailed description of their information needs;
- an estimated schedule for the development and installation of the management information system, with a budget;
- technical specifications for the required equipment and software;
- detailed description of the communication network on which the system will rely (specifications for intranet and communication between regional offices and national office);
- a more detailed work plan for development and implementation;
- a report on development progress every two weeks to the task manager and to the coordination unit;

- review of the tools once the development and implementation are completed.

In general, the last three points correspond to a different contract because the time between the end of design and starting development can be substantial. It is recommended that the person in charge of the design starts very early in the preparation phase. It is also recommended, as long as the design consultant proves satisfactory, that he/she be in charge of the supervising development.

Description of the work

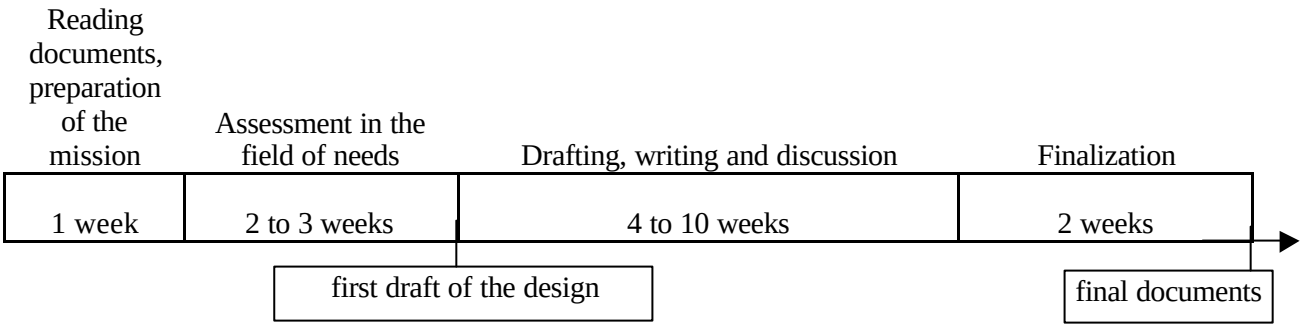
The preceding activities require a continuous and in-depth process of consultation with local actors. In particular, the consultant is expected to do the following tasks:

- identification of and discussion with all actors involved in the project: staff of the social fund (at all levels in the hierarchy), donors involved in the project, local government representatives involved in the project, in particular counterparts in the ministry of planning and in the ministry of finance;
- assessment of the local technical capacity;
- in-depth reading of the project documentation and in particular the operating manuals;
- research on similar existing systems, if necessary;
- analysis of specific requirements for information, reports and summary-tables;
- production of a first draft design of the system;
- discussion of the first draft with all the actors described above to adjust and refine the design;
- final design documents.

Time-table

The required work should take from 8 to 12 weeks, depending on the complexity of the system. Two weeks at least should be spent in the project implementation area and in direct contact with the social fund actors.

The timetable, with expected results, is the following:



Qualifications

The candidate should have the following:

- masters in computer sciences;
- masters in systems engineering;
- proven experience of at least 5 years in relational database design;
- extensive experience in client-server architecture ;
- knowledge of standard administrative tools;
- excellent communication skills;
- ability to work in teams.

The following qualifications are not compulsory but strongly recommended:
- experience in the design and implementation of networks;
- in-depth knowledge of management information systems in social fund projects.

(if, for some reason, no appropriate consultants can be found with experience in MIS for SFs, a visit to other SFs should be planned in order to learn from what has already been done; at least one person from the SF should be involved in this visit)

ANNEX 3

Terms of reference: Development and implementation of a Management Information System

The consultant in charge of system design should prepare these terms of reference. However, in order to help the task manager in assessing the quality of these terms of reference, the following is a list of points that the terms of reference should include.

Specification of the Management Information System

These specifications should be prioritized (see chapter 2):

Minimum specifications:

- Financial and accounting management of (i) the social fund's internal activities, in particular to ensure its compatibility with international accounting standards, and (ii) the microprojects funded by the social fund;
- Monitoring and evaluation of the microprojects funded by the social fund: this monitoring should encompass the whole project cycle from outreach to the end of the contract;
- Storage of and access to all useful information related to regular partners of the Fund (local communities, consultants, ...);
- Easy and quick reading of information through summary tables;
- Advanced specifications;
- Transparent mechanism for microproject selection;
- Detailed monitoring of procurement and contracts related to microprojects;
- Planning of the social fund's activities and budget allocation according to specific objectives;
- Geographic representation of information related to microprojects.

The computerized system should be developed with close reference to the project operating manual and should support the implementation of the procedures described in the manual.

