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LAND REFORM IN AFGHANISTAN (LARA)

STRATEGIC INFORMATION TECHNOLOGY PLAN 2011–2013

SEPTEMBER 2011

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ACRONYMS AND ABBREVIATIONS

ACO	Office of Anti-Corruption
AGCHO	Afghan Geodesy and Cartography Head Office
Arazi	Afghanistan Land Authority
ASFDI	Afghanistan Spatial Data Infrastructure
BI	
BO	Business Object
BPM	Business Process Management
BSC	Balanced Scorecard
BSS	Business Services
CORS	Continuously Operating Reference Station
EAI	Enterprise Application Integration
ERP	Enterprise Resource Planning
ETA/TIA	
GIS	Geographic Information Systems
GPS	Global Positioning System
IAS	Internet Authentication Services
ICT	Information and Communication Technology
IDLG	Independent Directorate of Local Governance
KPI	Key Performance Indicator
LARA	Land Reform in Afghanistan
MAIL	Ministry of Agriculture, Irrigation, and Livestock
MOCIT	Office of Ministry of Communication and Information technology
MOF	Ministry of Finance
MOI	Office of Ministry of Interior
MOJ	Office of Ministry of Justice
MOM	Ministry of Mines
MUDA	Ministry of Urban Development Affairs
MUN	Municipalities

MWE	Ministry of Water & Energy
PKI	Public Key Infrastructure
POF	Office of President
RDBMS	Relational Database Management System
REO	Regional Offices of MAIL, AGCHO, Arazi, IDLG, & MUDA
SOAP	Service-Oriented Application Protocol
SCO	Supreme Court
UNI	Universities
UPS	Uninterruptible Power Supplies
USAID	United States Agency for International Development
VPN	Virtual Private Network
WGS	World Geodetic System

PREFACE

The United States Agency for International Development (USAID) Land Reform in Afghanistan Project (LARA) is managed by Tetra Tech ARD under USAID Contract No. 306-C-00-11-00514-00, with implementation assistance from its partners Tetra Tech DPK, International Land Systems (ILS), Development & Training Services Inc (dTS), and Landesa (formerly the Rural Development Institute). LARA's primary government partners are Arazi (formerly the Afghan Land Agency), Afghan Geodesy and Cartography Head Office (AGCHO) , Ministry of Urban Development Affairs (MUDA), Independent Directorate of Local Governance (IDLG), as well as the Supreme Court and selected local municipalities.
The purpose of the LARA project is to develop a robust, enduring, and Afghan-owned and-managed land market framework that encourages investment and productivity growth, resolves/mitigates land-based conflict, and builds confidence in government's legitimacy, thereby enhancing stability in Afghan society.

The Project continues USAID/Afghanistan's support for land reform and land rights strengthening that began through the earlier LTERA Project. The LARA Project currently comprises an 18-month Base Period and a possible 18-month Option Period, with a total contract amount of $41.8 million. While this document also includes activities and tasks under the Option Period, the current Work Plan that we operate under contemplates only the 18-month Base Period, ending on July 31, 2012.

LARA is designed to contribute to USAID's AO and Afghanistan National Development Strategy. Three influences will help shape LARA's contributions to this Objective: (1) the foundations provided by the former USAID Land Tenure and Economic Restructuring in Afghanistan (LTERA) project that provides a starting point and methods that can be adapted; (2) USAID/Afghanistan management objectives including Afghanization and conflict mitigation; and (3) the following major LARA objectives:

- Improve property rights delivery (land administration and formalization);
- Enable all citizens (women, minorities, and vulnerable populations) to exercise their rights through public information awareness (PIA);
- Strengthen land dispute resolution processes to reduce conflict and promote peace and stability;
- Promote economic development through clear and enforceable property rights, PIA, land rights delivery, and land dispute resolution; and
- Strengthen institutional, policy, and legal reform to secure property rights for Afghan citizens;
- Provide assistance in the cross-cutting areas of gender, training, PIA, and private sector development.

These objectives are supported by three components that provide the over-arching structure for programming activities and tasks in the work plan are as follows:

1. "**Strengthen Land Tenure Security through Formalization and Upgrading of Informal Settlements**" - Support MUDA, Supreme Court, AGCHO, IDLG, Arazi, Communities and the Municipality of Jalalabad with informal settlements upgrading, formalization, cadastral mapping, women's inheritance and land rights law, community based dispute resolution, laws for urban planning and land use regulation, and training in planning and enforcement (related to SOW Activities 1, 2, 3, 4 & 5).
2. "**Legal Framework**" - Provide limited assistance to Arazi to identify, manage, lease, and obtain revenue from Afghan government lands and provide targeted technical assistance (related to SOW Activities 6 & 7).
3. "**Capacity Building**" - Build capacity of public (AGCHO, Arazi, IDLG, MUDA, Supreme Court) and private sector service providers to improve and streamline land tenure processes to Afghan private and public sectors (related to SOW Activity 8).

1.0 INTRODUCTION

Strategic planning of information systems defines the vision of the Information Technology (IT) management in the short, medium, and long-term. The techniques used to achieve this planning (supported by information engineering) are important for the reflection, study, and analysis in terms of the systems needed to achieve the strategic objectives that the organization requires to fulfill its mission. It is also an essential factor for the production of information generated by each critical success factor identified by the different actors in the organization.

Information and Communications Technology (ICT) will allow institutions to project their actions more broadly and with a wider scope. Achieving this goal requires high levels of efficiency in the processes of information management and consolidation, timeliness, completeness and quality of education, all of which ensure the effective use of resources.

Also, the use of technology standards is essential for efficient and effective information architecture in order to avoid the proliferation of isolated systems that use different technologies according to different standards. This entails extra costs in computing resources, support, and maintenance. In turn, the implementation of standards provides the necessary framework for infrastructure development and implementation of information systems and provides interoperability, portability, and adaptability of applications.

Coupling and interaction of diverse information generated by a multitude of players is a real challenge. It requires the arrangement of ideas in such a way that it can foster real participation by creating opportunities for people to obtain land, facilitate the reduction of conflicts and reduce poverty. In Afghanistan, eliminating the technological limitations will be the guarantee necessary to support all parties in fulfilling their obligations and will allow the lives of Afghans to change - a need which is strongly felt by all stakeholders.

The Strategic Information Technology Plan for the Land Reform in Afghanistan (LARA) Project establishes a three-year development phase, with broad support for information technologies facilitating greater agility and quality services as required to meet public expectations.

Fulfilling this goal requires a process and approach that allows different government agencies to respond to changes as they arise and also enables them to respond quickly, efficiently, and effectively in meeting the objectives of the institutions involved in these processes.

Based on these factors, we can achieve the construction of a system that relates the different agencies and participants as sources and receivers of information. We can combine these nodes in a controlled process to structure the information flows of the land management processes, which in effect allows the monitoring of activities and corresponding formulation of policies and programs.

According to its mission, LARA will develop a robust, enduring, and Afghan-owned and -managed land market framework that encourages investment and productivity growth, resolves/mitigates land-based conflict, and builds confidence in the government’s legitimacy, thereby enhancing stability in Afghan society.

1.1 STRATEGIC INTEGRATION

Taking into consideration that the LARA project involves several institutions directly and indirectly, we can identify four major strategic elements which are:

- Processes for an organizational infrastructure; and
- Services delivery Strategy.
- Information Systems Infrastructure and Processes; and
- Information Technology Strategy.

The last two elements are the integrators that link seamlessly with the other elements and have the capacity to maintain dialog with other institutions with an information interchange protocol.

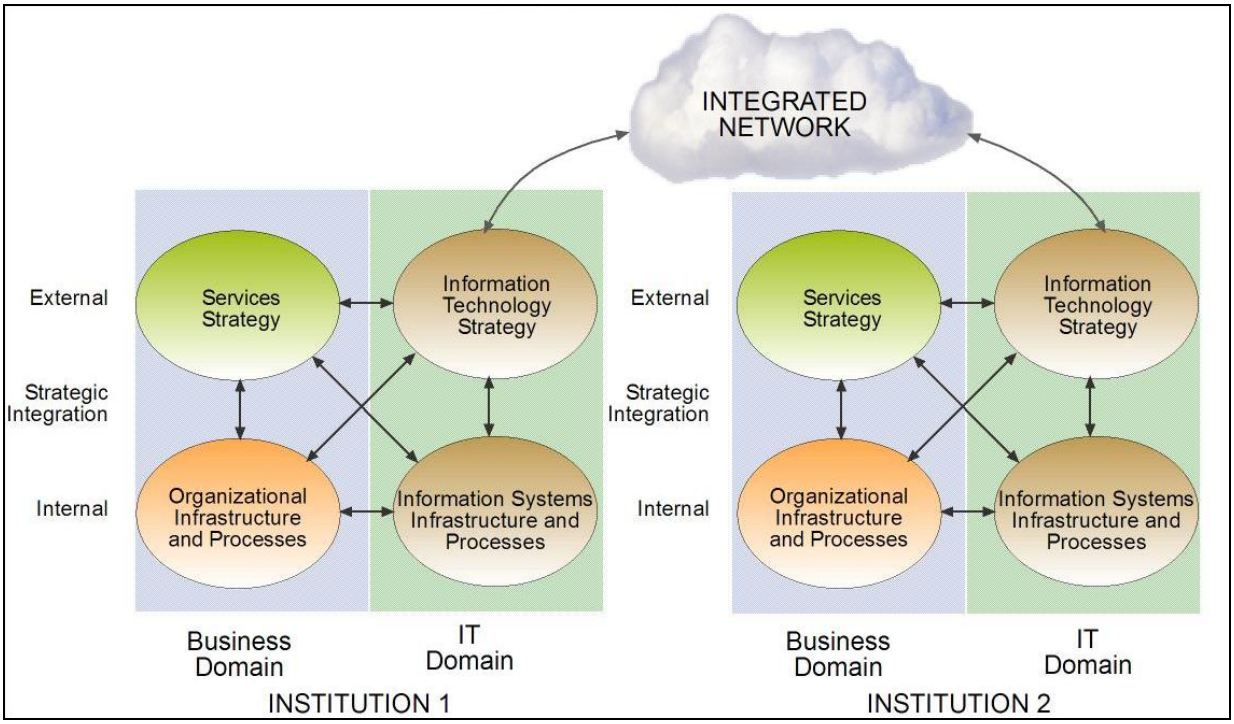


FIGURE 1: LARA PROJECT STRATEGIC IT PLAN

From Figure 1 it can be seen that each institution has the system concept developed in accordance with business rules and processes, and the dialogue among institutions is routed via the workflow system. So the systems remain integrated regardless of whether the rules may change at a later time.

The objectives of LARA are to:

- Improve property rights delivery (land administration and formalization);
- Enable all citizens (women, minorities, and vulnerable populations) to exercise their rights through public information awareness (PIA);

- Strengthen land dispute resolution processes to reduce conflict and promote peace and stability;
- Promote economic development through clear and enforceable property rights, PIA, land rights delivery, and land dispute resolution; and
- Strengthen institutional, policy, and legal reform to secure property rights for Afghan citizens;
- Provide assistance in the cross-cutting areas of gender, training, PIA, and private sector development.

The IT Strategic Plan will support public sector agencies (such as Arazi, MUDA, AGCHO, IDLG, municipalities, and educational institutions) and develop organizational and technical capacity through:

- Facilitation of an agency institutional development needs assessment;
- Provision of technical assistance to meet those needs;
- Assistance in developing and applying inclusive service delivery and dispute resolution models; and
- Capacity-building training in management, leadership, and technical competencies for each agency/company staff.

1.2 ORIENTATION OF STRATEGIC ANALYSIS

The main objectives of this Strategic Information Technology Plan are based on three basic principles: Orientation of the management environment, quality of information and services provided.

It is important to be aware that any such plan will require the participation of all partner organizations involved in the LARA project. In this regard, the Strategic Information Technology Plan includes a set of elements and activities that serve to help implement, control and monitor the plan.

The first step in the analysis is to establish the definition of the processes.

Obviously, all improvement recommendations cannot be done without taking into account the nature of land management and the role it plays in Afghan society. A useful first step is to identify the agents that are involved and to understand the detailed processes and procedures they develop and use.

2.0 ORGANIZATIONAL PRINCIPLES

Based on the factors stated in Section 1.0, it is necessary to identify and disaggregate the activities of institutions, which will require constant interaction with external agents (uses and agencies). These activities can be grouped into three main sections:

1. Organization and Services for Land Management;
2. Information and Communication; and
3. Coordination and Interaction.

2.1 ORGANIZATION AND SERVICES FOR LAND MANAGEMENT

It is important to note that organization around the services provided should rely on the needs of users. Also, excellent coordination would be needed between the institutions that form the land management sector.

As a result, the entire network must support decentralized management without losing control or producing duplicates or inconsistencies in the procedures to be executed. To achieve this, the following should occur:

- Institutions should have processes and procedures that adequately link to each one of their responsibilities without duplication of information. They should be open to participating institutions with workflow control by managing and maintaining control over any user application that is being processed.
- For administrative functions associated with services such as tax payments systems, services must provide individual reports affecting the procedures performed by each institution. In case of a user-requested service, the system should report the total amount broken down for each participating institution.
- For each institution the system must provide data as flat files or interfaces that may be registered in a financial accounting system. The amounts paid by users should be placed according to the rules of distribution.
- Extension should consider training: courses, seminars, and courses for trainers and participants in land management are necessary to maintain a high level of knowledge by professionals within the sector.

2.2 INFORMATION AND COMMUNICATION

It is critical to have a good knowledge of the land management sector and the potential agencies involved, their specific needs, and the sector area where each agency fits. It is also critical to be able to integrate their capacity.

It is important to provide the necessary flexibility in the management of communication with these agencies and their partners in the elements they manage. In this sense, the following key elements were identified:

- Timeliness and flexibility for users, as well as interested parties, to participate in land management business activities in real time.
- Information for participants about the status of obtaining their land titles, automatic control and management of security, availability of places in the time of completion for each operation, and reporting real-time status of their activities through integrated communications networks with the client.

2.3 RELATIONSHIP WITH STAKEHOLDERS

Consideration should be given to individuals, businesses, and public institutions involved in the land process. There needs to be a fluid exchange of land information for the efficient development of their operations:

- Facilitate information exchange at the level of each communication network.
- Provide participants with information about the behavior of production in those areas of intervention in order to facilitate the normalization of land use, information and statistics on society development.
- Have a management system that enables increased leadership for institutions part of LARA Project.

The coordination and interaction with the participating institutions and processes are developed with the proper automation is paramount among the areas of activity, since the professional capacity to perform tasks is most important to focus on the strategies of the LARA Project:

- Internal management in real time between the various departments involved in operations, supported by an electronic infrastructure, will facilitate a more systemic approach for business professionals.
- The system must allow workflows by performing continuous monitoring of processes and facilitate routing to the areas and professionals involved in some processes to generate automatically the desired automation.
- The system should facilitate planning and coordination of special events to be established as a result of management actions carried out by the institutional component of the network.

3.0 ANALYSIS OF THE ENVIRONMENT

The following items are essential characteristics of the land management environment.

- A first analysis of the environment seeks to identify threats and strengths that are present in managing the institutions. In this sense, they are a set of elements that occur as a result of the continued development of technology that affects the development within the institutions and the services they provide.
- The first symptom of not applying advanced technologies can result in low number of outputs due to not having consolidated then cadastre and land titling information throughout the whole country.
- To a large extent, the processes can be managed by Web portals that provide services where users can make their applications directly by interacting with the system. This capability is not available today.
- The Websites should have access to the private sector (banking, agencies) so that they offer opportunities for users to make payments for services and taxes. Lacking this ability means lacking all the associated bargaining power that a potential business demand requires. However, having attractive approaches to niche markets helps strengthen the Afghan economy in accordance with master plans, with market lines (such as land lease for agriculture purposes, concessions on the mining exploitation, creation of areas of logistical storing), and offering elements of interest to potential investors.
- The overall economy is moving increasingly toward a global market, in which it will lose its frontiers. This requires not only the participation of local markets, but also the right technology and responsiveness by providing logistics and financial guarantees necessary for the execution of operations.
- Compliance with the new requirements. Companies and institutions of the labor market demand increased levels of training for professionals in new technologies and languages (especially English) as well as leadership and teamwork. These circumstances make it necessary to provide these leaders with modern, attractive tools enabling them to compete and perform actions beyond the environment where they currently operate, and which also guarantees them the necessary credibility.
- Consideration of a reference unit environment, as well as the elimination of financial uncertainty, provides for decision-making in a stable scenario likely to attract investors.
- Difficulties in communicating with the outside world can affect business and therefore its sustained growth.

Of the above descriptions, we can deduce a series of threats and opportunities, some of which are listed in the following subsections.

3.1 THREATS

- Increased investment of foreign competition in the short term that may affect land management if the system is not consolidated.

- Increased competition in the medium- and long-term considering the region and its possible market options, according to the stability that is achieved in terms of land reform
- Internal, non-goal-oriented competition in the institutions can generate confusion among objectives that the government looks for, with regard to land reform ability to provide efficiencies, effectiveness, and reduced conflicts.
- Unable to provide adequate service due to lack of elements of information technology supporting land management processes and procedures.
- Lack of rapid adaptation to face market challenges that may suddenly arise.

3.2 OPPORTUNITIES

- Consolidate regional co-existence, providing short- and medium-term economic stability generation through the creation of productive capacities in the new order of land reform.
- Increased competition in the medium- and long-term in conjunction with the increase in competent bodies to enter with products of interest to regional markets and open the way to new frontiers in national and international commerce.
- Potential emergence of new players to strengthen stability by opening the demand for products, which builds the land industry and strengthens local economies.
- Healthy internal competition in the institutions, knowledge, and unity focused on a common objective of efficiency and effectiveness.
- Development of new forms of market management with the addition of new technologies, and teams with strong knowledge of the topic of land management.
- Economics of the region, good absorption of new projects and products to attract investors and entrepreneurs.

4.0 OBJECTIVES AND ACTIONS

The previously mentioned considerations, derived from the analysis of Afghanistan and its surroundings, have raised the proposal of strategic planning in information technology based on the following objectives:

- Improvement of the organizational access to IT;
- Automation of processes and procedures that are to be developed in the institutions;
- Increasing the outreach of the institutions; and
- Establishing a suitable technology platform for the challenges of the institutions and ensuring security of information.

4.1 OBJECTIVES

4.1.1 GOAL 1: IMPROVING THE ORGANIZATIONAL ACCESS TO INFORMATION TECHNOLOGY

For the areas of technology of the institution, it is considered as a priority to enhance the implementation of an Integrated Information System.

In this field, the following objectives apply:

- Improving coordination among areas of the institutions in terms of information technology.
- Improving coordination among the institutions with supporting technology.
- Increasing the information base required for the development of activities.
- Monitoring and tracking the quality of information generated and required.
- Strengthening the capacity of systemic response areas through training of professionals in computer science.

To achieve these objectives, we carried out the following:

Action1 Each area in the institutions related to land management (and links to other institutions considered in the IT Strategic Plan) were evaluated with regard to the current and future activities needed to develop and establish best practices regarding technology and related information.

Action 2 Implemented a Land Cadastre System and a Land Registry Information System that permitted the automation of the cadastre and the register of land titles and associated documents.

Action 3 Consolidated an information management system and established management indicators and quality of services provided both internally and externally.

Action 4 Strengthened the role of the Quality Committee, with active participation of those responsible for the areas of the institutions.

Action 5 Promoted training in handling applications of information technologies.

4.1.2 GOAL 2: AUTOMATION OF PROCESSES AND PROCEDURES TO BE DEVELOPED IN THE INSTITUTIONS

- Improve the development of processes and procedures through the implementation of systems to support management through workflows.
- Establish the indicators related to processes for their integration into a management system for business intelligence and strategic monitoring.
- Increase the participation of professionals from the fields by introducing software tools to support management.

To achieve these objectives, we carried out the following:

Action 1 Gathered information about the processes and procedures that run in every area of every institution and which are related to land management. Performed analysis of current processes of each area of the entity in its current state and identified improvements that can be applied to these processes.

Action 2 Defined and implemented information systems requirements and processes associated with conducting areas.

Action 3 Implemented workflow system for the efficient execution of automated processes and procedures that are carried out.

Action 4 Defined, together with the heads of professional areas, indicators and measurement variables to implement a management system for business intelligence and strategic monitoring.

Action 5 Encouraged the use of new technologies in relation to the development of the activities areas of the institutions.

4.1.3 GOAL 3: INCREASING THE OUTREACH OF THE INSTITUTIONS

- Extension of this goal to land management is considered essential, facilitating and thereby creating the interest of investors and entrepreneurs in establishing industry activities.
- This general objective can be summarized in establishing links with other institutions and financial systems in order to increase the operations and activities in which the following will take place:

Action 1 Establish formal links with institutions in the public sector.

Action 2 Perform activities of mutual interest to the parties.

