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### **DEVELOPMENT OF SPATIAL DATA INFRASTRUCTURE**

**LESOTHO**

**Department of Lands, Surveys and Physical Planning.**

**MASERU Lesotho**

**Email: Mabutib@LSPP.Gov.LS**

**COUNTRY REPORT: LESOTHO  
CODI-2 GEO-INFORMATION**

**DEVELOPMENT OF SPATIAL DATA INFRASTRUCTURE  
IN LESOTHO**

## ***INTRODUCTION***

Spatial data is crucial for sustainable land management and environmental protection; therefore the development of spatial data infrastructure (SDI) ensures accessibility of information for decision-making. Many national organizations have begun to recognize the need to justify the large public investments they receive by improving access and encouraging a broader use of the information in their custody. The basic attributes of an SDI are well defined and agreed, yet the achievement of this ambitious concept is not easy, especially for developing countries who ironically need it most, for social and economic development.

As in many other developing countries, spatial data in Lesotho is collected by different organizations, most often for their own specific use. Incompatibilities and institutional obstacles may hinder access to such datasets by other organizations. These make the design, implementation and maintenance of national spatial data information multi-dimensional and complex. SDIs have institutional, organizational and technical implications that deviate from the set up of traditional government data collection organizations.

This report highlights the steps being taking with regards to policy, institutional arrangements and status of datasets in Lesotho to make spatial information easily available at affordable cost and to avoid unnecessary duplication by promoting the sharing of available data. Finally lack of human and financial resources which are major constraints are also discussed. The report is mainly based on the experiences of the Department of Lands, Surveys and Physical Planning, which is a major player in the creation of SDI in Lesotho.

## ***POLICY***

A data management workshop held by the Committee for Environmental Data Management (CEDAMA) in December 1999, identified several policy issues that needs to be addressed. These issues include ownership and copyrights, privacy, freedom of access to public data, standards and quality

control. Although a national policy for geo-information is not yet in place, the issue is receiving serious attention in various quarters. For example, the Land Policy Review Commission (2000) recommends the setting up of a Ministry of Lands and Environment to take charge of, and coordinate land matters – which includes policies on SDIs. The new ministry will spearhead the setting up of laws and regulations concerning geo-information to avoid unnecessary duplication and standardization of datasets.

Meanwhile, the Department of Lands Surveys and Physical Planning has formulated policies concerning pricing and copyright of its datasets. It has also developed standard license agreements for private and commercial use of these products. Consumers who are mostly commercial enterprises, and consider the datasets public asset, which should not be sold, have opposed the pricing of the datasets. Government solely sponsors the department and considering the present economic situation, it is only proper that a fair share of the production cost be transferred to consumers.

Data sharing and integration with its concomitant sharing of cost and benefits, as implied above, cannot be overemphasized in an SDI. Participation by all stakeholders in formulating enforceable policies is crucial in SDI creation and maintenance. Also strong political support is an added advantage.

### ***INSTITUTIONAL ARRANGEMENTS***

Spatial data management in Lesotho, like in most Africa continues is still a fragment process with little co-operation among different agencies. The flow of information between ministries and departments is not up to expectation. However, deliberate efforts of nurturing cooperation are being initiated. One such example is the Agriculture Policy and Capacity Building Project (APCBP). The Ministry of Agriculture Cooperative and Land Reclamation and the Ministry of Local Government in partnership with the private sector and some NGOs are implementing this project, whose main objective is to reduce poverty.

The primary development objective of the Government of Lesotho is poverty reduction. Improving security of tenure has been identified as crucial for poverty reduction. Whilst poverty is a phenomenon of both rural and urban areas, majority of people reside in rural areas and agriculture continue to be the mainstay of the people. Thus strengthening of property

rights and security of tenure (by making current and accurate land information available) will:

- Serve as incentive for long-term investment for improvement and land use;
- Reduce transaction cost and allow efficient transfer of property;
- Make access to credit easier; secure land being used as collateral; and
- Improves land tax collection and foster rational use of land by reducing speculation.

APCBP has four main components:

- Sector Strategy and Management being implemented by the Ministry of Agriculture;
- Agricultural Support Services; being implemented by the Ministry of Agriculture in conjunction with interested private sectors and NGOs;
- Land Management and Administration; being implemented by the Ministry of Local Government, and
- Change Management Processes, which is implemented jointly by both ministries.