Structure of the system

The system should be computerized and should be compatible with PCs. The minimum requirements in terms of equipment necessary for installation and running of the computerized part of the management system should be described.

The system should be adapted from existing software in order to be simple and user-friendly. It should be compatible with standard office tools (word processing and spreadsheets).

The structure of the system should be modular. The coherence of the information managed by the different modules will be ensured by a single central relational database to which they will have access.

Expected results

- Provision of the software package necessary to run the whole system, in xxx copies. The software will be documented and will have an on-line help device;
- Provision of paper documentation in xxx copies;
- Installation of the system in the national unit and if applicable in the regional units, and training of the users (at least 2 people per unit).

The products will be in ... (specify the language)

ANNEX 4

Terms of reference: Management Information System (MIS)

Specialist

Consultant invited by a WB Task Manager, if he/she needs help with a particular aspect of the MIS preparation or supervision (to be part of a Preparation, Appraisal, Supervision and/or Mid Term Review Mission)

Background

(Brief description of the Project and the SF Information System)

- Project description;
- Project components;
- Size of the social fund (number of employees, number of regional offices, average investment amount per year, average number of micro-projects approved per year, average amount per micro-project);
- Components of the information system (financial management modules, micro-project monitoring modules and management indicators modules);
- Brief description of the network (number of working stations, characteristics of the server);
- Type of information handled by the information system.

Scope of work

(An MIS Consultant may be recruited at any phase of the project: i) project preparation; ii) MIS design, development and implementation; iii) project implementation (operation and maintenance). This section describes the phase(s) in which the Consultant will work and his or her duties.

The consultant performing these tasks should be the same throughout the project to ensure continuity and reduce the learning curve.

Project Preparation

- Introduce social fund staff to social fund information systems;
- Advise the social fund staff on processing subsystems (e.g. microproject proposal registrations, micro-project appraisal and monitoring, procurement, disbursements, accounting, etc.), data analysis subsystems (e.g.: information for planning and management, information for evaluation, etc) and integrity of an information system;
- Advise the SF on the appropriate dimensions of the information system (size of the database, volume of data to be managed, type and approximate number of subsystems and modules);

- Advise the SF on how to select software for a new information system (database, programming languages, operating systems, etc.);
- Advise on the different ways to develop an information system: using external consultant services versus "in-house" development;
- Advise on hardware network design and hardware acquisition.;
- Advise on skill mix and recruitment procedures for the SF Information Unit to ensure high quality work;
- Assess the feasibility of adapting software used in other social funds to the needs of the current social fund;
- Review experiences and products of other social funds and advise on the advantages and risks of using their software;
- Advise on the design, development and implementation of the information system;
- Give tips on training processes related to SF information systems;
- Help to set up an information plan.

Information system design, development and implementation

- Review the progress of the information system design/development;
- Together with SF staff, review management information needs;
- Assess the reporting obligations to the social fund board and donors;
- Test parts of the system that have been developed (screens and processing routines);
- Review and assess the relevance of forms and reports;
- Review and validate the consistency and accuracy of MIS data;
- Review and discuss with SF staff the findings and propose corrections, adjustments and/or improvements;
- Review technical specifications for hardware procurement and propose adjustments as necessary;
- Assess the capacity of the information unit staff and advise on capacity-building needs.

Project implementation

- Assess the capacities of the existing SF information system;
- Review and discuss with social fund staff the forms and reports produced at the different stages of the microproject cycle;
- Review and discuss with SF staff the forms and reports produced by the financial modules;
- Review the consistency of the data (degree of reliability) across the whole system;
- Based on previous findings propose and implement improvements in the existing information system;
- Review the capacity and functioning of the hardware network. Propose improvements in the hardware if needed;
- Review the involvement of social fund staff in the information system and propose a "marketing" strategy within the SF. If necessary, advise on training needs.

Consultant profile

The Consultant should have the following:

- Experience in project management (in World Bank projects, if possible);
- Experience in project organization methodologies;
- Experience in data modeling and data flow analysis for information systems;

- Knowledge of computerized Database platforms (Oracle, SQL-Server, Informix, Sysbase, ACCESS, VISUAL FOX-PRO, etc.);
- Knowledge of computerized "front-end" languages (VISUAL BASIC, POWER-BUILDER, DELPHI, ACCESS, VISUAL BASIC, etc.);
- Practical experience in social fund methods (outreach, micro-project appraisal, monitoring and supervision, procurement, impact & performance evaluation);
- Experience using information systems to manage social funds;
- Experience using project performance and impact indicators;
- System engineer, industrial engineer, business administration, civil engineer or equivalent degree;
- Proficient in technical spoken and written English (desirable).