Action 3 Establish links with national companies, investors, and the banking system to create spaces needed for new businesses, information exchange, and presentation.

Action 4 Integrate the development of Web Portals in the institutions related to land management operations abroad considering different languages.

Action 5 Develop systems that allow end-user interaction and also follow up on the application they require.

4.1.4 GOAL 4: ESTABLISHING TECHNOLOGY PLATFORMS FOR THE INSTITUTIONS IN LAND MANAGEMENT, ENSURING INFORMATION SECURITY

The developments of recent years have kept to very low-level platforms of hardware and networks, as well as basic architectures in information systems that support critical processes of the institutions involved. There was no plan to update itself according to the processes and the needs of institutions.

The challenge for the next five years will be to generate an appropriate management platform; to complete, refine, and integrate information systems; and change the manner that IT services are delivered to customers inside and outside the organizations.

Electronic tools (with a sufficient degree of maturity and within the current scene) will be proposed to be used in the construction of information systems necessary to achieve the objectives outlined in the previous sections.

Listed below are some features that give coverage to the functions and procedures related to the development of land management activities that information systems should have:

- Publication and interchange of information among the institutions related to an integrated process and management procedure supported by workflow systems.
- The information and documents of land management to be used in different areas of the institutions and external actors need the facilities of communications technology and transportation and storage of such documents, which will acquire great importance also in statistical analysis.
- In fact, independently of any other improvements, having communication technology for exchange and document accessibility will bring multiple benefits in terms cost and time management. In this regard, the institutions involved in land management processes have to enable the processes and procedures which will integrate all the institutions in the use of an operations management system that is projected to have all the information needed to develop a fully consolidated line operation allowing institutions to maintain an agile interaction with users and clients.
- The Strategic Information Technology Plan considers managing information, the implementation of systems integrating electronic trading operation over Internet (similar to those used on the private market and the industry) in order to increase management flexibility, a condition required by an increasingly competitive changing market.

5.0 SYSTEMS AND TECHNOLOGY IN THE INSTITUTIONS

5.1 INFORMATION TECHNOLOGY IN INFORMATION TECHNOLOGY AREAS

This section provides recommended improvements that will allow institutions to address more thoroughly the challenges mentioned above. These require the improvement and/or development of the IT areas of the institutions its related environment with the land management sector, based on the Integrated IT Strategic Plan.

5.2 HARDWARE AND SOFTWARE PLATFORM OF THE INSTITUTIONS

The infrastructure that the institutions maintain currently lags technology. This means that the current infrastructure is very basic and has many constraints to integrated processes and procedure management system in the institutions. There is no management system that supports or performs the exchange of information through systems among institutions.

There are some attempts to implement systems that support timely management but do not follow a comprehensive plan, which in turn creates islands of information that do not consider the chronological or historical events of processes in which different entities are involved. Consequently, in most cases the activities are performing manually through maintaining a high volume of documentary information. The work stations are primarily used to write memos or resolutions that accompany preset forms that were used and which were filled out manually. This way, the key information is repeated in different forms used in the management of the processes. These processes have involved stages at other institutions, making management extremely slow, causing inconvenience to users, and they do not help to provide peace and social or economic growth.

There are a number of institutions involved directly or indirectly in the process of land management. The IT Strategic Plan focuses first on the importance of the systemic basis in order to identify, standardize, and provide a cadastral survey on the disposition of public and private lands. This way it would allow the government to establish policies enabling the disadvantaged segments of society to own a parcel of land legally, thereby reducing violence, and creating the premises of welfare generation.

The institutions directly involved in the processes are:

- Afghan Geodesy and Cartography Head Office (AGCHO);
- Arazi;
- MUDA;

- IDLG;
- Regional Offices of Ministry of Agriculture, Irrigation, and Livestock (MAIL); AGCHO; Arazi; IDLG; and MUDA (REO);
- MAIL;
- Office of President (POF);
- SCO;
- Ministry of Finance (MOF);
- Ministry of Mines (MOM);
- Ministry of Water & Energy (MWE); and
- Municipalities (MUN).

Institutions indirectly involved in the processes:

- Ministry of Justice (MOJ);
- Ministry of Interior (MOI);
- Ministry of Communication and Information Technology (MOCIT); and
- Oversight and Anti-Corruption Independent Directorate (OACID).

6.0 GENERAL TECHNOLOGICAL MODEL

As the institutions related to the LARA Project do not have adequate systems to support a cadastre information and land titling registry, a model was defined that supports the technological components to be considered. This is necessary to facilitate the integrated management and should be supported by adequate infrastructure hardware. The technological model involves a number of layers. Figure 2 lists the most significant elements involved.

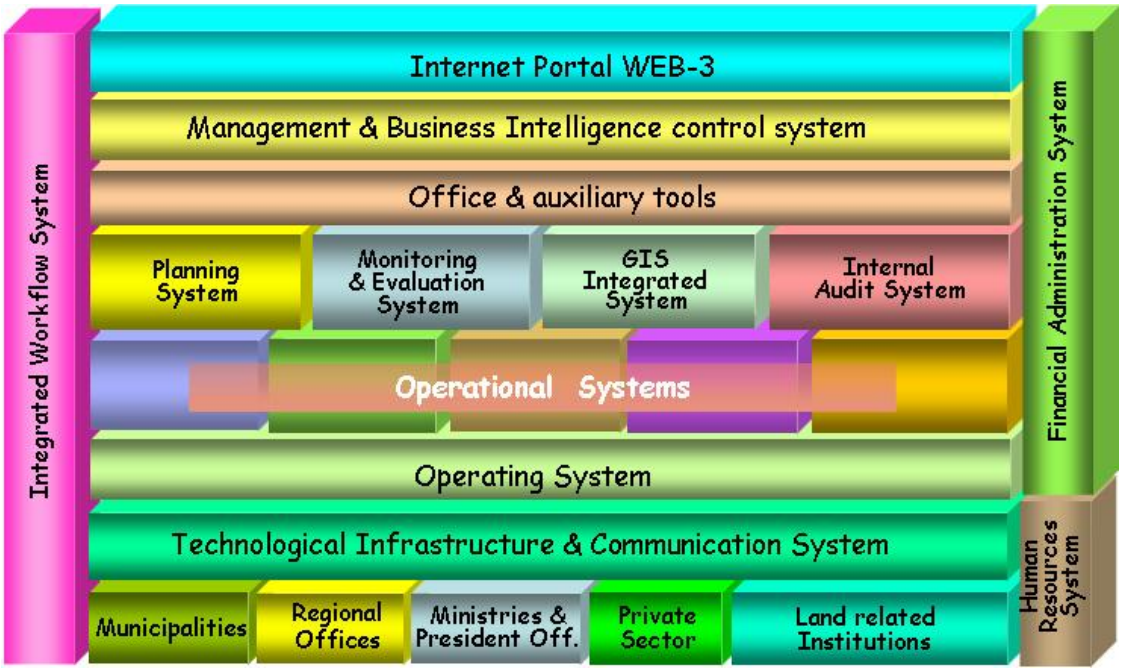


FIGURE 2

This model includes the main systems that support the activities of institutions, particularly the Land Management System, which must be supported by a computing platform according to market requirements, allow their growth, and move toward a total integration of institutions involved.

The model is structured on different levels and layers that respond to a structure relying on the bottom-up aspect of information management. It flows from the data taken through processes that are executed according to the functional areas, through the organization of the institution, allowing management to provide consolidated information for decision-making.

6.1 SOFTWARE SYSTEM COMPONENTS FOR THE GENERAL TECHOLOGICAL MODEL

As no specific system software is available today in the institutions to support the management, we describe here the different components included in the general model. These are:

- Workflows System;
- Document Management System;
- Planning System;
- Internal Control System;
- Human Resource System ;
- Business Intelligence and Balanced Scorecard System; and
- Administrative Management System Financial Accounting (Enterprise Resource Planning [ERP]).

Note: the specific technical core systems (operational systems) will be described in the specific model of each institution.

6.1.1 WORKFLOW SYSTEM

A Workflow System is used to establish the definition of all the processes and flows that the institutions may be published interchange and updated on the internal network or intranet and Internet.

The process control system for Business Process Management (BPM) or Workflow must be approached as a tool necessary to define the processes and workflows of the institutions. Any processes that interact with mission systems and the systems of other institutions processes are controlled by this system

Thus, job-sharing and cooperation is of great importance in organizations in order to manage distributed documents, email, transactions, and operations, among others. It would also facilitate the flow of information among the various units that make up the Land Management System processes, significantly decreasing administrative costs and achieving greater integration.

Workflow systems can be initially based on a document management tool (such as Office Paper Zero) to store and manage objects that travel documentaries for the flow such as images, text, video, office files, and others. Thus, electronic documents can go “hand in hand” and each person can perform the functions (e.g., certified, attach documents, revise, expand) assigned to them within a pre-established order.

The management of documents will be transformed into an orderly and controlled process at all times, facilitating a level of control which would be impossible to achieve by manual methods.

6.1.2 DOCUMENT AND CONTENT MANAGEMENT SYSTEM

The model presents the need for a document management system and content management, to give a more dynamic presentation of Web pages, allowing participation, and making available content management for the information to be published on the Internet portal.

Much of the success and attractiveness to potential clients depends upon generating interest in land management activities. For example, open the interest of investors to obtain land rights for the creation of productive processes, which allows the creation of employment and improves the economy of a region.

Fundamentally, document management means having control over what is active on the Website, version control and management support, and a technical group of senior management to assess and control what is published each time. The right approach would be to start with specific elements of improvement that would foster a participatory model, relying on the goals for engaging in markets of interest regarding the orderly exploitation of land. Document management integrates all processes and procedures involved in the aggregation, processing, classification, clustering, authorization, presentation, and distribution of useful purposes of an institution.

This definition integrates different tools, each focusing on a different context:

- Document management: more oriented cataloging and retrieval of large files documents, maps, cartography.
- Presentation Managers Website tools: more focused on rapidly building sites.
- Knowledge managers: more focused on structuring and data correlation.
- Composition tools: facilitate paper publications which can be easily transformed into a Web version.
- Departmental management tools: team-oriented for editing or introducing new information.

Reduced to three, the capabilities of content management systems are as follows:

- Content acquisition;
- Content handling; and
- Content delivery.

The vital element is the core system or content repository store (considering any content we want to store information in a structured way), where the information is structured in such a way as to be easily manipulated and exploited. This repository will typically be a database; as technology evolves, ideally this would be a native XML database that fits the way we typically manage Web pages.

6.1.3 PLANNING SYSTEM

The Planning System should consider the entire document management, workflow processes, and procedures that the institution maintains. Planning also sets new actions to establish the Directorate General of the institution and to monitor and control these actions, allowing the definition of new strategic objectives of the institution. The model establishes a Business Intelligence (BI) System panels to provide control and monitoring of performance indicators as well as strategic dashboards Institution applied with a Balanced Scorecard (BSC).

6.1.4 INTERNAL CONTROL SYSTEM

The evaluation of the effectiveness of internal accounting control in an organization whose books are reviewed by an independent public accountant is an essential part of the audit work performed. It is important that the auditor is familiar with the basic elements that contribute to effective internal control and is in a position to form an opinion on whether internal control is adequate. The ability to assess the procedures and practices of the organization under consideration depends on practice and experience of the auditor. However, the auditor has an excellent opportunity to observe a variety of accounting systems and to acquire knowledge of the ways and means to achieve the desired objectives with the appropriate roles.

The basic elements that contribute to a good system of internal accounting control and management of customers are:

- An appropriate organization plan that allows a proper allocation of authority and responsibility among departments, officers, and employees, establishing the necessary segregation of duties for each one.
- Integrated policies and procedures that take into account the roles of all sectors of the organization, taking into account management of users.
- Staff whose knowledge and skills match the duties and responsibilities assigned.
- Proper implementation of the procedures prescribed by the administration after a careful study of the objectives pursued.
- Understanding the importance of internal accounting control for each person concerned and understanding of the part it plays in obtaining the desired protection.
- Monitoring the efficiency of procedures by those responsible for protecting the interests of the institution through continuous review, critical review by internal auditors, or by other means.

Different contexts are established by the internal control elements on which they operate. These are:

- Verification systems of accounting efficiency and administrative control, in order to make sure existing legislation pertaining to that institution is applied correctly.
- Assisting the management over the processes developed in order to act in real time, identifying deviations, fixes proposed, and development activities undertaken in the core areas of that respective institution. This will eliminate process breaks down and prevent bottlenecks in achieving the mission.
- Operational control in order to assess policies and procedures related to operational areas, projects, activities or segments. The management process would include feedback regarding efficiency, effectiveness and suggestions for improving the overall administration, procedures, and controls in order to increase accountability of area managers.
- Control of accounting should include the examination of records and documents, data collection, and validation by means of specific procedures relevant to each institution assets.
- The area of internal control should perform this task and all actions that are triggered in the institution, making it possible to anticipate abnormal situations and perform the necessary corrections.
- The control function over the obligations arising from other institutions.

Effective and efficient work performance requires:

- Integration with the monitoring system, monitoring and control of the internal management of all areas to record the progress of projects undertaken, compliance with regulations and standards that are associated with each activity.
- Maintaining an interface with the system of information exchange that would track and record the timely fulfillment of obligations and take appropriate action.
- Monitoring and interacting with institutions for the control of illegal land appropriation, primarily to prevent such illegal actions.
- Reporting events; in cases where suspicions are confirmed, reporting data to the control entities.

6.1.5 HUMAN RESOURCE SYSTEM

The general model includes system access control of human resources. Although there are no difficulties in terms of capturing personnel data, such data is presently not recorded. Despite of this, it is considered important to have a human resource management system, integrating the recognition of the entry and exit of personnel for the purposes of counting the hours to a list.

- A system that performs the staff payroll which is integrated with the financial accounting management system. Therefore the system must be integrated into the administrative system and accounting records necessary elements that are derived from the payroll for financial accounting purposes.
- A system for human resource management that addresses the management of resumes, ongoing assessment of human resources, training courses that are being accessed, and elements of evaluation.

6.1.6 SYSTEM BUSINESS INTELLIGENCE AND BALANCED SCORECARD

The aim of the system of business intelligence and Balanced Scorecard is to serve as a tool for generating efficient, reliable, and timely indicators of necessary historical information and management (statistics) for sound decision-making and development of policies and standards development of the institutions.

The system should be able to integrate in a comprehensive and automatic manner all the necessary information from the very beginning, with a high degree of certainty and speed. Moreover, monitoring shall be undertaken to guide strategic planning within each institution to project the political strategic level.

In order to improve the Land Management System processes continuously, the system must allow easy access to database information, manage and allow each institution to measure success, and make informed decisions.

6.1.7 ANALYZE STRATEGIC INFORMATION

The analysis of information should give users and management the power to use the critical information with success. The types of access and analysis of information required may vary greatly between different types of users and will provide to the top management crucial information for taking decisions. Managers of other areas must not only have access to different sets of data, but must be willing to analyze this information for different purposes.

6.1.8 PROVISION OF DIFFERENT TYPES OF ANALYSES

The system should provide a complete analysis of the information to enable users to analyze data in various ways, enabling them to anticipate trends and assess the operational management hypothesis. The analysis should promote effective management and proactive decision-making needed to take advantage of future opportunities.

As the market adapts to a changing and competitive environment, capacity demands change dramatically, causing small isolated projects to become immense. Such changes require a solution for the analysis of information that is flexible and scalable to meet the needs of the organization throughout its lifecycle.

Business intelligence technology alone is not enough. It requires a comprehensive solution that includes services and support to ensure a rapid return on investment.

6.1.9 EXECUTIVE ALERTS

Executive alerts are one of the components that must be integrated and that are easy to use. They should allow managers to monitor quickly and graphically the Key Performance Indicators (KPIs). A quick visual presentation provides immediate information. As with the other modules, the user should be able to explore the alerts interactively by clicking on the graph to view subgroups and specific constituents. This capability is essential to provide managers the appropriate level of detail to answer specific questions that may arise in management development.

6.1.10 REPORT MANAGEMENT

The report generator should provide full functionality to the user along with a sophisticated ability to produce mixed reports that include data, graphics, headings, subtotals at multiple levels, “bitmaps,” and other multimedia objects. It should allow quick and easy formatting of detailed groupings, hierarchical structures, dynamic cross tabulations, and diagrams of monitoring reports of the process executions.

Additionally, the reports on cube structures and interfaces closely integrated into an application are to be scheduled for execution on the server and published on an Intranet – Internet, either manually and/or automatically.

6.1.11 GRAPHICAL QUERY

The graphical query system should provide ad hoc data. The users must dynamically search through the data to explore and analyze information. This ad hoc analysis will allow users to discover and understand trends that may be hidden in the data.

The graphic analysis system should allow users to observe a graphical and numerical analysis of its operations which are detailed in the areas of interest. It should also create informative visual reports which may include an unlimited number of headers and footers, aggregates, color coding conditional the ability to expand and dissolve in an interactive data-level details.

Users must have excellent control over the graphical results with the added ability to insert “bitmaps” and the flexibility to navigate through information truly interactive and ad hoc.

6.1.12 BALANCED SCORECARD

After consolidating the information from the institution, it can integrate a BSC that allows for the measurement of strategic objectives, verifying the integrated management of the institution establish a map of relationships cause and effect between the business areas and provide a focus anticipating possible situations in that environment.

6.1.13 DATA MINING

In the case of business intelligence tool one should consider implicitly the scheme of data mining to improve the performance of business processes, which handles large volumes of information that is structured and stored in databases.

For example, data mining is used successfully in applications for the control of production processes as a tool for planning and assessing decision outcomes. This analysis and discovery tool extracts knowledge from data observations.

The steps for conducting a data mining project are always the same regardless of the specific technique used to extract knowledge. Data mining is essential and will allow for training in systems analysis and design in the analysis and exploitation of knowledge implicit in large volumes of data.

6.1.14 ADMINISTRATIVE MANAGEMENT SYSTEM FINANCIAL ACCOUNTING (ERP)

This includes integration with operations performed, generation of reports account extracts and products by different criteria, as well as administrative permit detailed broken down by cost.

7.0 SPECIFIC TECNOLOGICAL MODEL FOR THE INSTITUTIONS

This model describes the structures of institutions involved, including the organizational structure and enhancements necessary to achieve their goals. The specific models are based on the general model including characteristics of the core business layer (operational systems), considering the required modules in accordance with the goals and activities to be performed by each institution. In the next section we analyze the technical departments that are related to land management.

7.1 AGCHO GENERAL DEPARTMENT OF GEODESY & CARTOGRAPHY

The core business is supported by the General Department of Geodesy and Cartography under which are established five departments with specific functions:

- Department of Meta-Data and Services Delivery to Customers;
- Department of Geodesy;
- Department of Cadastre Survey;
- Department of Mapping and Topography; and
- Department of Large Scale Mapping.

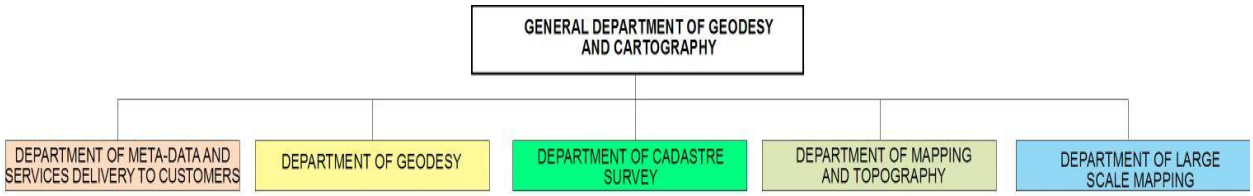


CHART 1

In the next steps, we will describe the functions, processes, and activities of these departments.

7.2 DEPARTMENT OF META-DATA AND SERVICES DELIVERY TO CUSTOMERS

Chart 2 presents the Department of Meta-Data and Services Delivery to Customers and their organizational structure.