Amongst the major achievements of the APCBP are:

- A white Paper on Land Policy;
- Decentralization of Land Administration to District Levels;
- Development of Databases for National Land Management Information Systems;
- Bringing together the Physical Planning Division of LSPP (under Local Government) and Land Use Planning Department of Ministry of Agriculture under the Ministry of Local Government. This will take effect from 1<sup>st</sup> April 2002.

- Transfer of Deeds of Registry from Ministry of Law and Constitutional Affairs to the Ministry of Local Government. This is currently taking place;
- Building of Capacity in both ministries.

The above achievements demonstrate what can be achieved in the development of spatial data infrastructure when good institutional arrangements are operational. The people and Government of Lesotho acknowledge with gratitude the generous contributions of the various donor agencies who made these achievements possible. This goes to show that institutional arrangements extend beyond national borders and that international institutions have a role to play in the development of SDIs in developing nations.

There is, however, no substitute for local initiatives in promoting cooperation among various stakeholders. In Lesotho an inter-sectorial body, the Committee for Environmental Data Management (CEDEMA) has been established and its terms of reference include:

- To promote a culture of environmental data exchange;
- To advise on issues of environmental data exchange;
- To establish data quality standards.

Lesson so far learnt by CEDAMA is that availability and accessibility of data is not enough, this must be backed by policies and standards with enforceable legal status for addressing technical, social, and economic issues.

### ***STATUS OF DATASETS***

There is a realization in most African countries that the use of computers in spatial data management necessitates the availability of data in digital formats. This implies the conversion of existing hard copy data sets into digital forms and the production of new digital datasets. Dale (1999)<sup>1</sup> observed that the collection of new digital data and the conversion of old

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<sup>1</sup> Dale, P. (1999) Is technology a blessing or a curse in land administration? Bathurst, Australia.

records into digital forms are the most time consuming and expensive task in building a modern land administration system. Despite these odds, Lesotho is in the process of building up digital datasets, which are fundamental for successful development of SDI.

The Mapping agency in Lesotho has completed the production of large-scale (1:2500) digital mapping and orthophoto imagery for the urban areas. Databases are also being developed for:

- Digital Orthophotos;
- Digital line mapping;
- Cadastre;
- Lease;
- Shelter;
- Finance.

The digitization of the 1:50000 topographic maps covering the whole country have not yet been carried out for lack of resources. Data capture for the creation of metadata is also on going.

National spatial data infrastructure can be thought of as a network of spatial data infrastructure each set up to serve a certain sector of application. Furthermore an application sector may require data from municipal, district or national level and data connectivity and harmonization between these levels. This implies a requirement from data at different resolution or scale. Spatial integration of the data is based on consistent geometric referencing system and on reasonable compatibility in the resolution of different datasets. (Groot 1997)<sup>2</sup>. This means that the same coordinate system must be used for the spatial referencing. Although Lesotho uses the same coordinate system they are based on different local origins and this make data integration difficult. Definition of new datum is still in discussion. The main obstacle being limited human and financial resources.

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<sup>2</sup> Groot, R. (1997) Spatial Data Infrastructure (SDI) for sustainable Land Management ITC Journal 1997 – 3 / 4.

## ***RESOURCES***

Human resource development is essential for successful development of SDIs. The policy, institutional framework and the technical components demand specific expertise and knowledge. This is a major constraint in Lesotho. A major factor in the shortage of qualified personnel is the constant exodus of professional into stronger economies.

APCBP has developed short-term training programmes to capacitate specific training need. For example, training surveyor and planner in the use of Microstation and Arcview. However, for sustainability of SDIs, specific expertise which need long term training are required. The Land Policy Review Commission recommends outsourcing of certain services but again the private sector need to be capacitated and equipped to be able to carryout such missions.

## **CONCLUSIONS**

Land is a scarce and extremely important resource, especially in Lesotho, that it is absolutely imparative that every decision made concerning any piece of land should be based on accurate information. The development of national spatial infrastructure will make such information available to decision-makers. The road will not be easy, but will a strong political support, participation of all stakeholders and partnership with international community SDI will soon be operational in Lesotho.