Duration

The estimated period of the work will be _____.

Supervisor

The Consultant will work under the supervision of the WB Task Team Leader.

Background information

Consultant should provide the following information:
- Curriculum Vitae
- List of similar jobs performed with other WB division (desirable).

ANNEX 5

Terms of reference: MIS specialist in a SF

POSITION: National Consultant – MIS Specialist

SUPERVISOR: Project Coordination Unit Coordinator

WORK PLACE: SF Headquarters, *City*, *Country*

DURATION: X months with an initial testing period of 3 months.

Background

(Brief description of the origin and objectives of the institution)

- When and why the SF was established;
- Objectives of the SF;
- Donors financing the fund and donor financing the position;
- Financial components of the SF;
- Number and type of micro-projects to be financed yearly;
- Phase of the project;
- Reason for having an information system;
- Reasons for recruiting an MIS specialist.

Principal characteristics of the SF information system

(Brief description of the principal components of the existing SF Information System. If the SF does not yet have an MIS, describe the planned system)

- Purpose of the MIS;
- Description of the actors: operators and users;
- Reference to the procedures in the operating manual;
- Number of Subsystems and modules;
- Description of the Subsystems;
  - Outreach
  - Proposal Registration
  - Proposal Prioritization
  - Micro-project Preparation
  - Micro-project Appraisal and Approval
  - Procurement
  - Implementation, supervision and/or monitoring.
  - Impact evaluation
  - Project Budget management (plan and control)
  - Accounting

- Payroll
- Inventories
- Performance Indicators
- Impact Indicators
- GIS – Geographical Information
- Other

- Description of the hardware network (No. of Servers, No. of workstations, operating systems, communication characteristics, etc.)
- Number and type of users.

Scope of the work

(an MIS specialist could be recruited in any phase of the social fund, so the scope of work should be adjusted accordingly. In this section describe the phase(s) in which the MIS specialists will work and the duties that he/she will have)

The following activities will be executed in coordination and consultation with the WB MIS specialist.

Project Preparation Phase

- Together with other SF staff, design and prepare the SF operational manual;
- Assess the information needs of the different parts of the SF;
- Review and discuss with SF members the forms produced at the different stages of the micro-project cycle;
- Assess the reporting obligations to the SF board and donors;
- Review the composition and organization of SF MIS from other countries;
- Assess the local software and hardware market (type of database products, type of programming languages, availability of software development firms and/or local hardware and software support services);
- Design a first draft of the SF-MIS information system model (Database structure and information flow);
- Design the SF- MIS hardware network;
- Select the MIS platform [database and programming language (back-end and front-end software)]
- Assess other software requirements of the SF staff (word processing, electronic spreadsheets, visual presentation, drawings, etc);
- Determine the organization of the MIS unit (Developers, database administrator, network administrator and assistant);
- Prepare documentation to acquire the necessary hardware, database software and specific software applications;
- Prepare Terms of Reference for MIS unit staff, assist in the interview process and the evaluation of candidates;
- Together with the SF procurement unit coordinate and monitor the hardware and software procurement process;
- Receive the hardware and together with the provider install the SF network;
- Prepare Terms of Reference to contract a software development firm (or individual consultant);
- Together with SF procurement unit coordinate and monitor the selection of the software development firm.

MIS design, development and implementation

- Together with the software developer (SD);

  - establish the working schedule and the MIS design, development and implementation milestones.
  - review and adjust the first SF-MIS data model.
  - define SF-MIS screens and reports designs.
- Monitor the work of the SD;
- Monitor the software source programs;
- Monitor the finalized products (Subsystems and modules);
- Prepare and coordinate workshops between SF and SD staff;
- Receive and test the final product of the SD;
- Prepare and organize a SF staff training strategy;
- Organize training workshops;
- Ensure that source codes have been transferred from the SD to the Project and that relevant staff at the MIS unit have received the appropriate training to support, manage and make changes to the MIS.

Project implementation

- Manage the MIS unit;
- Supervise the work of MIS staff;
- Ensure proper use of the system (control data input, make sure that data are updated);
- Receive and analyze new information requirements from SF units;
- Assess the feasibility of incorporating the new requirements;
- Assess ongoing training needs;
- Ensure maintenance and upgrades;
  - Develop new reports or formats using existing MIS data, develop and prepare the required documents using a friendly report generator.
  - Develop TORs for complex modifications of software and contract a SD.
  - Prepare specific instructions for simple modifications of software and instruct the SD to perform the task *(this item depends on the agreement with the SD).*
  - Coordinate, monitor and evaluate the work of the SD.
  - Assess changing information needs.
  - Upgrade hardware and software according to changing requirements.
  - Monitor the work of the database administrator and the network administrator.
  - Other tasks as assigned by the project coordinator.