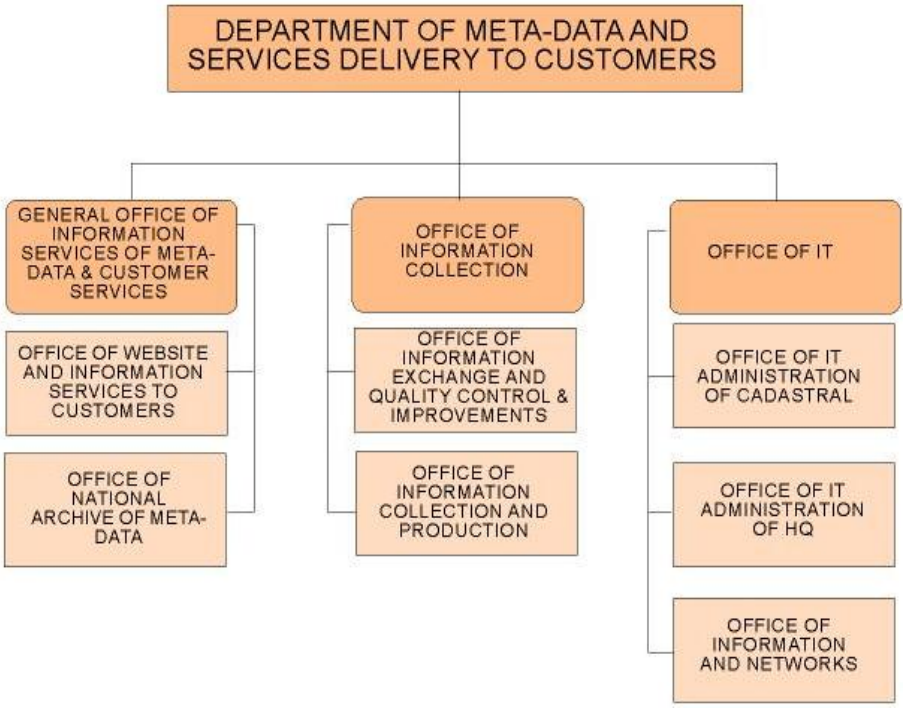


CHART 2

7.2.1 MAIN FUNCTIONS AND DUTIES

- The Department Meta-Data and Services Delivery to Customers is responsible for the data collection, data standardization, sharing information with users, Global Positioning System (GPS) registering, and classification and distribution interchange information with the internal departments and divisions.

7.2.2 ACTIVITIES & PROCESSES

- Provide meta-data information services, customer service, and GPS registering.
- Maintain management of http://www.agcho.org and user interest and feedback, and benchmarking.
- Maintain physical and database archive and product distribution for:
  - Thematic mapping;
  - Atlas;
  - Geographic maps; and
  - Others.

- Plan, collect, and exchange information; quality control and improvements; plan new cartographic needs; and conduct internal and external training.
- Collect data for Afghanistan Spatial Data Infrastructure (ASFDI), special maps, atlases, encyclopedias, and documental databases.
- Facilitate cadastral data digitalization (with data received from the Cadastre Department) of information collected in field interventions, and apply to the Geographic Information Systems (GIS).
- Provide hardware maintenance for network and institutional systems.
- Provide system software maintenance (anti-virus, program actualization, installation of new software, etc.), network maintenance, server software maintenance, and PC maintenance.
- Provide Office of IT Administration of the HQ, providing services and consumables to different departments.

7.3 DEPARTMENT OF GEODESY

Chart 3 presents the Department of Geodesy and its organizational structure.

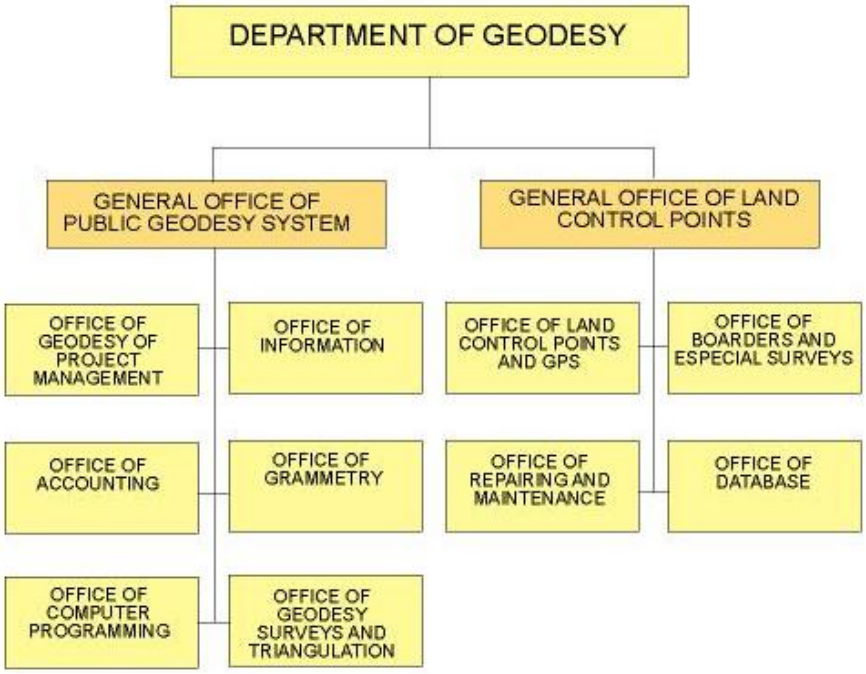


CHART 3

7.3.1 MAIN FUNCTIONS AND DUTIES

- This department is responsible for creating the Geodesy network, establishing the Elevation Network, creating land topography contours, solving boundary problems with other countries, monitoring Gravimetric earth information, and maintaining measurement equipment.

7.3.2 ACTIVITIES & PROCESSES

- Establish eight permanent GPS Continuously Operating Reference Stations (CORS) in eight provinces in Afghanistan. These CORS will work 24 hours/day and can be uses as reference stations.
- Establish the first-, second-, and third-degree geodetic network with GPS and with World Geodetic System (WGS) coordinate system and ellipsoids all over the country.
- Complete first- and second-degree elevation network and after expansion of third- and fourth-degree elevation network all over the country and connect this network with neighboring country elevation systems.
- Complete previous gravimetric network and expansion to other next steps.
- Check and control real gravity of the earth, gravimetric observation by cooperation with the United Nations.
- Create a national polygon of gravimetric measurements.
- Establish a dynamic geodetic network to prevent the loss of human life during earthquakes and landslides. First establishment should be in active earthquake and fault areas and then at places needed in the country.

7.4 DEPARTMENT OF CADASTRE SURVEY

Chart 4 presents the Department of Cadastre Survey and its organizational structure.

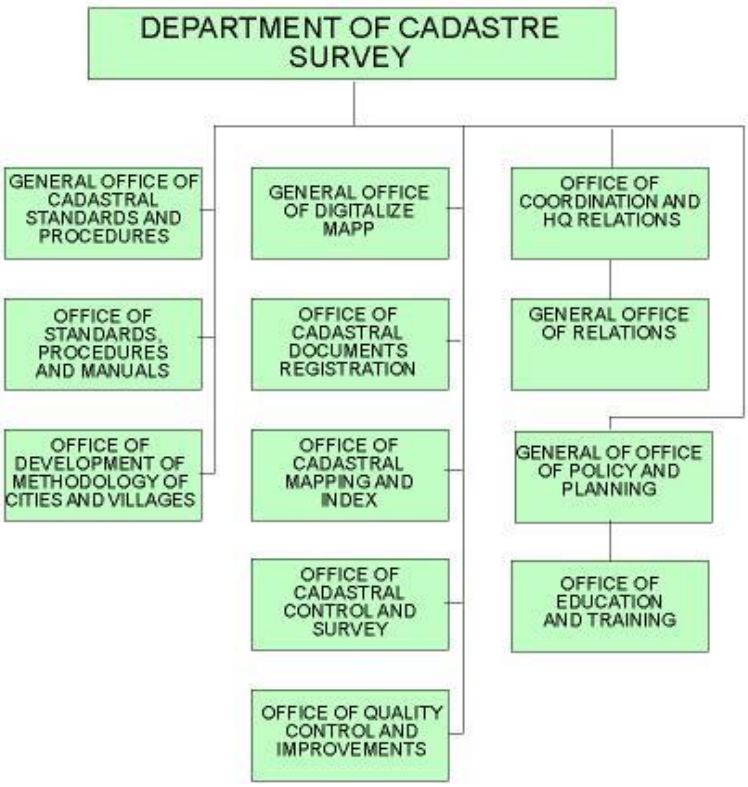


CHART 4

7.4.1 MAIN FUNCTIONS AND DUTIES

- The Department is responsible for creating cadastral information, collecting information for the cadastral survey, maintaining actualized cadastre information, providing detailed information for government and private institutions in land management, establishing a training plan for cadastre professionals, and supporting other institution in land survey.

7.4.2 ACTIVITIES & PROCESSES

- Provide special services required by governmental and private institution and public sector.
- Coordinate internal training for cadastral professionals.
- Maintain cadastre survey information of digitalized maps and registering associated land information.
- Index cadastral imaging information and number each map.
- Provide standards of procedures and manuals for the different offices of the Cadastral Department.
- Develop the methodology for producing maps of cities and villages of identified areas in municipalities, districts, and special developments for MUDA.
- Monitor quality control and improvements in land management and cadastre information at the national level in the provincial offices.
- Manage administrative requirements and relations.

7.5 DEPARTMENT OF MAPPING AND TOPOGRAPHY

Chart 5 presents the Department of Mapping and Topography and its organizational structure:

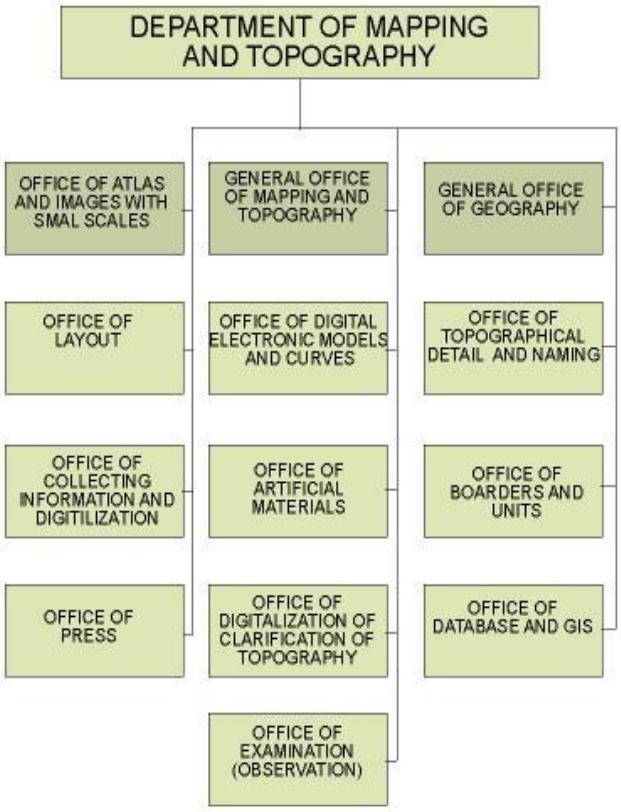


CHART 5

7.5.1 MAIN FUNCTIONS AND DUTIES

The department is responsible for producing and digitizing small-scale images and preparing layouts for special publications; generating mapping, topography, and digital elevation model and contours; satellite image processing and digitalization of topographic information; examining and controlling topographic information; definition; topographical detail naming transliteration; and relation and geographical databases.

7.5.2 ACTIVITIES & PROCESSES

- Prepare special layouts of small-scale images and collect associated information; digitalize and produce publications.
- Generate topographic maps and applied digital elevation models and contours.
- Process satellite imagery and digitization of topographic information.
- Examine and control the result of topographic information applied.
- Establish the naming transliteration of topographic maps according to international best practices.
- Maintain and actualize the alphanumerical and geographic databases of topographic information.

7.6 DEPARTMENT OF LARGE SCALE MAPPING

Chart 6 presents the Department of Mapping and Topography and its organizational structure.

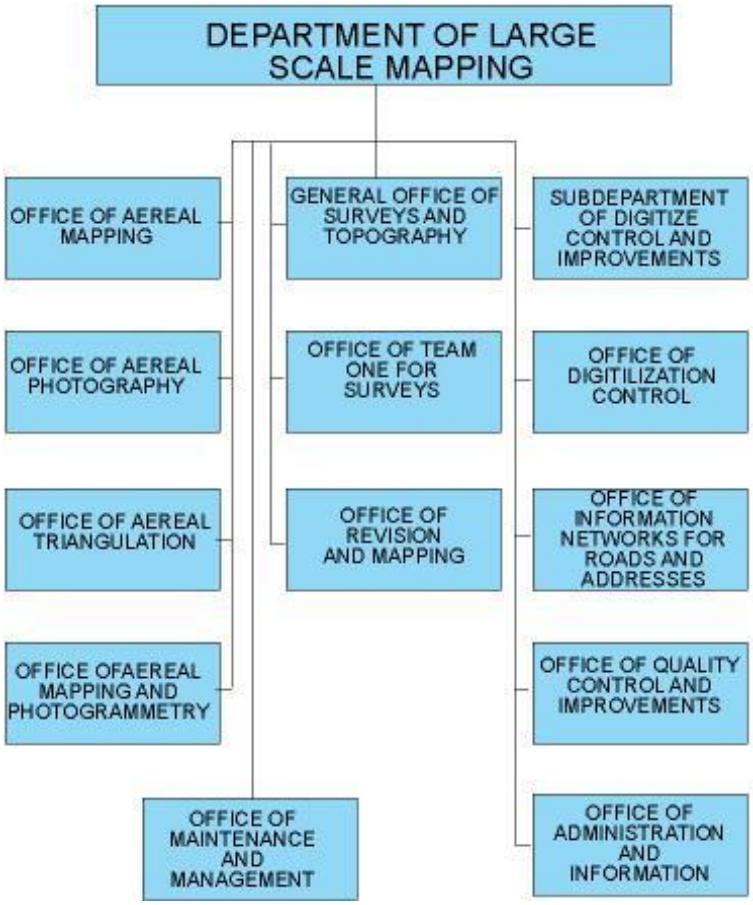


CHART 6

7.6.1 MAIN FUNCTIONS AND DUTIES

The Department is responsible for producing large-scale mapping using aerial photography, triangulation, and photogrammetry; related survey, topography, and mapping revision; controlling and improving digitized data; establishing the road network and street addressing; improving and controlling the quality of large-scale maps; and administering oversight of databases and information.

7.6.2 ACTIVITIES & PROCESSES

- Consolidate information of aerial photography, orthography, and large-scale mapping.
- Establish triangulation and photogrammetry related to digital maps.
- Establish survey data and the topography of large-scale maps and digitize the information.
- Control and revise collected and digitized surveys data.
- Establish road maps and street addresses based on the digitized information.

- Realize quality control and improvements of the information loaded on the GIS.
- Administer and maintain the system information and databases.

7.7 AGCHO TECHNOLOGICAL MODEL

In the specific model for AGCHO, we identified five technical core systems that are directly or indirectly managing data that provide information necessary for the multi-cadastre survey definition (Land Management System)

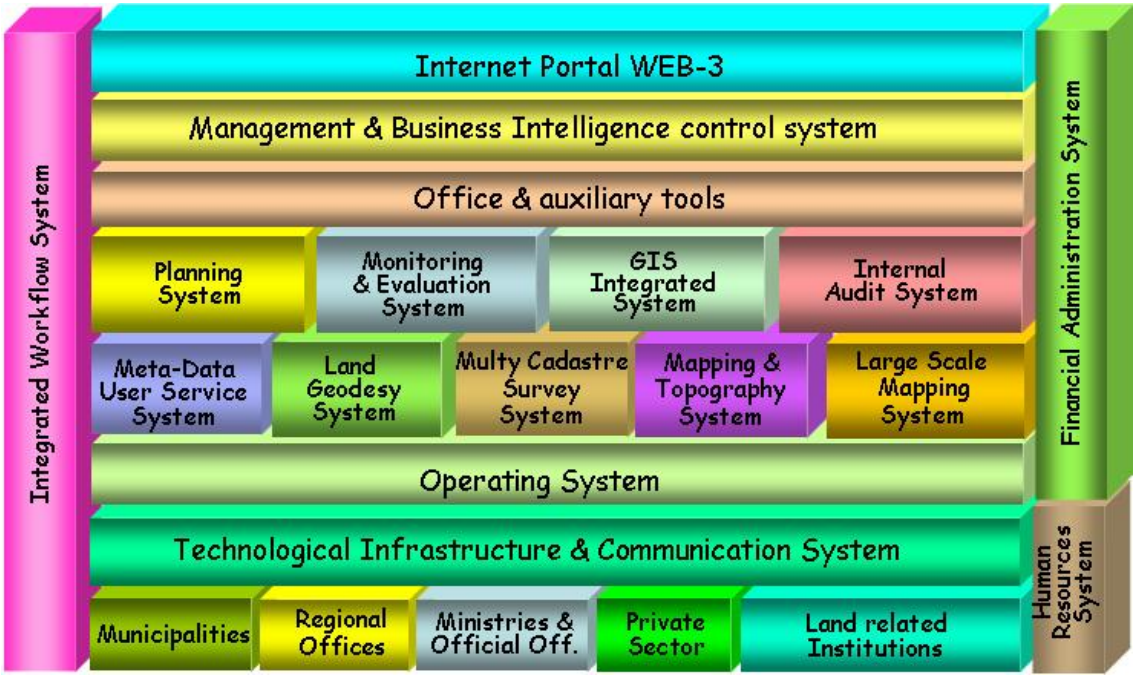


FIGURE 3

These five technical core systems involved in managing data are:

- Meta-data and User Service System;
- Land Geodesy System;
- Multi Cadastre Survey System;
- Mapping and Topography System; and
- Large-Scale Mapping System.

7.7.1 META-DATA AND USER SERVICE SYSTEM

This system will be responsible for allowing interaction with users who require special information or services from the institution, the system register, maintaining the information of all requirements that the respective institution receives, and managing control of pending applications. The system maintains the publication on the Website of all the services that the institutions provide.

The system will facilitate the registration of cadastral information provided by different institution, which then will have to be revised by the Cadastre Department before it can be applied as valid information on the Cadastral System. The system is capable of registering the demand of different information and producing certificates for special purposes.

7.7.2 LAND GEODESY SYSTEM

The information of the Geodesy Information System is very important to provide reference points on land, which allows establishing exact coordinates for specific measurement of land. It also maintains the elevation information; topographic contours; and control of the boundaries, geodetic information, and maps. The system facilitates establishing dynamic formularization of mathematic formulas to realize measurement and monitoring of earth's gravimetric information.

7.7.3 MULTI CADASTRE SURVEY SYSTEM

The Multi Cadastre Survey System is capable of registering the information coming from analyses made by cadastre professionals collecting cadastre survey and related information. It also maintains geographical multi-cadastre information with associated information. The system of AGCHO has the capacity to interact with other systems over VPN (Virtual Private Channels) over Internet working with web-services.

It is important to mention here that AGCHO is the authority who has to certify and to provide other land management-related institutions with additional information such as different layers that can be helpful to see private and public land affected by other restrictions (like natural reservoirs, forestry, mines, technical exceptions, hydrographic restrictions, economic restrictions, planed road, and others).

7.7.4 MAPPING AND TOPOGRAPHY SYSTEM

The main modules of the Mapping and Topographic System are compound by the module for digitization of small-scales images, module for making special layouts for publications, image processing and digitalization of topographic information. The module which supports and provides the aerial images is very important for the consolidation of cadastral survey information. The system also facilitates the generation of topographic mapping, digital elevation model and contours, based on aerial and satellite information.

7.7.5 LARGE SCALE MAPPING SYSTEM

The Large-Scale Mapping System comprises the modules of aerial photography, triangulation and photogrammetry that facilitate related survey and topography. The mapping revision of the system is a module that allows the registering of data for the control and improvements of digitalized data. The module establishes the road network providing large scaling mapping of the road network and others. The module for the quality control of large-scale maps, administration of databases facilitates the quality control and the updating of the information supported by the database.

7.8 ARAZI GENERAL DEPARTMENTS

The core business is supported by the five specific departments:

- Department of Registration and Land Survey;
- Department of Planning and Clearance;
- Department of Property Dispute and Resolution;

- Department of Land Leases; and
- Department of Land Documents.

7.9 GENERAL HEAD OF ARAZI

Chart 7 presents the General Head of Arazi and its organizational structure

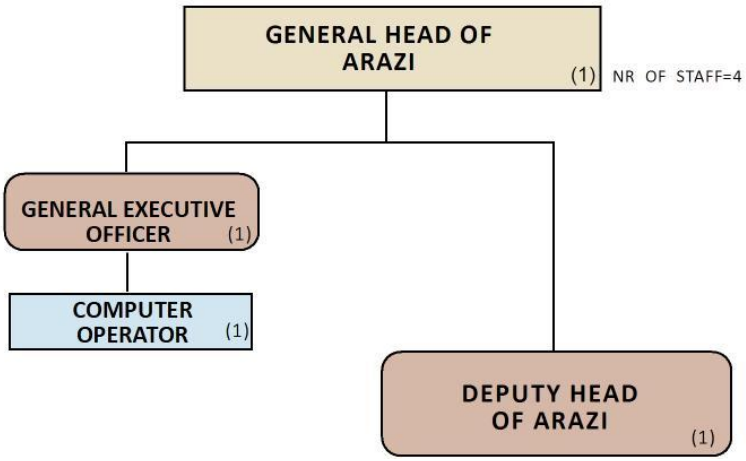


CHART 7

7.9.1 MAIN FUNCTIONS AND DUTIES

- Advise the different Deputy Heads of Arazi Departments, plan and define together strategic actions to be developed.

7.10 GENERAL DEPARTMENT OF REGISTRATION AND LAND SURVEY

Chart 8 presents the General Department of Registration and Land Survey and its organizational structure.

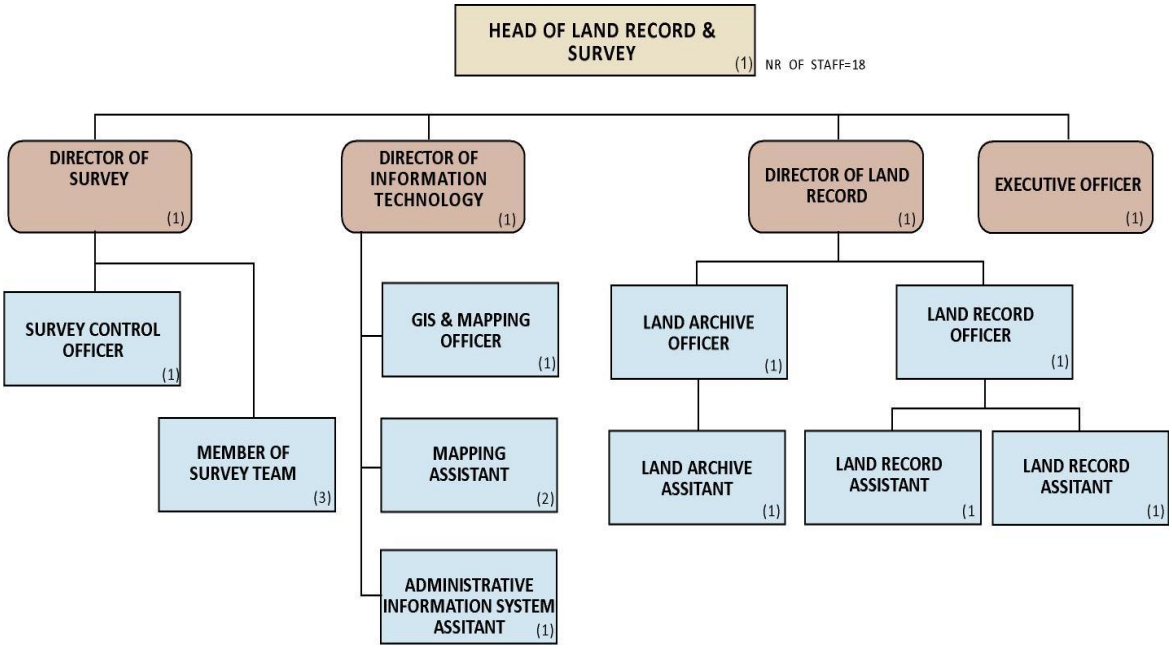


CHART 8

7.10.1 MAIN FUNCTIONS AND DUTIES

- Responsible for identifying and distinguishing of all types of lands, including government land, private land, and individual land, in order to conduct land registration management and survey in a computerized system.

7.10.2 ACTIVITIES & PROCESSES:

- Order, maintain, produce, and manage documents in different provinces and districts as needed.
- Collect and complete land documents and provide information for MAIL.
- Register individual lands after completion of land clearance process of the area and registration of title deeds after completion of the court processes.
- Identify and analyze survey and register 125,000 jiribs (1 jirib = 2,000 m^2) of land annually.
- Map and digitize cadastral maps for the years from 1340–1350 (on the Iranian calendar) and prepare those lands for survey.
- Prepare digital computerized maps of government, individual, and private lands with detailed satellite photos using the standard windows of air.

7.11 DEPARTMENT OF PLANNING AND CLEARANCE

Chart 9 presents the Department of Planning and Land Clearance and its organizational structure.

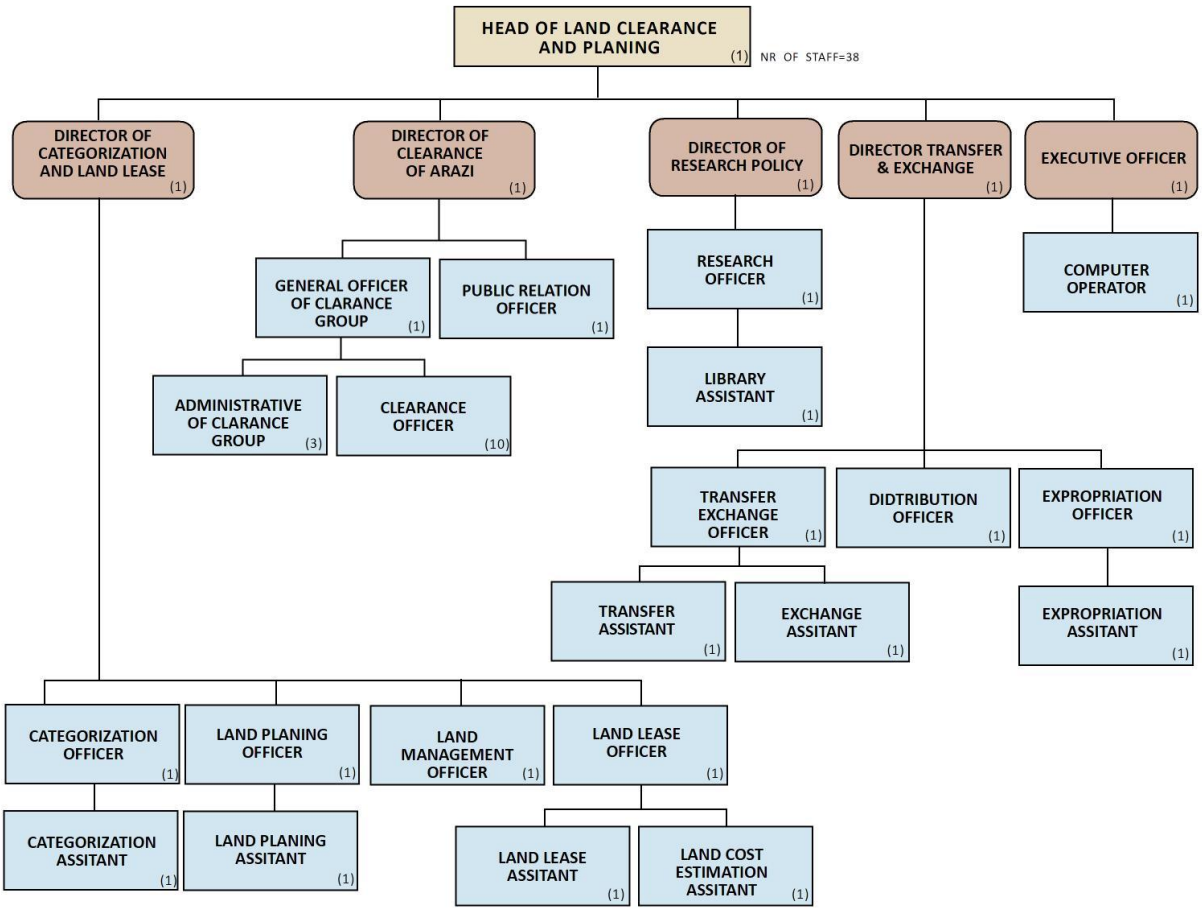


CHART 9

7.11.1 MAIN FUNCTIONS AND DUTIES

The main functions are implementation of a reasonable system and permanent land clearance, planning for uses of land, determining value of land, exchange system for land, and distribution of land in order to promote economic and social development.

7.11.2 ACTIVITIES & PROCESSES

- Clearance of public, private & governmental land.
- Complete transaction exchange and distributing of land.
- Zone land and preparing a Plan for using land.
- The rental value of land (land evaluation and analysis).
- Expropriate Land for the Ministry of Agriculture Irrigation and Livestock (MAIL) projects.
- Improvements to land in order to attract more investors.
- Conduct better interpretation of laws related to land management regulations and procedures.
- Analyze and evaluate economic rent for clearance and land use Plan.

- Conduct regional research on land related issues in order to promote transparent and effective policies.

7.12 PROPERTY DISPUTE AND RESOLUTION DEPARTMENT

Chart 10 presents the Property Dispute and Resolution Department and its organizational structure.

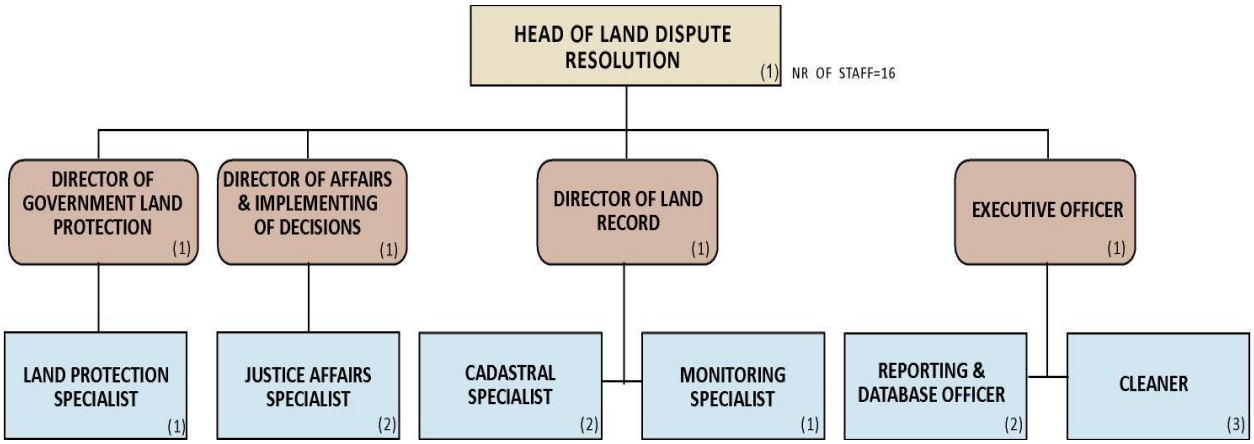


CHART 10

7.12.1 MAIN FUNCTIONS AND DUTIES

- Responsible for finding out alternative solutions for land related disputes and preventing Land from the illegal grabbing and proposing the grabbed Land issues to the relevant institutions of the government.

7.12.2 ACTIVITIES & PROCESSES

- Conduct conflict resolution and prevention of property ownership and restitution of usurped land.
- Collect reliable and comprehensive information on property usurped.
- Provide the final analysis based on collected evidence.
- Provide final analysis to the board leadership for making decisions.
- Close supervision on ground maintenance of specified areas.
- Monitor to make sure the restitution process of the properties and to prevent future usurpation on central and provincial level.
- Ensure cooperation and coordination between relevant agencies and local communities relevant for the protection of the land restitution.
- Send the results to the authorities of the judicial Department.
- Following the expulsion of illegal occupancy based on the board legal decision.
- Pursue the prosecution of illegal appropriation of Land.

- Monitor the implementation process of property restitution of land that has been usurped.
- Submit a request thru Ministry of Justice (of government cases department) to appeal against the court decision.
- Follow up on unresolved cases of previous usurped property.
- Dialogue with potential usurpers, as well as arbitration
- Careful assessment and analysis of documents based on facts and existed evidences.

7.13 DEPARTMENT OF LAND LEASES

Chart 11 presents the Head of Land Lease and its organizational structure.

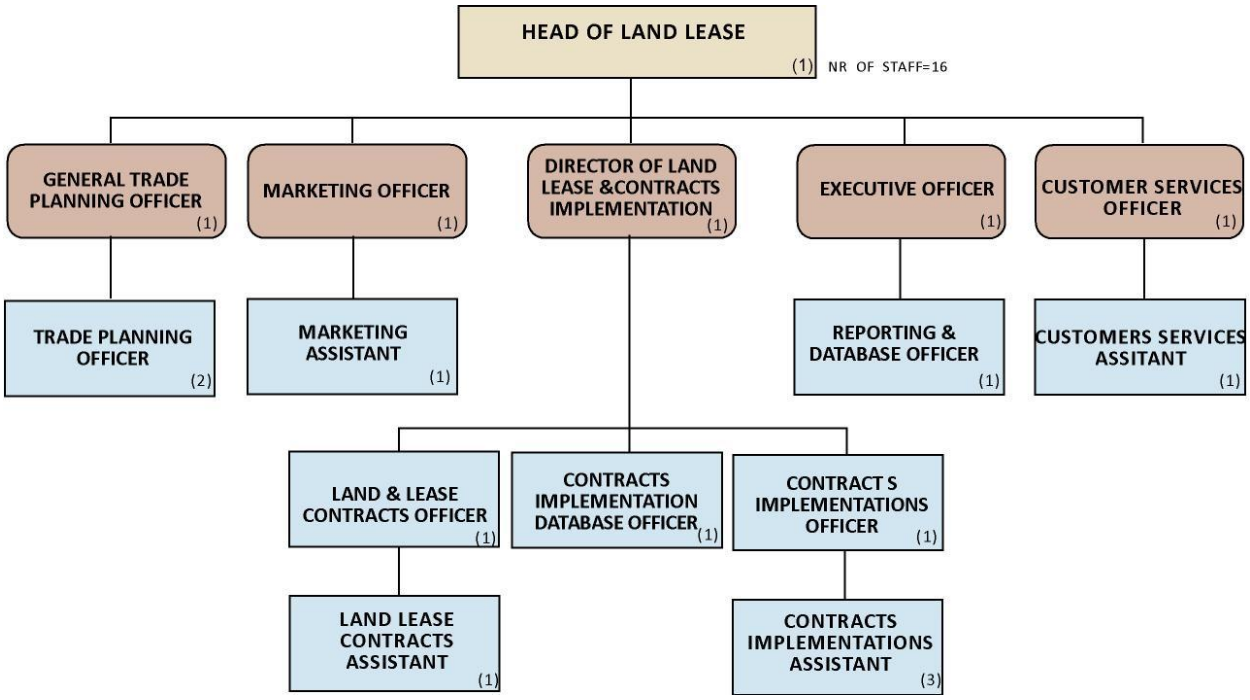


CHART 11

7.13.1 MAIN FUNCTIONS AND DUTIES

Responsible for establishing a united system in order to encourage investment and promotion of Government land Strategy through a simple process and creation of a modern system for controlling of all the land lease contracts and agreements on government-owned lands.

7.13.2 ACTIVITIES & PROCESSES:

- Leasing at least 25,000 jiribs of governmental land annually (open bid campaigns).
- Providing effective services for Plans in order to develop Business Plans.
- Assistance and guidance to customers on their land-related issues

- Producing mechanism to evaluate the Business Plans from applicants.
- Controlling and evaluation of investor activities related to their Business Plan.
- Registration of all conflicts in a single data base.
- Market to investors during meetings and exhibitions.
- Providing reports for the land leases revenue.

7.14 DEPARTMENT OF LAND DOCUMENTS

Chart 12 presents the Head of Analysis and Documentation and its organizational structure.

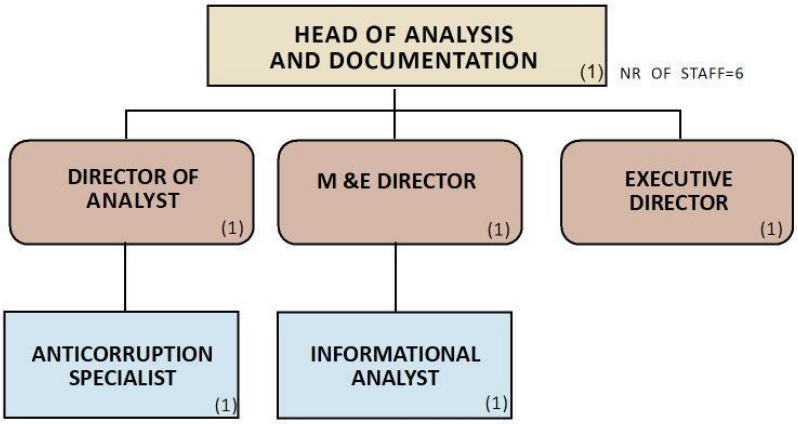


CHART 12

7.14.1 MAIN FUNCTIONS AND DUTIES

- Responsible for providing the information of documents, witness, reports in order to provide effective recommendations for the decision makers of Arazi.
- Receiving the standardization conformation letter of United Nations [ISO9000].
- Preventing administration corruption.
- Preparation of standardized procedures for all departments of Arazi.
- Monitoring and Evaluation of operational headquarters as well as the provincial offices of Arazi.

7.14.2 ACTIVITIES & PROCESSES

- Create a modern and efficient system to evaluate and control the affairs and establish indicators for all activities.
- Evaluating the land property documents for compliance with the country law and regulations.
- Conservation and efficient use of assist management.
- Purpose proposal for administration reform and failures.
- Corruption prevention-finding the cause and condition of corruption and misappropriating.

- Careful risk management (financial, operational and strategic types of risk).
- Inspection of central and regional offices without advance notice.
- Providing information to the MAIL audit committee and the department of control and audit committee of other ministries and authorities.

7.15 ARAZI TECHNOLOGICAL MODEL

In the specific model for Arazi we identified five core systems that fall under the survey definition (Land Management System)

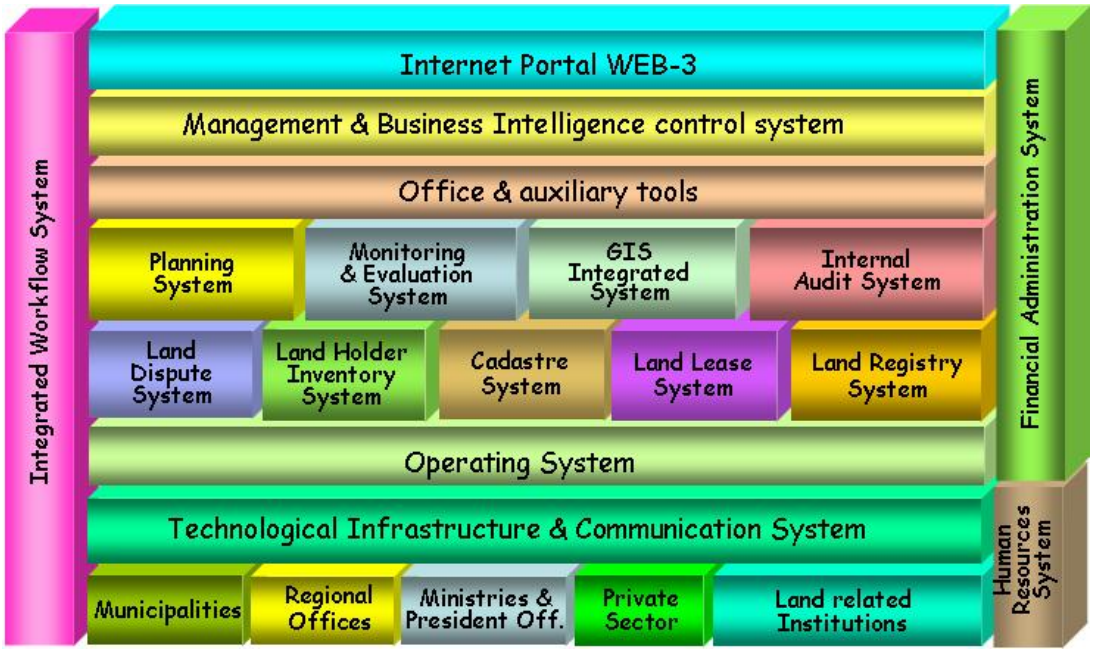


FIGURE 4

- Land Registry System;
- Land Planning, Clearance and Lease System;
- Land Cadastre System;
- Land Holder Inventory and Documental System; and
- Land Property Dispute and Resolution System.

7.15.1 LAND REGISTRY SYSTEM

The Land Registry System allows the registering of all types of lands including Government land, private land and individual land in order to undertake land registration management in a computerized system.

7.15.2 LAND PLANNING, CLEARANCE AND LEASE SYSTEM

The Land Planning, Clearance and Lease modules are meant to encourage investment and promotion of Government's land strategy. The Module of Land Planning and the Module of Land Clearance determine

the value of land supported by a modern system for controlling of all the land lease contracts which are supported by the Module of Land Lease. The system integrates all these modules by allowing the agreements distribution of government Land in order to promote economic and social growth.

7.15.3 LAND CADASTRE SYSTEM

The system is capable of registering the information coming from the analysis made by the cadastre professionals in the field getting cadastral survey related information. It is also capable of maintaining geographical multi-cadastre and associated information.

The system provides a strong connection to AGCHO over VPN (Virtual Private Channels) over Internet working with Web-services, it is important to mention at this point that AGCHO is the authority that has to certify and provide to the other institution who are involved in Land management with additional information such as different layers that can be useful for the previous analysis before determining the Titling to the land owners to see affected private and public land by other restriction like natural reservoir, Forestry, Mines, technical exceptions, Hydrographic restrictions, Economic restrictions, planned road, and others matters.

7.15.4 LAND HOLDER INVENTORY AND DOCUMENTAL SYSTEM

The Land Holder Inventory System maintains a consolidated land inventory with all relevant documents. The system allows the production of reports in chronological order, comparing the information with the information from the different System modules.