Consultant Profile

Much of this depends on the size of the MIS unit. If the MIS specialist is the only staff in the MIS unit, the requirements will be higher. Otherwise the SF can settle for a technical person who is a good manager.

The MIS specialist should have the following:

- Two or more years experience in design, development and implementation of **SQL-Databases** (examples: SYSBASE, ORACLE, SQL-SERVER, INFORMIX, ACCESS, VISUAL FOX-PRO, etc.).
- Two or more years experience in design, development and implementation of **Client-Server software applications** .
- Knowledge and experience with development tools (examples: Erwin CASE and/or Designer 2000 (Oracle) or similar computerized application).

- Knowledge and experience with client side rapid applications development (examples: VISUAL BASIC, DELPHI, POWER BUILDER).
- Experience using friendly report generator (example: Crystal Reports or similar tools).
- Knowledge of Web page design and development (desirable).
- Experience in hardware installation (networks with servers and working stations).
- Successful record of real, implemented and working applications.
- Analyst, programmer, computer scientist, software engineer or equivalent degree.
- Proficiency in written and spoken English.

Duration of services

The estimated duration of the work will be **_____.** A testing period of three months will be part of the contract.

Supervision

The MIS specialist will work under the supervision of the project coordinator and he/she will work closely with the software developer and the project staff.

Payments

The project will pay the MIS specialist on a _____ basis.

Background information

The consultant should provide the following information:
- Curriculum Vitae.
- List of similar jobs performed at other institutions.

Annex 6

Check list for assessing the scope and use of an MIS

Types of tools provided by the MIS

The following table provides a list of possible MIS modules. Not all will be needed in every project, but it shows the range of possibilities.

Table No. 1

Tool	Description	Modules in Current MIS
Socioeconomic inventory	Database containing information on households, communities, towns, regions, etc.	
Outreach strategy planner and controller	Information workshops during promotion campaigns, database on promotional literature.	
Micro-project portfolio	Key information on microprojects over the microproject cycle	
Micro-project evaluation tools: Eligibility criteria controller Unit cost database Budget builder Cofinancing structure analyzer Logical framework applied microprojects Cost-efficiency per type of micro-project analyzer Prioritization criteria evaluator Feasibility analyzer Appraisal report builder Micro-project economic feasibility analyzer	Processing tools used to facilitate evaluation.	
Procurement planner and controller Micro-project bids evaluator		
Micro-project supervision tools: Activities progress quantifier Statement of Accomplished Work processor Variation orders processor Micro-project finance and output progress analyzer Bonds or securities monitor	Processing tools used by the micro-project supervisors in order to facilitate their work.	
Ex – post evaluation tools: Baseline database Logical-framework evaluator		
Administrative, finance and accounting tools Accounting module Budget controller Payments controller Payroll administrator Personnel administrator Inventory administrator	Typical tools used to process, control and monitor financial information (disbursements, financial statements, checks, invoices, payroll, etc.)	
Planning tools:	Tools to plan and monitor SF activities	

Funds targeting matrix (pre – allocation methodology) Staff production planner and controller	(Annual Operation Plan)	
Management tools: PAD Key performance indicator controller Project and/ or Program impact indicator controller Reports for management information generator	Decision-making tools.	

Evaluation of MIS use in the SF

Table 2 Will help assess how the MIS is used. Interviews should be done with key people in the SF and those who work closely with the social fund. It is important during the interviews to ask the interviewees to use the computers to produce requested outputs. This will help verify the responses and give an indication of actual SF staff familiarity with the MIS.

Possible conclusions are:

- The MIS is well used and satisfies SF needs.
- The MIS is well used but additional features are needed.
- The MIS is not well used. Work is needed to adjust the MIS, and /or to promote its use by SF staff.

Level of staff satisfaction with the MIS

Table 2 also gives an indication of the level of staff satisfaction with the MIS Possible conclusions are:

- SF staff is satisfied with the service provided by the MIS.
- Some parts of the MIS need improvement.
- The level of dissatisfaction is so high that the MIS needs fundamental rethinking. Comments collected during the interviews will give indications of how to do the re-engineering.

Quality of information

The following activities can be used to assess the quality of information in the system[9]:

- Review the SF Operational Manual and the Project Appraisal Document with special attention to the reports and formats provided in the annexes.
- Interview key SF staff.
- Ask for samples of output and discuss with key people (i) the meaning of the information (ii) the frequency of use of the reports; iii) the users of the information; and iv) the degree of influence in decision making.