This system allows for the Monitoring and Evaluation of operational areas of the headquarter as well as provincial offices of Arazi, as well as better control in order to prevent administration corruption.

7.15.5 LAND PROPERTY DISPUTE AND RESOLUTION SYSTEM

The Land Property Dispute and Resolution System registers information about land holder disputes and explores alternative solutions for related land disputes. It also prevents land grabbing and forwards land grabbing issues to the relevant government institutions.

The system recovers all the information to the related land in dispute from the Land Holder Inventory and Document System.

8.0 MUDA GENERAL DEPARTMENTS

8.1 MINISTER OF URBAN DEVELOPMENT

Chart 13 presents the Head Staff of Minister of Urban Development and its organizational structure.

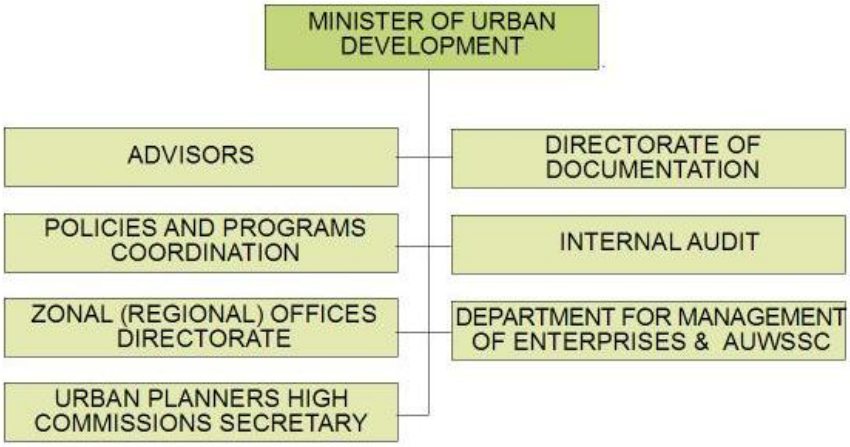


CHART 13

8.2 DEPARTMENT OF FINANCE

Chart 14 presents the Department of Finance and Administration and its organizational structure.

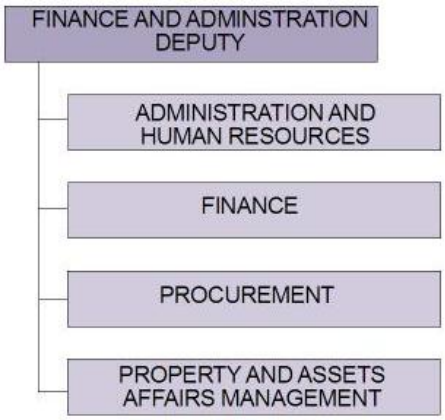


CHART 14

The Goals, Activities & Processes are supported by the ERP developed by MUDA IT personnel.

8.3 TECHNICAL DEPARTMENTS OF URBAN DEVELOPMENT

Chart 15 presents the Deputy Departments of Urban Development and its organizational structure.

CHART 15

8.4 TECHNICAL DEPARTMENT OF CONSTRUCTION AFFAIRS

Chart 16 presents the Department of Construction Affairs and its organizational structure.

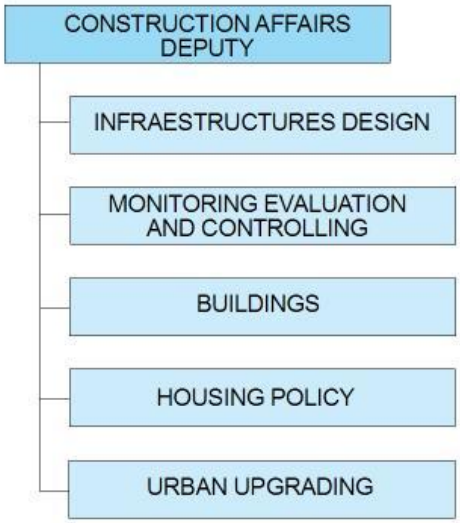


CHART 16

8.4.1 MAIN FUNCTIONS AND DUTIES

It is responsible for providing the information of governmental building infrastructure design; for monitoring & evaluation of buildings under construction and for the control on general construction regulation. It also maintains a database of all official buildings. In order to provide good public services to citizens, functioning Government offices need to be established in provincial cities. With regards to the development and housing policy it is responsible for programming all urban development activities and urban infrastructure upgrading.

8.4.2 ACTIVITIES & PROCESSES

- Regularization of informal settlements with appropriate security of tenure.
- Promoting balanced development in 34 provinces.
- Preparation of Strategic Plans for each city to replace the Master Plan to generate urban growth.
- Provision of new serviced land to landless families.
- Establishing an alarm event management system.
- Stimulate the economy by strengthening the urban centers as catalysts for commercial growth.
- Strengthen the weak local private sector in order to deliver housing and jobs.
- Ensuring that the extension of basic services is based on affordable operation and maintenance costs.
- Establishing hygienic systems of sanitation, noting technical feasibility and cost.
- Establishing a sound system for solid waste management that is affordable to local authorities.
- Strengthening the municipal revenue base in order to promote self-sufficiency.
- Promoting transparent and accountable local governance.

8.5 TECHNICAL DEPARTMENTS OF URBAN AFFAIRS

Chart 17 presents the Deputy Departments of Urban Development and its organizational structure.

CHART 17

8.5.1 MAIN FUNCTIONS AND DUTIES

The Urban Affairs Deputy is responsible for the physical development of urban land with special emphasis on sites & services development for housing and associated technical mechanisms (such as town planning, land registration and transfer, cadastral mapping). That will increase the supply of serviced land in urban areas.

It is also responsible for strengthening the links with the urban heritage through the conservation of historic buildings and areas, retaining their essential character while finding vital roles that can sustain urban activities.

The department is also tasked with the improvement and expansion of main infrastructure networks and services to standards commensurate with the availability of resources, as well as with strengthening the operating agencies to ensure effective and efficient service delivery. Its duties also include the improvement and expansion of primary and secondary water supply networks, and implementation of effective mechanisms for the waste disposal.

8.5.2 ACTIVITIES & PROCESSES

- Provide improvement of water supply systems in all cities considering possible rehabilitation and expansion of current networks
- Develop plans to increase the first level of basic sanitary services and improve hospitals infrastructure that assist the second, third and fourth level to attend the society.
- Generation of significant improvements of urban roads, and the additional efforts to facilitate people the access to homes and markets.
- Monitoring the rapid increase of the number of commercial and private vehicles in Kabul.
- Executing measurements in order to control traffic to develop action plans and ensure a better flow.
- Planning of new roads and establishing and maintaining the cadastre of roads network in accordance with cartography and the technical support provided by AGCHO.

8.6 MUDA TECHNOLOGICAL MODEL

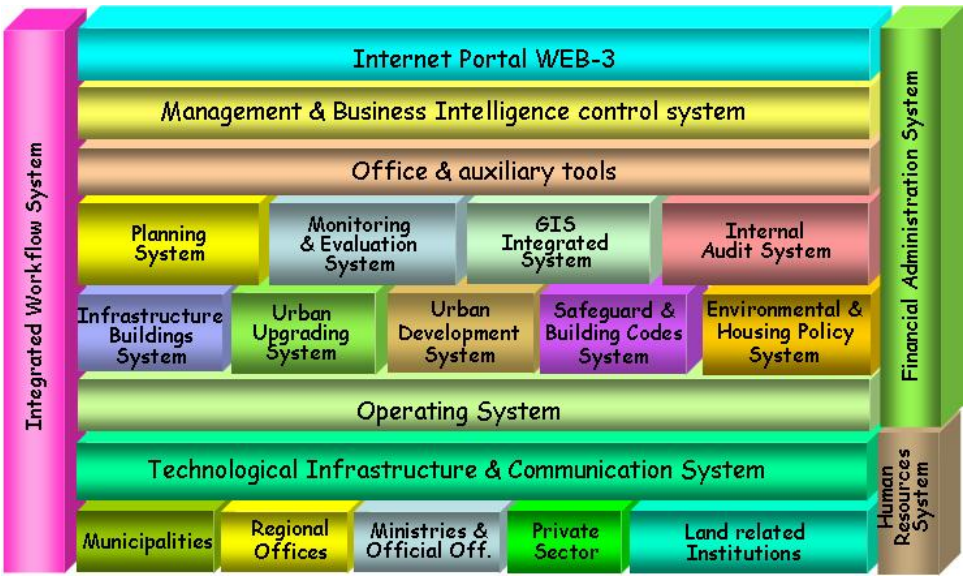


FIGURE 5

- Buildings Infrastructure System;
- Urban Upgrading System;

- Urban Development System;
- Safeguard and Building Codes System; and
- Environmental and Housing Policy System.

8.6.1 BUILDINGS INFRASTRUCTURE SYSTEM

The system supports the information on a database of the infrastructure of governmental buildings and also some private buildings. The system also facilitates the improvement, expansion and maintenance of main infrastructure and services to standards commensurate with the availability of resources of MUDA.

8.6.2 URBAN UPGRADING SYSTEM

Due to the increase in the number of demands for services the upgrading system will also provide statistical information able to prioritize the development of action plans. This will facilitate the upgrade of various services or new initiatives aimed to improve the living standards in cities. The system allows the monitoring of upgrading and renovation projects and provides information for decision making.

8.6.3 URBAN DEVELOPMENT SYSTEM

This system facilitates the planning of development projects to be carried out locally and nationally, including the creation of new roads, improving hospitals infrastructure and basic sanitation, as well as water, electricity and cleaning services in the affected areas. It also allows the control and audit of new development or projects in execution. The system maintains a rural land cadastre, and also geographic information for the different services already established or to be established.

8.6.4 SAFEGUARD AND BUILDING CODES SYSTEM

This system maintains for the building codes with the urban heritage through the conservation of historic buildings and areas, retaining their essential character while finding vital roles that can sustain urban activities.

8.6.5 ENVIRONMENTAL AND HOUSING POLICY SYSTEM

The system records housing in city areas as well as policies that apply in rural areas, in accordance with a master plan that considers environmental and specific characteristics of those areas. These metrics are applied to achieve a balance in the entire urban context.

9.0 IDLG/GDMA GENERAL DEPARTMENTS

9.1 MAIN FUNCTIONS AND DUTIES

IDLG is a newly established organization and responsible for local governance and all the provincial governors and mayors are under their direct management except Kabul. IDLG proposes provincial governors and mayors and also responsible for district level governance. IDLG through GDMA is responsible for the oversight of 153 municipalities in the country. IDLG has two main General Directorates:

- ADMINISTRATION Directorate- responsible for the general administration and organization of provincial and district governor offices and municipalities.
- POLICY Directorate -responsible for the Sub-national Governance Policy and all other related subjects. GDMA is under the policy DG. DGMA is to oversee, manage and regulate the affairs of all municipalities of Afghanistan, except Kabul. GDMA is the hub of the municipalities and it has the responsibilities of municipal land and that is why it has been included in the IT Strategic Plan.

Chart 18 presents the Organization of the IDLG General Directorates

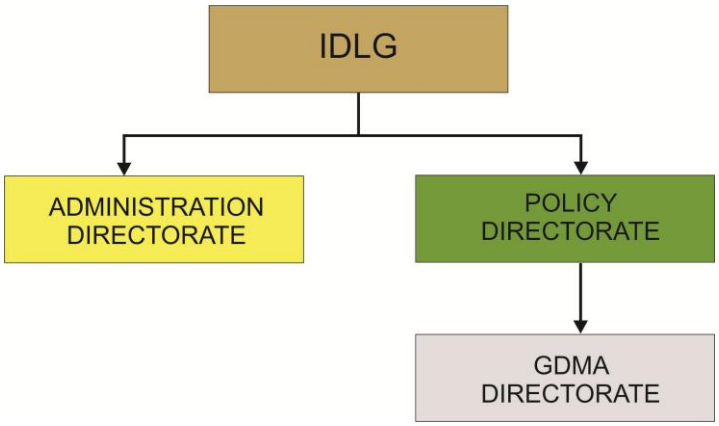


CHART 18

GENERAL ORGANIZATION STRUCTURE OF GDMA DEPARTMENTS

The core business is supported by the five Departments:

- Department of Revenue policy;
- Department of Administration & Finance;

- Department of Urban Services;
- Department of Strategic Planning & Urban Development; and
- Department of Economic Development.

Chart 19 presents the Organization of the General Directorate of Municipal Affairs (GDMA)

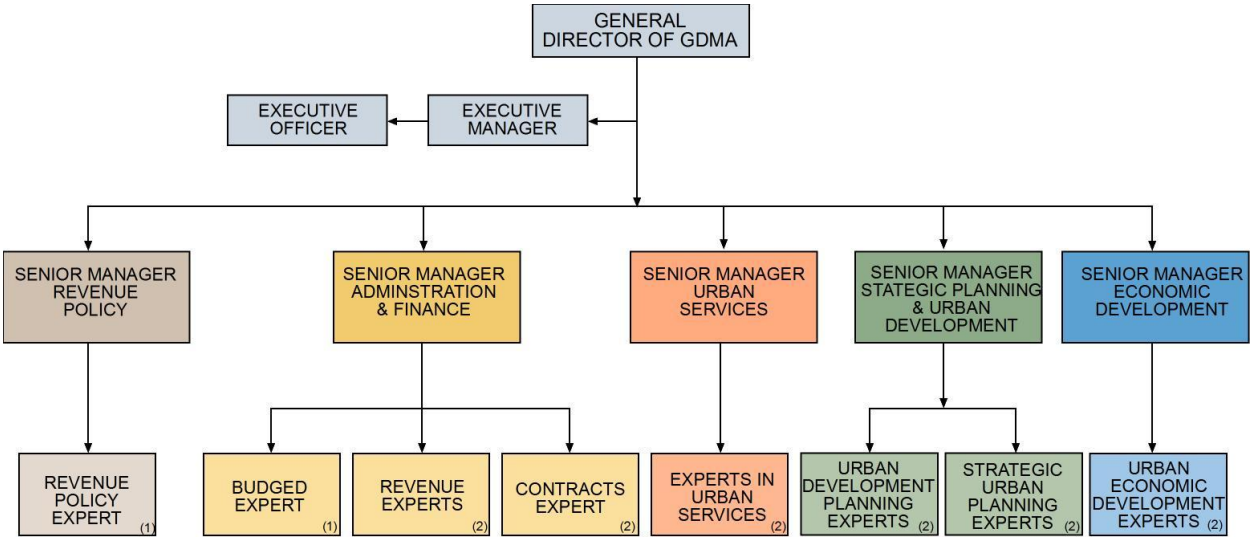


CHART 19

9.2 GENERAL DEPARTMENT OF REVENUE POLICY

Chart 20 presents the organization of the Department of Revenue Policy of the General Directorate of Municipal Affairs (GDMA)

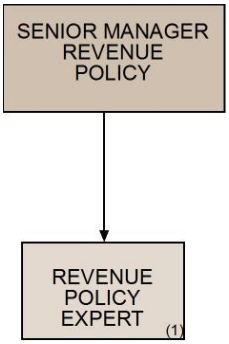


CHART 20

9.2.1 MAIN FUNCTIONS AND DUTIES

The department is responsible to create policies to support initiatives for revenue generation.
It is also responsible for the monitoring & evaluation of the execution of approved revenue policies for the municipalities by the Ministry of Finance.

9.2.2 ACTIVITIES & PROCESSES

- Create new revenue policies taking into consideration the local economic conditions and the proposed incoming revenues.
- Revise the existing revenue policy and make appropriate changes based on the existing conditions (deciding on the level of taxes and fees established by the municipalities and subject to regulations by the Government)
- Monitoring the revenues collected by services operations provided by the municipalities.
- Assist the municipalities in establishing a good revenue generation and management supported by a system leading to self-sustainability.

9.3 GENERAL DEPARTMENT OF ADMINISTRATION & FINANCE

Chart 21 presents the organization of the Department of Administration & Finance of the General Directorate of Municipal Affairs (GDMA)

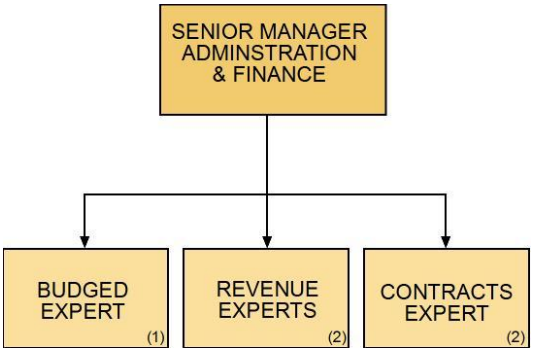


CHART 21

9.3.1 MAIN FUNCTIONS AND DUTIES

The Department of Administration and Finance is responsible to manage a database and a Management System of budget information that was approved for the provinces, districts and municipalities.

The Department also manages a database and a Management System of revenue information generated through public infrastructure such as water supply, drainage, roads, sports facilities, markets and cultural and historical centers, civic centers, parks, housing and commercial complexes, and public transport facilities provided by the provinces, districts and municipalities.

The Department is in charge with the contracts and projects that are in progress and makes sure that project goals are achieved. It manages a database of contract information from the provinces, districts and municipalities.

9.3.2 ACTIVITIES & PROCESSES

- Collect budgetary information to be incorporated into Government budgets; adjusting this information to avoid duplication at the provincial, district and municipal levels
- Collect and analyze information related to the income generated by different services provided to citizens and verify fair application at the provincial, district and municipal levels.
- Collect information on contacts & projects at provincial, district, municipal and sub-national levels.
- Monitor and control of approved budgets, services revenue and contracts in operation, establish KPI's (Key Performance Indicators) to verify if all activities are executed in the established time frame and if they reach the planned goals at the provincial, district, municipal and sub-national levels.
- Update the database and generate reports about the status of undergoing activities.

9.4 GENERAL DEPARTMENT OF URBAN SERVICES

Chart 22 presents the Organization of the department of Urban Services of the General Directorate of Municipal Affairs (GDMA)

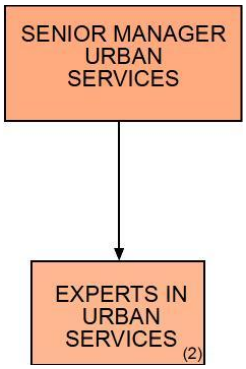


CHART 22

9.4.1 MAIN FUNCTIONS AND DUTIES

The Department of Urban Services is responsible to support and maintain a database and a Management System of services provided at the provincial, district and municipal levels.

The department is also responsible to increase the role of municipalities in providing urban services and facilities to the population. Such services include basic infrastructure and related services to official entities and central agencies (such as agriculture, communication and information technology, infrastructure, trade and business).

The Department is in charge to monitor and supervise the services provided to citizens and make necessary adjustments in terms of quality and cost control

9.4.2 ACTIVITIES & PROCESSES

- Collect and analyze information on various urban services provided to the population and verify fair enforcement at the provincial, district and municipal levels.
- Analyze the needs of implementing new urban services due to the demographic expansion or already identified needs for a better living conditions for the population.
- Monitoring and control of urban services provided to the citizens at the provincial, district and municipal levels.
- Maintain a dashboard panel with indicators regarding the quality of services offered, user satisfaction indicators, timeliness and associated costs.

9.5 GENERAL DEPARTMENT OF STRATEGIC PLANNING & URBAN DEVELOPMENT

Chart 23 presents the Organization of the Department of Strategic Planning & Urban Development of the General Directorate of Municipal Affairs (GDMA)

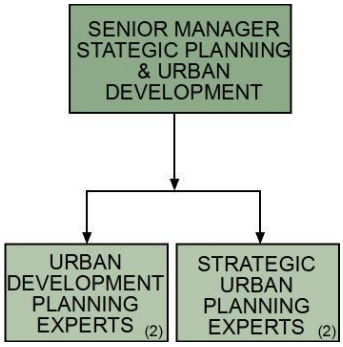


CHART 23

9.5.1 MAIN FUNCTIONS AND DUTIES

The Department is responsible to define and establish the strategic planning and urban development. The Department is ultimately responsible to improve the living conditions of population that would lead to socio-economic growth at provincial, district, municipal and sub-national levels.

The department also aims to increase citizen participation in the Municipal Strategic Planning and Urban Development processes and to improve urban planning and new development strategies.

9.5.2 ACTIVITIES & PROCESSES

- Analyze the projects and programs presented by the provincial, district and the municipal entities and establish the degree of their importance at the sub-national and regional levels and assess their economic impact.

- Decide together with public and private sector institutions possible intervention areas; conduct research on investment costs, and economic benefits citizens at local and national levels.

- Update the database of technical specifications, programs and projects along with relevant studies, as well as strategic plans and urban ddevelopment strategies.

- Generate information for citizens in urban areas and for the authorities involved in drafting the strategic plan, also mentioning the degree of their intervention in the implementation process.