[9] In order to do a good assessment the ME should dedicate sufficient time (one or two days) to analyze in detail the meaning of the information that the MIS is producing.

Accessibility of information

One important issue is the accessibility of the information or the service provided by the MIS. A SF could have a very nice MIS, but if it is not used properly due to problems with accessibility, it will be under used.

The following will help assess this issue:

- Analyze the ratio of *staff members/ available workstations* (personal computers). The ideal ratio is 3:1. The higher the ratio is, the more additional computers will be needed. This analysis should be complemented by the analysis of the number of software modules provided by the MIS and the number of users.
- Analyze the output formats and navigation facilities (MIS Client Front-end). The friendlier the MIS formats, the more comfortable users will be and the more the MIS will be used. The presentation of the forms through which the users insert, consult or manage information plays an important role. A text interface will not be as attractive as a graphic interface. Another point is the order in which the different forms and data fields are organized. A fluid navigation process is a good indicator of an adequate Client Front-end. The best way to assess this is to sit at the computer and navigate through the MIS.
- Ask for reports and format samples, assess the delivery time of these documents, analyze the form and quality of presentation. If the information is clear and the delivery time is acceptable, accessibility to information is not an issue.

Ease with which primary data is entered

The ease with which data is loaded into the system is key to ensuring effective use of the MIS.

To estimate the simplicity or complexity of this task, ask the following questions:

- Does the SF have systematic procedures to collect the information (flow charts, algorithms, formats, handbooks)?
- Who inputs the data?
- Does data come from external systems?
- What is the incentive to input data (required as part of a job or data will simplify work)?

Operating performance of the MIS

This deals with both hardware response and software behavior.

Typical questions about the MIS operating performance are:

- How often does the system crash?
- What is the response time of the system?
- Does the MIS unit provide technical assistance in a reasonable time?
- How often does a user lose information during working sessions?

TABLE No. 2
Evaluation of MIS Use

Unit	Staff to interview	Grade of MIS use within the SF								Level of staff satisfaction with the MIS	
		Employees		Ideal SF range of MIS application[10]		Range established by the interviewee [11]	Use of alternative tools (Excel, formats,)[12]			Satisfaction [13]	Comments and suggestions[14]
		In the Unit	Using the MIS	As processing tool	As information tool		25%	75%	100%		
Outreach	Head of the Unit Outreach Officer			 10 – 20%	10 – 20%						
Microproject Formulation	Head of the Unit Operations officer			 30 – 60%	5 – 10%						
Evaluation	Head of the Unit Micro-project Evaluator			 40 – 70%	15 – 25%						
Steering Committee	SF Director Committee members				0 – 5%						
Procurement	Procurement Officer			5 – 10%	10 – 20%						
Supervision	Head of the Unit Micro-project Supervisor			 40 – 70%	15 – 25%						
Audit	SF internal auditor				20 – 30%						
Ex–post Evaluation	Evaluator			10 – 20%	20 – 40%						
Administrative and Finance	Head of the Unit Accountant Treasurer Budget Controller Personnel Administrator			 50 – 70% 20 – 30% 20 – 30% 10 – 20%	30 – 50%						
SF	Managers				15 – 30%						
Planning and Monitoring	Head of the Unit			20 – 50%	30% - 70%						

[10] Based on the personal experience of SF MIS Consultants, a standard SF could have a satisfactory or "ideal" range of application between its different units. The percentages represent the grade that the MIS help the SF staff to perform their daily tasks or assignments.

[11] Column to write the range estimated by the interviews.

[12] The more alternative tools a SF uses, the lower the utility of the MIS.

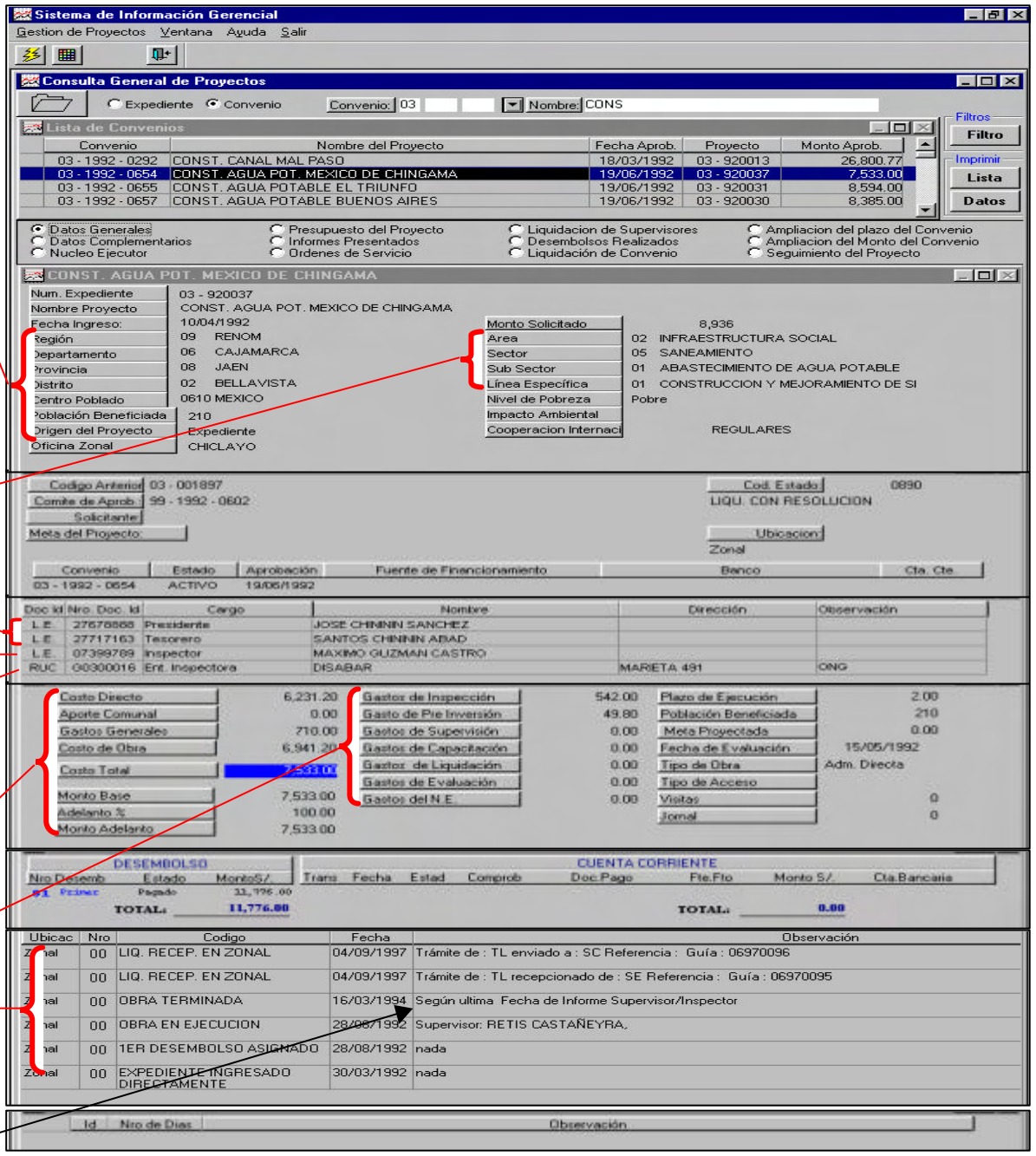
[13] In a scale from 1-10 (low – high satisfaction) write the answer given by the interviewee.

[14] Take notes about ideas to improve, adjust or complement the MIS.

Annex 7 Sample reports

Detailed report for a subproject

The following detailed report for a subproject in the Peru Social Fund (FONCODES) presents a listing of general data of various types (financial, technical, geographic,...). Such reports are very useful to get an overview of a given subproject. Though they do not require complex data processing, few MIS can produce them due to shortcomings in the integration of different databases.