9.6 GENERAL DEPARTMENT OF URBAN ECONOMIC DEVELOPMENT

Chart 24 presents the Organization of the Department of Urban Economic Development of the General Directorate of Municipal Affairs (GDMA)

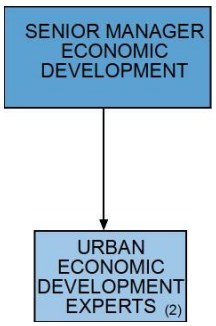


CHART 24

9.6.1 MAIN FUNCTIONS AND DUTIES

The department is responsible to improve the practices regarding economic growth and sustainable social development in order to encourage market-based practices, reduce poverty and improve the living standards for the population.

9.6.2 ACTIVITIES & PROCESSES

- Update urban economic development-related information in the database for the provinces, districts and municipalities.

- Analyze economic development alternatives based on different aspects such as urban conditions, access to basic and higher education, land-related environmental, climate, geographic, fertility and productivity factors, as well as access to water, distribution channels, and communication

- Evaluate possible development programs out of the projects submitted by local authorities and registered in the database.

9.6.3 IDLG TECHNOLOGICAL MODEL

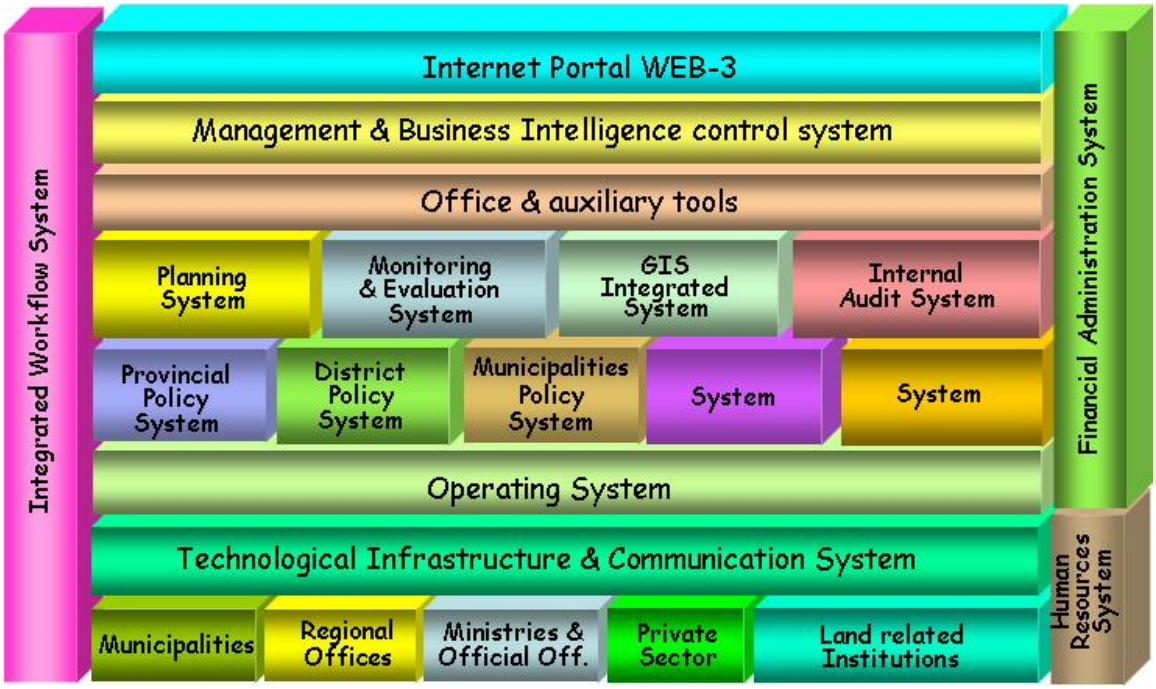


FIGURE 6

10.0 HARDWARE AND SYSTEM SOFTWARE COMPONENTS

It is expected that based on the projections established in the IT Strategic Plan and considering the constant technological progress that the equipment and software platform for the participants of the Land Management System will support the needs of the institutions and will enable them to provide the services in an effective manner.

The traffic volume will increase and will rely on last developments in information exchange among users. Institutions will have a carefully planned infrastructure to ensure a smooth growth and high levels of availability.

The architecture of the solution defined allows a scalable, reliable, secure, and manageable and considers aspects such as:

- Network Devices: Routers, switches and load balancers.
- Computing devices: Servers and work stations.
- Virtualization Services systems making it possible to maintain different systems into one robust platform of processors.
- Storage Devices: Direct-attached storage (DAS), network-attached storage (NAS) and storage area networks (SANs) and clustered systems.
- Firewall devices: Firewalls perimeter, internal firewalls.
- Data Services: Databases engine and other graphical repositories of information.
- Web application services.
- Infrastructure Management Services.
- Services backup and recovery.
- Certificate Services: Public Key Infrastructure (PKI).
- Remote Access Services: Virtual Private Networks (VPNs) and Internet Authentication Service (IAS).
- Integration Services: over Workflow System.

The proposed computational infrastructure takes into account all these elements. As outlined above, servers, firewalls, fiber optic hubs for the formation of a network act as the backbone of servers. It also

takes into account uninterruptible power supplies (UPS) and auxiliary power generators, and other elements that allow the interconnection between the equipment.

In some special cases, the Strategic Plan has considered improving the physical infrastructure and environmental conditioning.

The system architecture and applications for access and information management follow the guidelines of layered architecture: a layer of interface software that interacts with the user for presentation and data collection. The user interface uses the business layer, through Business Objects (BOs) to obtain and update data.

These modules of Business Objects, communicating with the coat of Business Services (BSS) that execute transactions such as communication with the database, performing transactions, maintenance of business rules and interaction with other systems.

The layered architecture allows a controlled scalability to meet the demands that come through the portal and the network and enable organized management of information. These layers are:

- User Interface Layer: As this layer is an island, it must be able to replicate the services the user interface as the Web Portal to grow in demand for new standards is not required to modify the business layer to switch interface user.
- Business Layer: As transactions grow in the Web Portal, they will require growth in this layer as well. Again, the isolation allows for coordinated growth, replicating this layer, meeting the needs of the Web Portal. This isolation must be done both on software and on the hardware in order to enable better performance.
- Data layer: The layer is important as it stores all data operations that are performed.

It must support full scalability from a single facility to a storage solution for data, which involves mainly security and faster access to the information.

10.1 COMMUNICATIONS

In the case of communication channels established there is a need for greater control and a closer monitoring on the management of communications by the area of technology in order to facilitate fast and efficient service to users without requiring a third party.

The communications infrastructure must be able to operate for all agencies.

The Land Management System provides easy access via Web Services, and integrated across different applications and interfaces and systems integration with other institutions providing remote access to the system.

The services to be provided by this network of communication channels are:

- Web Portal access of the institutions and in general for users and customers.
- Access through VPN (Virtual Private Network) of participatory institutions to exchange information of processes and procedures between the networks.
- Services to users who require information on the Internet.

For the proper development of communications there have been established two communication channels to access the Internet:

- A channel for Internet service with speeds of 1MB for sending information and a receiving channel of 2MB.
- Institutions should consider keeping an alternate channel for online backup with speeds of 1MB that allows on emergency, to maintain communication between systems.

10.2 LOCAL AREA NETWORK

Local networks is where the technological infrastructure (data center and local networks in the regional) is maintained. Based on international standards they will be EIA / TIA standard 5E or 6, and all components must be certified on the same standards.

There shall be a fiber optic backbone in star formation for the system through a central hub that allows a high data flow, free of electromagnetic interference.

10.3 SERVICE WIDESPREAD INTERNET ACCESS

This service is especially designed for widespread access entities, users and clients that require knowledge of all ways to access relevant information for their businesses based on which they decide to pursue industrial or agriculture investment opportunities.

The information presented on the Website should consider future participation or trade agreements with institutions abroad. They should consider making a replica of this information in other languages.

The Website should facilitate a system of user inquiries and complaints, especially important for the commercial or marketing excellence. Users involved in the process will be authorized to access the intranet via a username and security code to systems that are deployed or established.

10.4 SECURITY

Conceptually, any two entities in a distributed computing system act as a transmitter and the other one as a receiver. These entities must trust each other, so that the consumer receives information from the issuer and, likewise, the issuer only provides the right information to the appropriate receptors.

The solution allows certification and applying the digital signature in the exchange of information between two related institutions. A system is sure, if there are mechanisms for:

Authentication: The sender must uniquely identify the respective receiver. In the same form there must be authenticated on the reverse case (mutual authentication).

Authorization: The level of access given to the information produced depends on the type of receiver.

Audit: Must be done on non-redundant records of activity performed by the recipients of services and information.

Privacy: The information exchanged between the parties must remain unseen elsewhere.

Integrity: The information exchanged between the parties should not be altered during transmission to their final destination.

Availability: If the information is compromised or there is an error in the system, there should be instant recovery mechanisms.

Non-disclaimer: All the above mechanisms ensure that there is no way that a user denies performing an operation registered in his name.

The system must use a security model which follows international recommendations and standards. It will be used as a benchmark for the design, implementation and operation of the system, taking into account the Land Management System for the integrated management of Multi-Cadastre System and Land Registry System.

Safety is a constant concern inherent in any internet infrastructure. It is necessary to take extra care when referring to a Website with Electronic Trading. This is due to financial transactions such as payment services and risk of loss of confidence, in case the site is exposed to the possibility of having a successful attack.

Any security solution must be based on policies, systems configuration and dynamic actions in real time.

Security policies define the arrangements whereby operators, analysts and support equipment for each hazard expected. Also define how to act infrastructure security and how it adapted according to the profile of attacks on the Web portal.

The solution must support components that address the attempted attacks dynamically, taking defensive actions automatically (encapsulating the attacker) according to the nature of these attacks, as opposed to traditional market solutions that have a static behavior in relation to any attacks on the sites (which is efficient only at the time of implantation).

Understanding and monitoring the profile of the attacks is of great importance considering that these attacks are extremely dynamic and changing over time.

The system configuration will allow only essential services are available on each machine. The definition of appropriate settings for each system / application software must ensure that each machine in production has all the security attributes established security policies.

Dynamic actions in real time are the immediate responses of the security infrastructure to all attacks on the site. All actions taken automatically by the system should be based on security policies and should be adapted as it changes the profile of the attacks.

The design of a secure Internet infrastructure should include:

Policy filters for the router: The Politics of filters for the router should allow only services available on the Web portal can be accessed through the router. The use of load balancing infrastructure is capable of reducing the number of filters set on the router, increasing performance and safety of it.

Firewall: Firewall inner and outer shield must implement basic safety rules limiting access only to services defined for users of the Web Portal.

Using load balancing: The use of hardware load balancing is central to solving scalability and high availability servers. In addition, the hardware infrastructure adds security to the extent that hides the IP addresses of machines that are being addressed by it.

Segregated network for the data: The network should be divided into Web Portal security layers physically separated. It is the first layer encompassing the Internet and Firewall.

The second layer is between the firewall and servers to the public and the last layer, protected from the external network, which connects all the back-end infrastructure of the Web portal. This architecture segregates the data are on the network for possible infiltration into the system.

It is therefore important to also separate the different systems.

Detection or automatic response to attack: No security infrastructure will be complete if it detects and automatically responds to attacks on the system.

It is not sufficient to have a security policy, or outright secure configuration of servers.

The System must have a security infrastructure capable of recognizing the multiple possible attacks and take action immediately according to defined security policies.

10.5 DIGITAL SIGNATURES

The proposed system is considering implementation of digital signature certification and management by institutions participating in the Integrated Land Management System.

10.5.1 STANDARDS

Applications should use industry standards for communications, data representation, storage and data access, and even software construction standards:

10.6 COMMUNICATIONS STANDARDS

- TCP / IP (IPv5 or IPv6);
- UDP / IP (IETF RFC768);
- Web Portal Standards;
- HTTP/HTTPS;
- ebXML Ver 2.0 or higher;
- SOAP / WSDL;
- Web Services; and
- Standard relational database (RDBMS).

The infrastructure components of enterprise application integration (Enterprise Application Integration - EAI) must be separated from the application infrastructure.

For the integration with different system platforms is considered important to use systems that handle SOAP (Service Oriented Application Protocol) that facilitates a fluid exchange between systems and reduces development effort and provides interfaces to convert between protocols, allows associate specific functions of information exchange if is required.

10.7 KEY FEATURES

The set of technologies that form the technological architecture of the Integrated Information System meet basic requirements such as:

- Scalability: The technology architecture designed for the Integrated Land Management System must be scalable and support a gradual growth and amount of access you have.
- Availability: The technology architecture should have the ability to operate a mission critical solution, allowing users of the system, the constant availability of all services.
- Interoperability: The Comprehensive System of Land Management will interact with a set of external systems. In order to do this, the technology architecture should provide a framework where integration is possible with such systems quickly, easily and efficiently.

- Security: Data transactions, basic element of the Integrated Land Management System, are inherently high degree of data confidentiality. The solution must be built with the best encryption and security technologies to maintain complete confidentiality of transactions will be conducted on the Web Portal of participatory institutions.
- Reliability: The solution must be adequately tested by previous deployments in situations just like those required for Integrated Land Management System.
- Easy Operation: To minimize the problems of adapting the system for users and new deployments that are made, the software solution should be easy to operate, considering several user support facilities such as online Help, tutorials.
- Maintenance: The software must be flexible enough to quick changes (the Comprehensive System of land management has often issues).

10.8 ONLINE SUPPORT INFORMATION SYSTEM

The computing infrastructure provides the ability to operate in a cluster formation capable of maintaining a redundant fault, establishing systems mirror disk configuration and RAID 0 +1 ensuring largely no loss of information.

It shall maintain systems automatic backups and archives must be inventoried, attaching the description and specifications thereof, classifying the data into three categories according to their type of priority:

- Vital Information to the functioning of the offices of participating institutions.
- Necessary Information, but not indispensable in the offices of participating institutions (casual or temporary information).
- Information residing in workstations.

The support of information from the workstations must be carried out automatically and preset cycles and will be collected weekly in one of the above categories. This can be established by the system to perform this function.

10.9 CONTINGENCY PLANS

It also should choose to have an external online backup to allow continued operation in case of a catastrophic situation to continue operations carried out by partner institutions. (Example Arazi vs. a regional office)

The procedures associated with contingency plans should be included in documents to be responsible for knowing by the areas of participatory institutions and take appropriate measures to bring knowledge to subordinates according to the activities.

None of these possibilities can operate in really difficult situation, in which case one should plan to maintain a report of pending proceedings and processes to be performed, to be able to maintain manual work through until it resumes the management assisted by the Information technology infrastructure.

The procedures associated with contingency plans should be included in documents that managers should be aware of and be able to take appropriate action and inform subordinates in each activity area.

10.10 PLATFORM SOFTWARE SYSTEMS IN INSTITUTIONS

In the case of system software platform, institutions such as AGCHO, Arazi, MUDA, and the Supreme Court will have a direct impact on the Land Management System.

Related institutions have not consolidated or integrated systems, and in some cases they use open platforms for certain systems (ERP, Mail, Web Management), the majority of the processes are carried out with office tools (Word, Excel, Access) on work stations.

The platforms used are: Microsoft Windows and Linux as well as database engine Oracle 10G and Microsoft SQL 2003, Access to operate on Microsoft platform and ArcGIS mapping management, supports both operating system platforms.

An important factor is the knowledge that engineers have on the development of open platforms. In Afghanistan the highest level of knowledge is about the Microsoft platform. Engineers who manage other platforms are small in number.

Consequently, institutions that want to use open systems should consider the challenges in terms of costs, effort and ultimately strive for successful outcomes.

Our concept is to use a Microsoft platform because most engineers in Afghanistan are more knowledgeable about this platform, and because the potential of land management relies on this platform. It will support institutions in the following ways:

- There are countless products on the market that operate on this platform which were especially designed for government entities.
- Many of the networks of users and companies use similar platforms which facilitates the structuring of an exchange of information.
- The latest technologies such as handhelds like I Pack technology that are fully integrated with the technology of Microsoft products.

11.0 GENERAL PHYSICAL COMPUTER INFRASTRUCTURE MODEL

Just like in the case of a technological model that supports the operational systems, establishing a physical computer infrastructure model allows establishing a harmonious composition of computer equipment for each institution, considering the interaction that needs to occur.

Figure7 and Figure 8 depict the General Physical Computer Infrastructure for the Central Systems and Regional Systems:

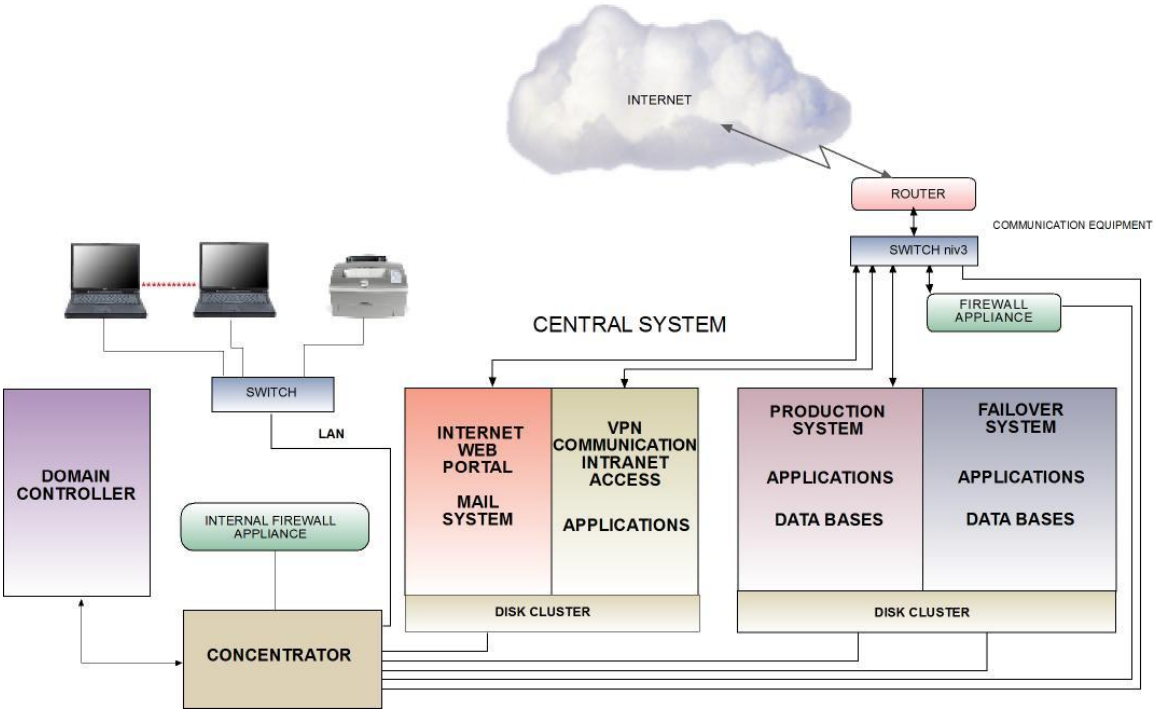


FIGURE 7

The physical infrastructure on the central level comprises:

- Two computers that support the Databases. The first is the production system and the second is the Failover system supported by a disk array and mirror configuration.

- Two computers, one supporting the Web Site & Mail System and the second Server the applications and Intranet access with a small disk array configuration.
- One server acting as Domain controller.
- One concentrator which interconnect the Server and communication equipment.
- Two firewall appliance one for the external control and the second for the internal control.
- Two switches - one for the local area network and the second for the connectivity of the VLANs.
- Routers depending on the connections that will be established to other organizations.
- Work Station, Printers/Plotters, Scanners, wireless equipment depending on the needs identified in the institutions.
- Special equipment and furnishing, as desks, chairs, air-conditioning, electricity generator (depending on the needs identified by each institution).

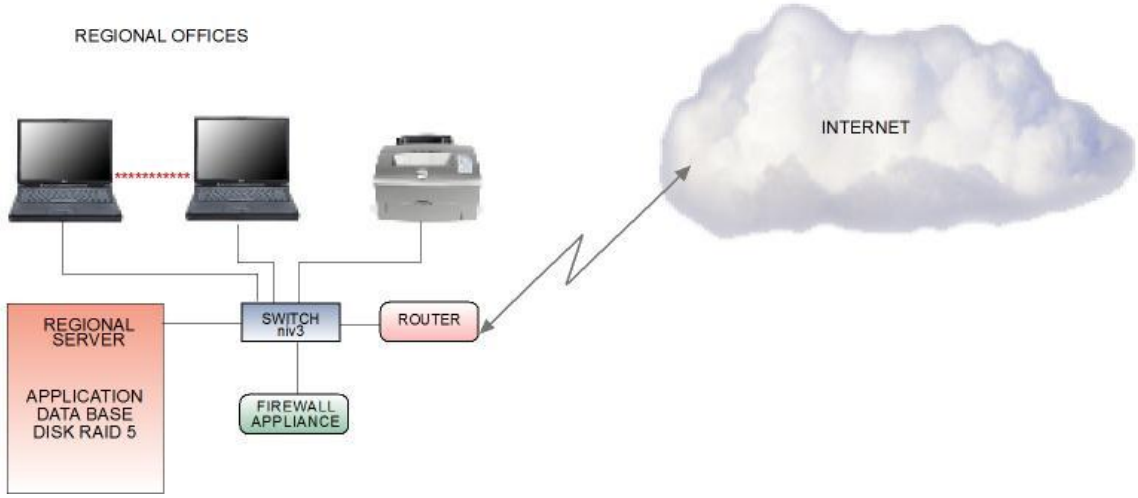


FIGURE 8

The physical infrastructure on the regional level consisting of:

- One server acting as Application and Database server supporting local operations.
- One Switch for the connections.
- One router for the external connections and communications.
- One Firewall for the access inbound and outbound control.
- Work Station, Printers Plotters, Scanners, wireless equipment depending on the needs identified in the institutions.
- Special equipment and furnishing, as desks, chairs, air-conditioning, electricity generator (depending on the needs of each institution).

Figure 9 depicts the infrastructure provided for the Universities:

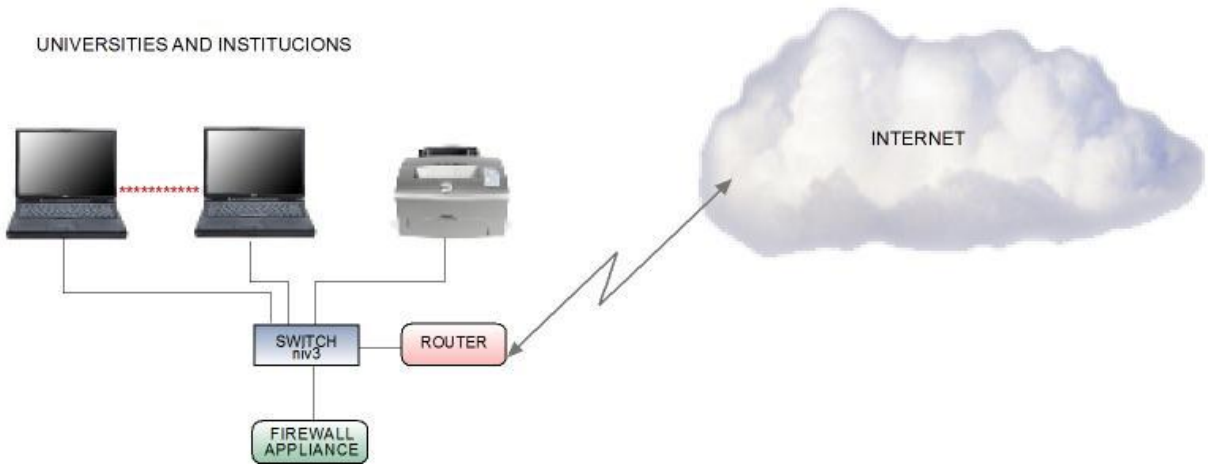


FIGURE 9

- One Switch for the connections.
- One router for the external connections and communications.
- One Firewall for the access inbound and outbound control.
- Work station, printer plotters, scanners, wireless equipment depending on the needs identified in the institutions.
- Special equipment and furnishing, as desks, chairs, air-conditioning, electricity generator (depending on the needs of each institution).

12.0 SPECIFIC INFRASTRUCTURE MODEL FOR THE INSTITUTIONS

The model describes the Hardware structures of the institutions involved in the LARA project.

12.1 HARDWARE CONFIGURATION FOR AGCHO

According to the processes that taking place in AGCHO, here is the physical structure of the computer infrastructure required in the institution.

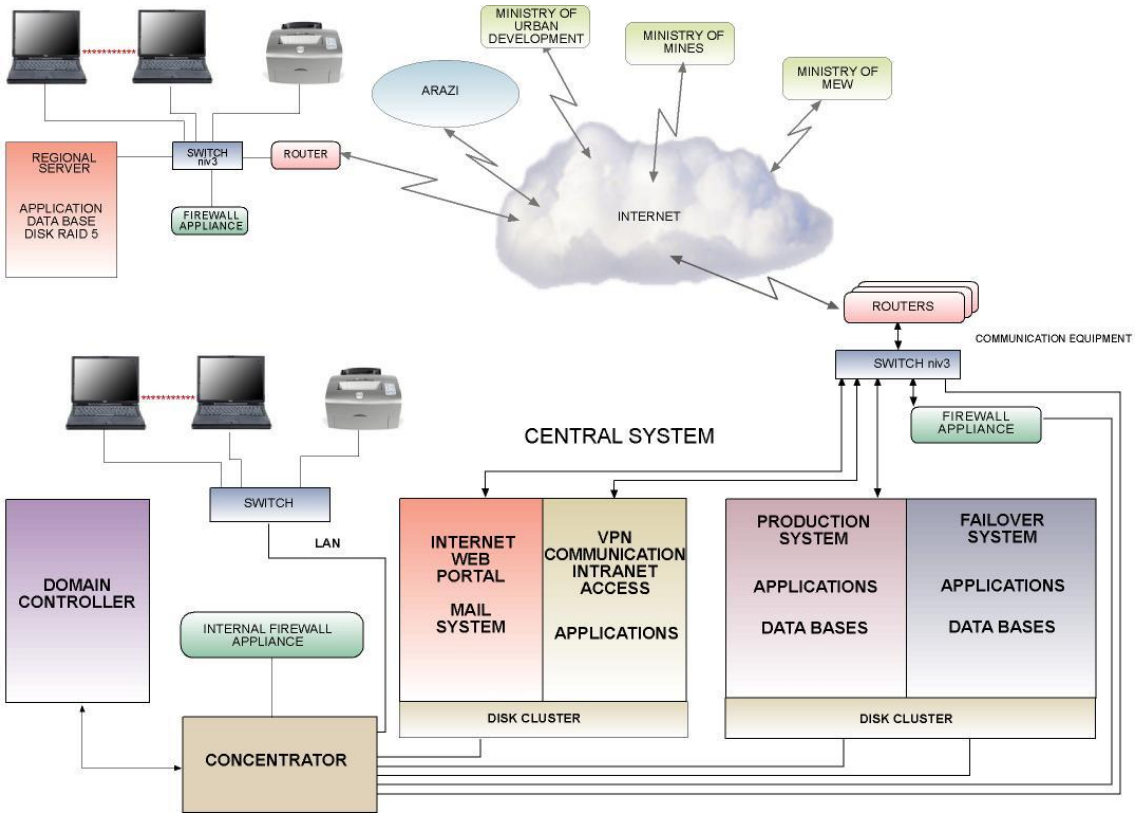


FIGURE 10

12.2 HARDWARE CONFIGURATION FOR ARAZI

According to the existent processes in Arazi, here is the physical structure of the computer infrastructure required in the institution.

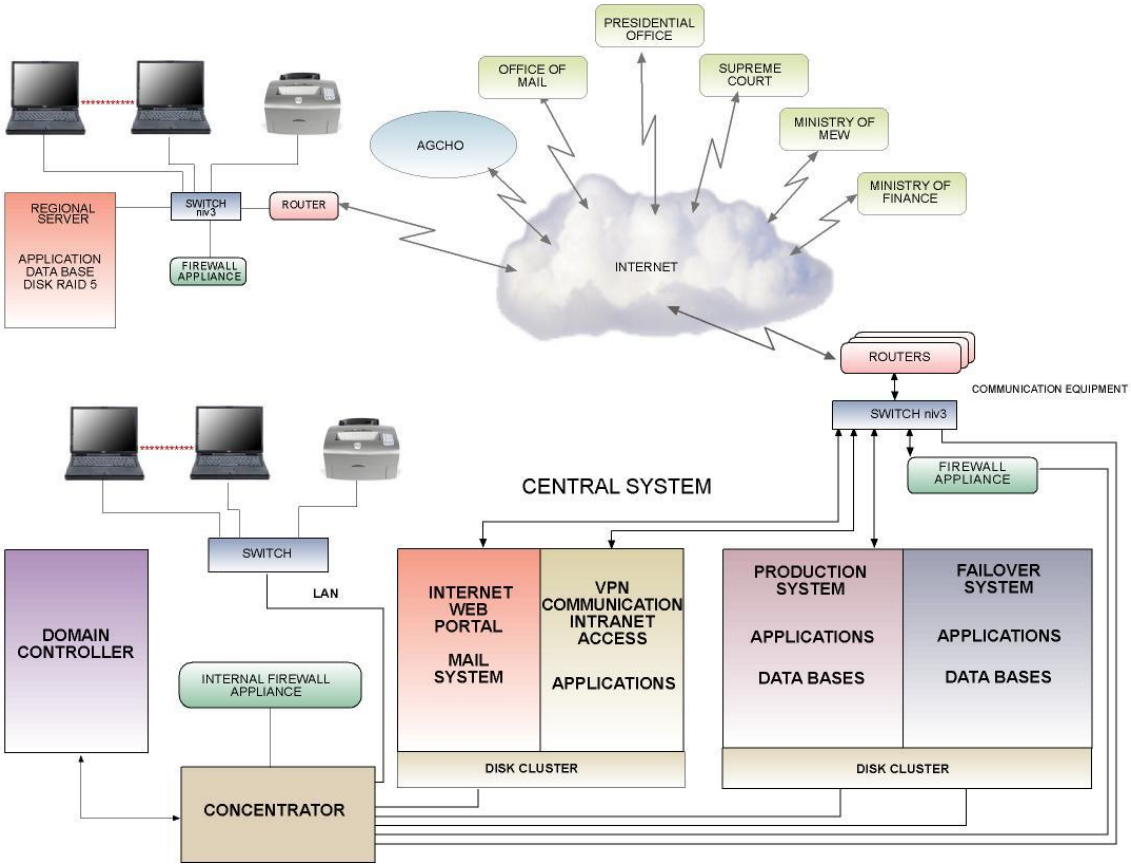


FIGURE 11

12.3 HARDWARE CONFIGURATION FOR MUDA

According to the existing processes in MUDA, here is the physical structure of the computer infrastructure required in this institution.

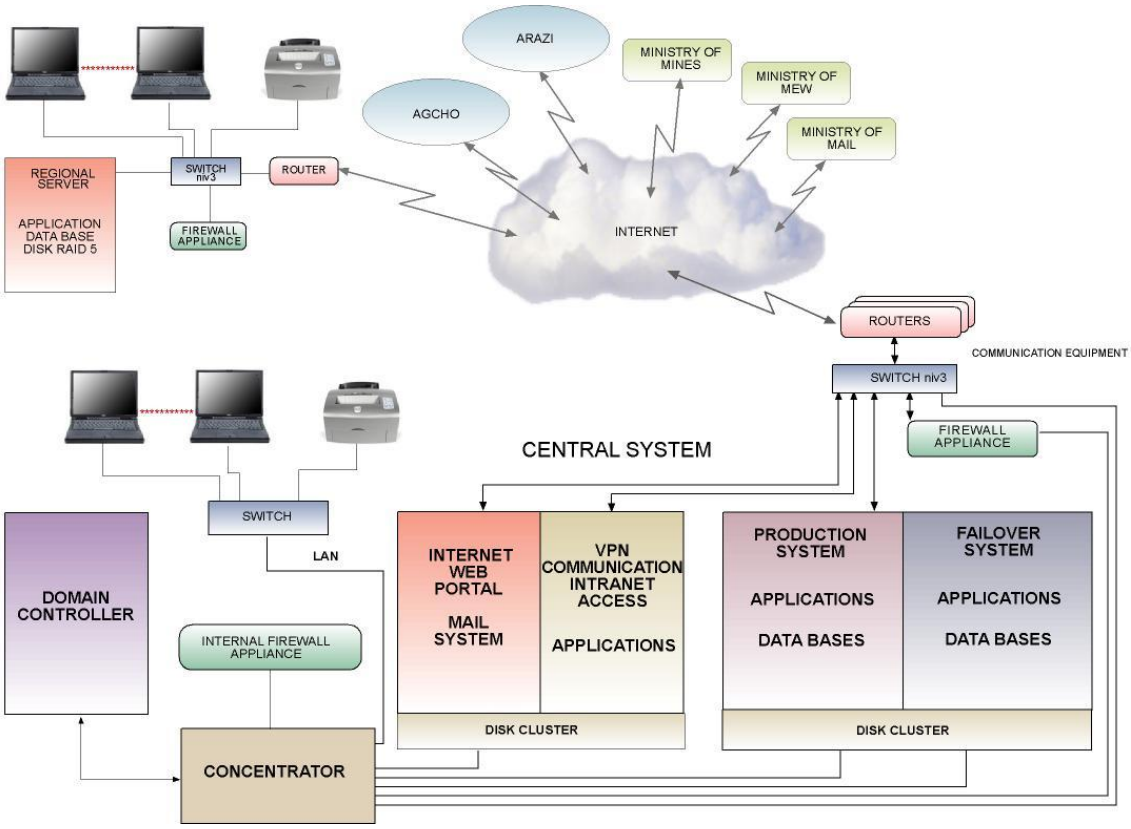


FIGURE 12

12.3 HARDWARE CONFIGURATION FOR IDLG

According to the existing processes in IDLG, here is the physical structure of the computer infrastructure required in this institution.

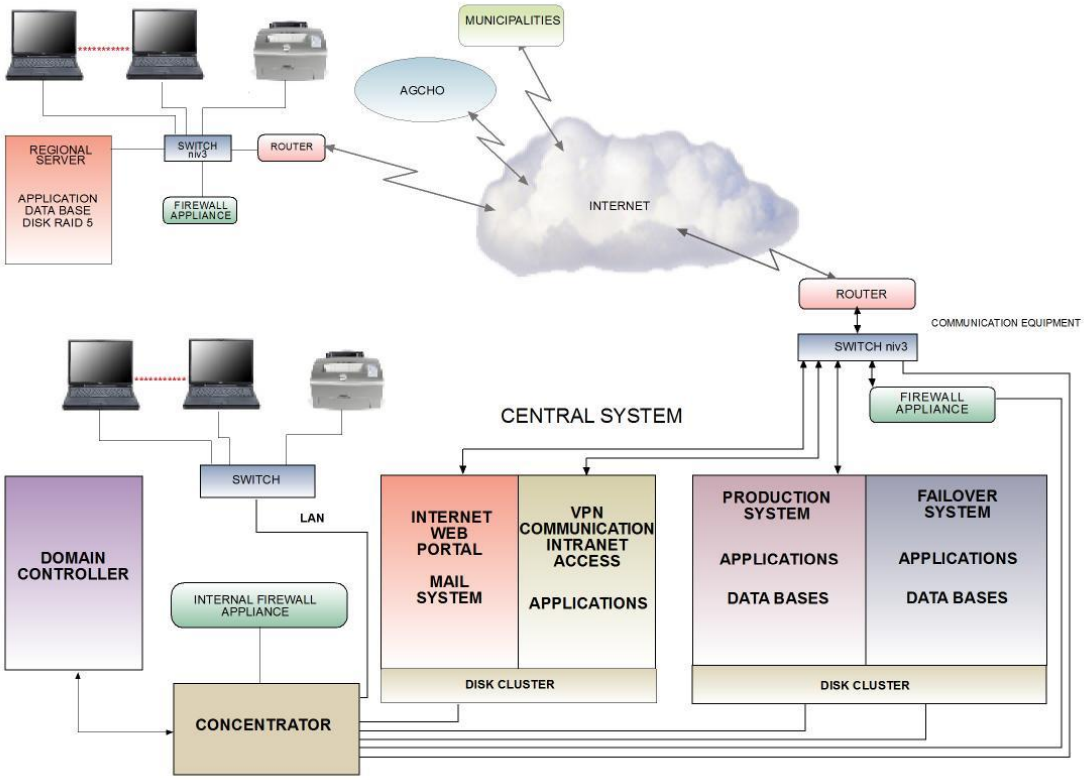


FIGURE 13

12.4 REGIONAL OFFICES AND OTHER INSTITUTIONS

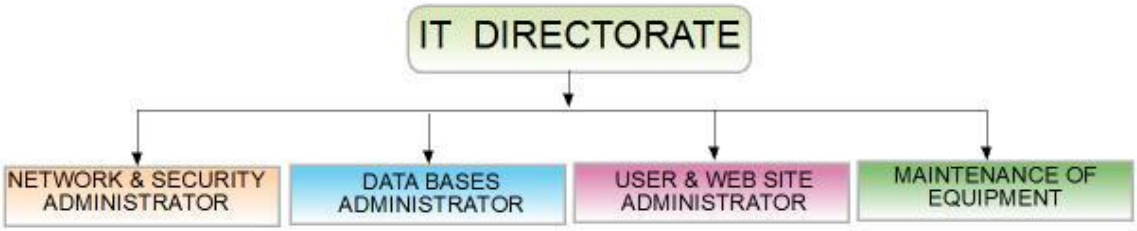
The regional offices and other institutions have the configuration depicted in Figure 8.

12.5 UNIVERSITIES AND INSTITUTIONS RELATED TO LAND MANAGEMENT

Universities and other higher education institutions related to land management have the configuration depicted in Figure 9.

13.0 ICT ORGANIZATIONAL STRUCTURE AREA

There is a minimum area organizational structure that includes various activity areas and requires a certain type of service:



The functions associated with these tasks are described below:

13.1 DIRECTOR OF ICT

PLANNING	EXECUTION	CONTROL
Advises the General Manager in each competency area, and in particular on strategic planning	Ensures the maintenance and updating of the Database Information	Monitors the performance of Information Systems and production activities and responsibilities of each IT professional in the area
Advises the General Manager in defining the infrastructure requirements and systemic support.	Runs the installation of new software products that have been decided upon with management	Ensures the proper use of computer systems and resources maintained by the entity
Plans and defines together with the respective department within that institution the product plans for information systems (required for the development of activities in accordance with the plans of the General Manager).	Implements training of staff and external users according to the plans that were approved by General Management	Submits progress reports to the general management on the activities developed in the ICT Department
Defines the training plan (for internal and external users) on using the tools and technologies to be acquired for the institution.	Implements and executes policy plans for quality, safety and contingency	Ensures the quality of information held in Databases.
Plans the human resources needed to manage each area and reports to the general management.		

The professional profile would require an engineer with extensive experience in systems management (in particular Geographical and Land Management Systems), with a high degree of knowledge in the management of databases and systems with dynamic structures.

The person should have experience in senior management positions in the area of information technologies and should be able to provide support in management and business development. He or she would have to possess leadership skills and knowledge in that respective field and hold an advanced degree in Engineering Management Information Systems and Electronic Engineering, Graduate Specialization in Management of Information Resources and large capacity in the management of geo-referenced system (GIS).

The Director should have proven ability in managing large enterprises, especially in cartography and cadastre, and also possess an entrepreneurial spirit.

This duplication may in some cases lead to different assessments regarding the application of information technology; usually many of the organizational structures of institutions are dependent on the area of information technology on the Presidency.

13.2 NETWORK ADMINISTRATOR, COMMUNICATIONS AND SECURITY

PLANNING	EXECUTION	CONTROL
Advises management in the area of ICT competence and in particular on the security associated with communications networks.	Monitors and controls the various communications resources are there in the entity	Monitors the performance of telecommunication systems
Assists in defining the infrastructure requirements and supports networking and security	Implements new security schemes	Ensures proper use of communication channels that keep the entity
Plans and defines together with the areas of the Institution expansion plans involving resources of communication networks and associated security	Implements new communications channels according to the needs and requirements of the Institution	Controls and monitors network security issues
	Maintains control of telecommunications in relation to the backups that are made through the network.	Identifies possible actions to access intrusion attempts, broadcast, collisions and other technical issues that may affect the performance of the channels
	Facilitates access of the virtual space by new users, based on instructions from the ICT Director.	Makes reports on its activities to the ICT Director.
		Ensures the quality of telecommunications services and networks

This profile would require an Electronic or Telecommunications Systems Engineer, with extensive experience in telecommunications and with a high degree of knowledge in safety management and transaction flow control.

The Administrator should have experience in similar positions in the area of telecommunications and possess knowledge in operating systems and tools for network performance, as well as in network security systems and monitoring and transaction of flow control.