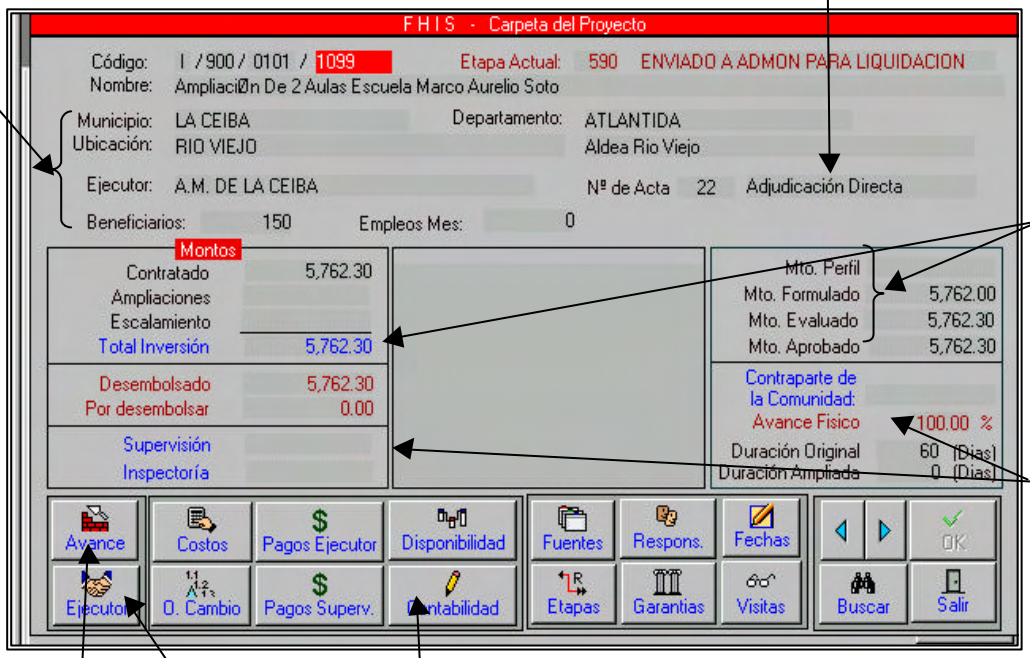


Summary report for a subproject

The following report from the Honduras Social Funds (FHIS) complements the more detailed report presented above. It only presents selected key indicators that enable managers to quickly assess the situation and take decisions if necessary.

Basic data on the subproject:
- municipality
- location
- executing agency (municipal association)
- # of beneficiaries

Procurement method (direct contracting here)



Key financial indicators (total investment cost, disbursement, balance...)

...

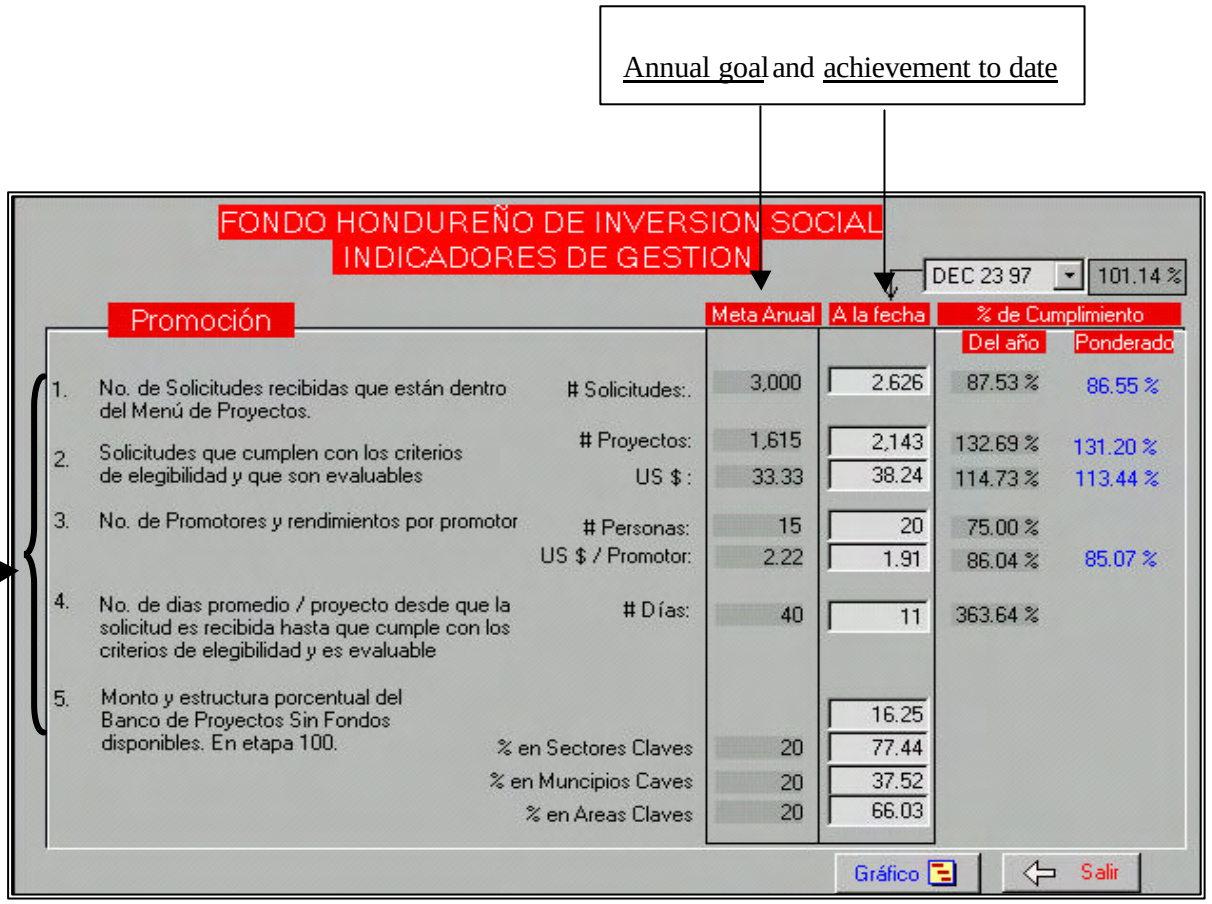
associated with

Key technical indicators

Clicking on these buttons will give access to more detailed information on technical progress, executing agency, accounting...