13.3 DATABASE ADMINISTRATOR AND APPLICATIONS

PLANNING	EXECUTION	CONTROL
Advise management in the area of ICT competence and in particular on databases management.	Launch new information databases and more appropriate database structures	Ensuring the quality of service and information that support the databases.
Assist in defining Institution requirements in relation to structuring and implementation of new information databases.	Implement processes backup, recovery and contingency of information in the databases.	Monitor the performance of database systems
Plan and define together with the areas of the institution's expansion plans involving resources databases.	Support managers in extracting the information they need.	Ensure proper use of computer systems and resources maintained by the entity in relation to databases
Define the training plan for internal and external users in using the tools available to the institution in this regard.	Implement schemes to generate information required by the Direction of ICT	Control and monitor access to the databases and verify the operational burden
	Implement training of staff and users	Identify possible actions to inconsistencies in the information on the applications that are implemented
	Providing access to databases by new users according to the ICT direction	Report on own activities and responsibilities to the management of ICT

The profile would be the one of a Systems Engineer with extensive experience in systems management and administration of databases with a high degree of knowledge structuring relational models, models documentaries, geo-referenced models and information extraction. The Administrator should have experience in similar positions in the area of information technologies to databases management, as well as specific experience in engines relational database, geo-referenced (GIS) and associated fields.

The person should possess a degree in Systems Engineering or have proven experience in the field, as well as the ability in managing large systems especially in the environment mapping and cadastre.

13.4 SERVER & WORKSTATION ADMINISTRATOR AND ADMINISTRATIVE SYSTEMS ADMINISTRATOR

PLANNING	EXECUTION	CONTROL
Advise management in the area of ICT competence and in particular the management and administration of servers	Implement new applications to be developed.	Monitor the performance of servers and various services (Email, Web, Intranet, Extranet and Internet

PLANNING	EXECUTION	CONTROL
Assist in defining the requirements for the institution in terms of structuring new information services and applications that are implemented	Manage, maintain the server platform and workstation network, execute corrective and preventive procedures	Ensure the proper use of resources, systems and technology platform implemented
Together with departments within the institution, plan and define expansion plans for new products or actions	Implement requests that ask for action from the ICT in relation to ongoing projects	Monitor user access and check the server load
Define the training plan for internal and external users in the use of tools and applications available by the institution	Implement training of staff and users on different systems and mission management	Ensure the availability of all the services established
Define the procedure for preventive and corrective maintenance of servers and workstations	Maintain relationships with customers and users from requirements or concerns that arise in the use of the Services and Applications	Monitoring & control of the security structure, revise inconsistencies
Define the security structures, user access, file sharing, email, and Website	Facilitate access to new users according to the ICT Direction	Report on own activities and responsibilities to the Director of ICT

The ideal profile would be the one of a Systems Engineer with extensive knowledge in administration and systems management and that would have a degree in Systems Engineering degree or proven similar experience. The person should have experience in IT projects implementation in accordance with the instructions given by the direction of ICT, as well as experience in structuring and systemic platform management and integration of administrative tools. The Administrator should possess the ability to integrate different platforms systemic applying concepts of Services Oriented Application Protocol - (SOAP) and have a proven successful track record in working with land management-related government agencies

13.5 SUPPORT OFFICE AUTOMATION PLATFORM

PLANNING	EXECUTION	CONTROL
Design the plan based on the policies ICT leadership on preventive and corrective maintenance of equipment and office software	Maintain the database of the equipment and office applications of the institution	Ensure compliance with appropriate use policies and information resources systems maintained by the institution
Assist in defining requirements of the Institution regarding new equipment and office services.	Perform preventive maintenance of office equipment infrastructure, according to the defined plan	Identify solutions to errors that occur in the equipment
Plan the replacing of office equipment	Assisting managers with their needs	Monitor the performance of office equipment
Define the training plan for internal users in the use of office tools managed by the institution	Implement the requirements or requests that the direction of ICT performed	Perform activities reports for the Director of ICT

PLANNING	EXECUTION	CONTROL
	Implement training of staff and users in office automation tools	
	Support the Systems Management area on necessary tasks	

The ideal profile would be the one of an Electronics/Systems Technician with extensive knowledge in hardware support and maintenance and office tools. The Technician should have a degree in electronics and /or systems or proven similar experience and be skilled in the development of preventive and corrective maintenance of office equipment. The person should also have experience in supporting users in solving specific requirements on the use of office tools and optimization of their use.

The Technician needs to undergo training in the use of office tools in order to increase his or her ability to manage resources and office tools, according to the policies in place. The Technician needs to provide leadership and permanently improve his/her capacity in the area.

14.0 EXECUTION PLAN

14.1 INVESTMENT APPROACH

According to the characteristics and needs identified for institutions related to LARA, we propose an approach for each of these institutions, with regards to the required infrastructure and the associated costs.

The approach is for each of the following institutions:

- AGCHO;
- Arazi;
- MUDA;
- IDLG;
- REO;
- MUN; and
- SCO

14.1.1 COST SUMMARY

Chart 18 shows a cost summary of the execution plan.

Item	Institution	Software	Hardware	Infrastructure	Hardware/Software
1	Arazi	69,500	209,900	55,800	335,200
1	Arazi regional	25,500	95,300	32,800	153,600
1	Agcho	74,500	235,000	55,800	365,300
1	Agcho regional	25,500	95,300	32,800	153,600
1	Muda	64,500	143,500	60,800	268,800
1	Muda Regional	25,500	95,300	32,800	153,600
1	IDLG	64,500	141,400	60,800	266,700
1	Municipality	32,000	97,400	28,600	158,000
1	Supreme Court	25,500	75,800	26,800	128,100
3	Universities	133,500	147,000	64,800	345,300
		540,500	1,335,900	451,800	**2,328,200**

CHART 18

14.1.2 DETAILED COST

AGCHO Afghan Geodesy and Cartography Head Office

Chart 19 details approach proposed for AGCHO for the required infrastructure, together with the associated costs:

AGCHO				
COMPUTER HARDWARE AGCHO	NR.U	U.COST	TOT.COS	SUMARY
EQUIPMENT				235,000
Router	1	500	500	
Firewall	2	1,000	2,000	
Switch	1	2,000	2,000	
Switch	2	600	1,200	
Enclosure Rack Chassis Mount	1	5,000	5,000	
Patch Pannel	1	500	500	
Server + disk + backup + ...	1	100,000	100,000	
Pc's includes windows 7 professional	30	2,000	60,000	
External disk 1 TB	20	300	6,000	
Printer	5	400	2,000	
Plotter	1	20,000	20,000	
Scanner A 3	2	8,000	16,000	
Second Display	15	300	4,500	
Lan Network Cabeling	20	100	2,000	
Wireless Acces router	5	500	2,500	
Air Conditioner	1	800	800	
Ups	1	10,000	10,000	
COMPUTER SYSTEM SOFTWARE				
SOFTWARE				74,500
Security appliance	1	3,000	3,000	
Data base	1	20,000	20,000	
Operating System	4	8,500	34,000	
Anti virus	1	2,500	2,500	
Office	30	500	15,000	
OFFICE CONDITIONING				
OFFICES				55,800
Electrical Conditioning	1	5,000	5,000	
Alternate Energy generator	1	40,000	40,000	
Furnishing	1	10,000	10,000	
Air Conditioner	1	800	800	
				365,300

CHART 19

Arazi - Formerly the Afghan Land Agency (ALA)

Chart 20 details the approach proposed for Arazi for the required infrastructure, together with the associated costs:

ARAZI				
COMPUTER HARDWARE ARAZI	NR.U	U.COST	TOT.COS	SUMARY
EQUIPMENT				209,900
Router	1	500	500	
Firewall	2	1,000	2,000	
Switch	1	2,000	2,000	
Switch	1	600	600	
Enclosure Rack Chassis Mount	1	5,000	5,000	
Patch Pannel	1	500	500	
Server + disk + bacup + ...	1	100,000	100,000	
Pc's includes windows 7 professional	20	2,000	40,000	
External disk 1 TB	10	300	3,000	
Printer	5	400	2,000	
Plotter	1	20,000	20,000	
Scanner A3	2	8,000	16,000	
Second Display	10	300	3,000	
Lan Network Cabeling	20	100	2,000	
Wireless Acces router	5	500	2,500	
Air Conditioner	1	800	800	
Ups	1	10,000	10,000	
COMPUTER SYSTEM SOFTWARE				
SOFTWARE				69,500
Security appliance	1	3,000	3,000	
Data base	1	20,000	20,000	
Operating System	4	8,500	34,000	
Anti virus	1	2,500	2,500	
Office	20	500	10,000	
OFFICE CONDITIONING				
OFFICES				55,800
Electrical Conditioning	1	5,000	5,000	
Alternate Energy generator	1	40,000	40,000	
Furnishing	1	10,000	10,000	
Air Conditioner	1	800	800	
			TOTAL	335,200

CHART 20

MUDA (Ministry of Urban Development Affairs)

Chart 21 details the approach of MUDA for the required infrastructure, together with the associated costs:

MUDA				
COMPUTER HARDWARE MUDA	NR.U	U.COST	TOT.COS	SUMARY
EQUIPMENT				143,500
Router	1	500	500	
Firewall	2	1,000	2,000	
Switch	1	2,000	2,000	
Switch	2	600	1,200	
Enclosure Rack Chassis Mount	1	5,000	5,000	
Patch Pannel	1	500	500	
Server + disk	1	80,000	80,000	
Pc's includes windows 7 professional	10	2,000	20,000	
External disk 1 TB	5	300	1,500	
Printer	5	400	2,000	
Plotter	1	5,000	5,000	
Scanner A 3	1	8,000	8,000	
Second Display	5	300	1,500	
Lan Network Cabeling	10	100	1,000	
Wireless Acces router	5	500	2,500	
Air Conditioner	1	800	800	
Ups	1	10,000	10,000	
COMPUTER SYSTEM SOFTWARE				
SOFTWARE				64,500
Security appliance	1	3,000	3,000	
Data base	1	20,000	20,000	
Operating System	4	8,500	34,000	
Anti virus	1	2,500	2,500	
Office	10	500	5,000	
OFFICE CONDITIONING				
OFFICES				60,800
Electrical Conditioning	1	10,000	10,000	
Alternate Energy generator	1	40,000	40,000	
Furnishing	1	10,000	10,000	
Air Conditioner	1	800	800	
			TOTAL	268,800

CHART 21

IDLG (Independent Directorate of Local Governance)

Chart 22 details the approach of IDLG of the required infrastructure, together with the associated costs:

IDLG				
COMPUTER HARDWARE IDLG	NR.U	U.COST	TOT.COS	SUMARY
EQUIPMENT				141,400
Router	1	500	500	
Firewall	2	1,000	2,000	
Switch	1	2,000	2,000	
Switch	1	600	600	
Enclosure Rack Chassis Mount	1	5,000	5,000	
Patch Pannel	1	500	500	
Server + disk	1	80,000	80,000	
Pc's includes windows 7 professional	10	2,000	20,000	
External disk 1 TB	5	300	1,500	
Printer	5	400	2,000	
Plotter	1	5,000	5,000	
Scanner	1	8,000	8,000	
Lan Network Cabeling	10	100	1,000	
Wireless Acces router	5	500	2,500	
Air Conditioner	1	800	800	
Ups	1	10,000	10,000	
COMPUTER SYSTEM SOFTWARE				
SOFTWARE				64,500
Security appliance	1	3,000	3,000	
Data base	1	20,000	20,000	
Operating System	4	8,500	34,000	
Anti virus	1	2,500	2,500	
Office	10	500	5,000	
OFFICE CONDITIONING				
OFFICES				60,800
Electrical Conditioning	1	10,000	10,000	
Alternate Energy generator	1	40,000	40,000	
Furnishing	1	10,000	10,000	
Air Conditioner	1	800	800	
				266,700

CHART 22

REO Regional Offices of AGCHO

Chart 23 details the approach of AGCHO Regional Offices of the required infrastructure, together with the associated costs:

REGIONAL OFFICE AGCHO				
COMPUTER HARDWARE	NR.U	U.COST	TOT.COS	SUMARY
EQUIPMENT				95,300
Router	1	500	500	
Firewall	1	1,000	1,000	
Switch	1	800	800	
Enclosure Rack Chassis Mount	1	5,000	5,000	
Patch Pannel	1	500	500	
Server + disk	1	40,000	40,000	
Pc's includes windows 7 professional	10	2,000	20,000	
External disk 1 TB	5	300	1,500	
Printer	3	400	1,200	
Ploter	1	5,000	5,000	
Scanner A3	1	8,000	8,000	
Second Display	5	300	1,500	
Lan Network Cabeling	10	100	1,000	
Wireless Acces router	3	500	1,500	
Air Conditioner	1	800	800	
Ups	1	7,000	7,000	
COMPUTER SYSTEM SOFTWARE				
SOFTWARE				25,500
Security appliance	1	1,000	1,000	
Data base Ms Express	1	10,000	10,000	
Operating System	1	8,500	8,500	
Anti virus	1	1,000	1,000	
Office	10	500	5,000	
OFFICE CONDITIONING				
OFFICES				32,800
Electrical Conditioning	1	5,000	5,000	
Alternate Energy generator	1	15,000	15,000	
Furnishing	1	7,000	7,000	
Paper	1	5,000	5,000	
Air Conditioner	1	800	800	
				153,600

CHART 23

REO Regional Offices of Arazi

Chart 24 presents the approach for Arazi Regional Offices for the required infrastructure, together with the associated costs:

REGIONAL OFFICE ARAZI				
COMPUTER HARDWARE	NR.U	U.COST	TOT.COS	SUMARY
EQUIPMENT				95,300
Router	1	500	500	
Firewall	1	1,000	1,000	
Switch	1	800	800	
Enclosure Rack Chassis Mount	1	5,000	5,000	
Patch Pannel	1	500	500	
Server + disk	1	40,000	40,000	
Pc's includes windows 7 professional	10	2,000	20,000	
External disk 1 TB	5	300	1,500	
Printer	3	400	1,200	
Ploter	1	5,000	5,000	
Scanner A3	1	8,000	8,000	
Second Display	5	300	1,500	
Lan Network Cabeling	10	100	1,000	
Wireless Acces router	3	500	1,500	
Air Conditioner	1	800	800	
Ups	1	7,000	7,000	
COMPUTER SYSTEM SOFTWARE				
SOFTWARE				25,500
Security appliance	1	1,000	1,000	
Data base	1	10,000	10,000	
Operating System	1	8,500	8,500	
Anti virus	1	1,000	1,000	
Office	10	500	5,000	
OFFICE CONDITIONING				
OFFICES				32,800
Electrical Conditioning	1	5,000	5,000	
Alternate Energy generator	1	15,000	15,000	
Furnishing	1	7,000	7,000	
Paper	1	5,000	5,000	
Air Conditioner	1	800	800	
			TOTAL	153,600

CHART 24

REO Regional Offices of MUDA

Chart 25 details the approach proposed for MUDA Regional Offices for the required infrastructure, together with the associated costs

REGIONAL OFFICE MUDA					
COMPUTER HARDWARE		NR.U	U.COST	TOT.COS	SUMARY
	EQUIPMENT				95,300
	Router	1	500	500	
	Firewall	1	1,000	1,000	
	Switch	1	800	800	
	Enclosure Rack Chassis Mount	1	5,000	5,000	
	Patch Pannel	1	500	500	
	Server + disk	1	40,000	40,000	
	Pc's includes windows 7 professional	10	2,000	20,000	
	External disk 1 TB	5	300	1,500	
	Printer	3	400	1,200	
	Ploter	1	5,000	5,000	
	Scanner A3	1	8,000	8,000	
	Second Display	5	300	1,500	
	Lan Network Cabeling	10	100	1,000	
	Wireless Acces router	3	500	1,500	
	Air Conditioner	1	800	800	
	Ups	1	7,000	7,000	
COMPUTER SYSTEM SOFTWARE					
	SOFTWARE				25,500
	Security appliance	1	1,000	1,000	
	Data base	1	10,000	10,000	
	Operating System	1	8,500	8,500	
	Anti virus	1	1,000	1,000	
	Office	10	500	5,000	
OFFICE CONDITIONING					
	OFFICES				32,800
	Electrical Conditioning	1	5,000	5,000	
	Alternate Energy generator	1	15,000	15,000	
	Furnishing	1	7,000	7,000	
	Paper	1	5,000	5,000	
	Air Conditioner	1	800	800	
					153,600

CHART 25

MUN Municipality

Chart 26 details the approach proposed for Municipalities for the required infrastructure, together with the associated costs:

MUNICIPALITY				
COMPUTER HARDWARE MUNICIPALITY	NR.U	U.COST	TOT.COS	SUMARY
EQUIPMENT				97,400
Router	1	500	500	
Firewall	2	1,000	2,000	
Switch	1	2,000	2,000	
Switch	1	600	600	
Enclosure Rack Chassis Mount	1	5,000	5,000	
Patch Pannel	1	500	500	
Server + disk	1	40,000	40,000	
Pc's	10	2,000	20,000	
External disk 1 TB	5	300	1,500	
Printer	5	400	2,000	
Plotter	1	5,000	5,000	
Scanner	1	8,000	8,000	
Lan Network Cabeling	10	100	1,000	
Wireless Acces router	3	500	1,500	
Air Conditioner	1	800	800	
Ups	1	7,000	7,000	
COMPUTER SYSTEM SOFTWARE				
SOFTWARE				32,000
Security appliance	1	1,000	1,000	
Data base	1	10,000	10,000	
Operating System	1	8,500	8,500	
Anti virus	1	2,500	2,500	
Paper	1	5,000	5,000	
Office	10	500	5,000	
OFFICE CONDITIONING				
OFFICES				28,600
Electrical Conditioning	1	5,000	5,000	
Alternate Energy generator	1	15,000	15,000	
Furnishing	1	7,000	7,000	
Air Conditioner	2	800	1,600	
				158000

CHART 26

SCO Supreme Court

Chart 27 details the approach proposed for the Supreme Court for the required infrastructure, together with the associated costs:

SUPREMECOURT				
COMPUTER HARDWARE	NR.U	U.COST	TOT.COS	SUMARY
EQUIPMENT				75,800
Router	1	500	500	
Firewall	1	1,000	1,000	
Switch	1	800	800	
Enclosure Rack Chassis Mount	1	5,000	5,000	
Patch Pannel	1	500	500	
Server + disk	1	26,000	26,000	
Pc's includes windows 7 professional	10	2,000	20,000	
External disk 1 TB	5	300	1,500	
Printer	3	400	1,200	
Scanner A3	1	8,000	8,000	
Second Display	5	300	1,500	
Lan Network Cabeling	10	100	1,000	
Wireless Acces router	2	500	1,000	
Air Conditioner	1	800	800	
Ups	1	7,000	7,000	
COMPUTER SYSTEM SOFTWARE				
SOFTWARE				25,500
Security appliance	1	1,000	1,000	
Data base	1	10,000	10,000	
Operating System	1	8,500	8,500	
Anti virus	1	1,000	1,000	
Office	10	500	5,000	
OFFICE CONDITIONING				
OFFICES				26,800
Electrical Conditioning	1	5,000	5,000	
Alternate Energy generator	1	10,000	10,000	
Furnishing	1	7,000	7,000	
Paper	1	4,000	4,000	
Air Conditioner	1	800	800	
			TOTAL	**128,100**

CHART 27

UNI Universities

Chart 28 details the approach proposed for Universities for the required infrastructure, together with the associated costs:

UNIVERSITIY OF KABUL, KABUL POLITECHNICUM, AGCHO INSTITUT KABUL				
COMPUTER HARDWARE	NR.U	U.COST	TOT.COST	SUMARY
EQUIPMENT				49,000
Router external	1	500	500	
Firewall	1	1,000	1,000	
Switch	1	1,000	1,000	
Patch Pannel	1	500	500	
Pc's includes windows 7 professional	20	2,000	40,000	
Lan Network Cabeling	10	100	1,000	
Wireless Acces router	2	500	1,000	
Ups	20	200	4,000	
COMPUTER SYSTEM SOFTWARE				
SOFTWARE				44,500
Security appliance	1	2,000	2,000	
Arcgis 10	20	1,500	30,000	
Anti virus	1	2,500	2,500	
Office	20	500	10,000	
OFFICE CONDITIONING				
OFFICES				21,600
Electrical Conditioning	1	5,000	5,000	
Furnishing	1	10,000	10,000	
Paper	1	5,000	5,000	
Air Conditioner	2	800	1,600	
			Parcial cost	**115,100**
			TOTAL	**345,300**

CHART 28

15.0 SPECIAL RECOMENDATION

1. The most important recommendation is that regardless of the institutions responsible for managing their own systems and processes, these systems must be integrated through transfer protocols and information should be updated to maintain data integrity. It is essential that systems have the same common information, even though each institution is the authority responsible for the data produced.
2. Each institution should be responsible for the functions that fall within its authority. For instance, AGCHO should be responsible for all information related to land management and land registers, and must provide such information to all entities requesting it. This information should be accompanied by different layers (like the state economic interests, mining, forestry, restrictions, environment, roads, electricity networks and others) which can provide information that is essential to know before making concessions of land. If not taken into account at the right time, the lack of such information will cause problems to the granting institution and the State.
3. Build the capacity of systems engineers to manage installations that require extensive knowledge on exchange protocols, communications, database management systems and core business expertise.

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