Report by project-cycle phase

More sophisticated data processing enables the production of reports with aggregate information as in the following report from FHIS.



Selection of a few key indicators on the performance of outreach ("promocion") activities:

1. # of requests received within the project menu
2. # of requests consistent with eligibility criteria and "assessable"
3. # of outreach agents and average productivity
4. average # of days per project between request and satisfaction of elibility criteria for assessment
5. % of requests falling in key categories

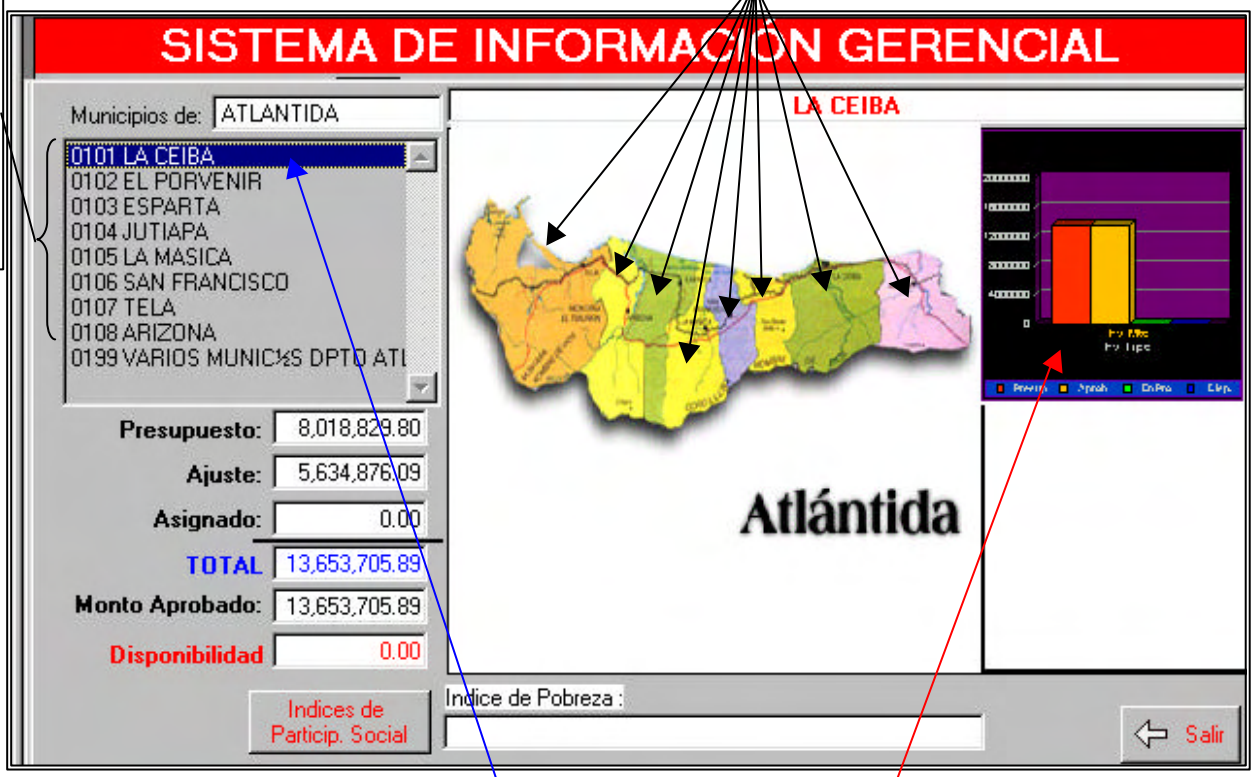
Report with maps

The cartographic representation of an indicator (in this case a poverty index) makes it possible to compare quickly the situation between different municipalities in a given department

geographic code :

01 for Atlantida and

01-08 for municipalities)



On this report, a histogram makes it possible to visualize quickly the budget information associated with the municipality of LA CEIBA in the Department Atlantida
The precise amounts appear in the windows below.