

# Geo-information Management

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Framework data relating to cadastre, topography, soil, land use cover, hydrography, geology and transportation are essential to enable government at all levels to govern. Framework data provide information on people and the land where they live and work; on the location of administrative boundaries and objects such as buildings and roads; on soil types and pollution; on ownership and land tenure; on the value and use of land; and on geology. Such data can help governments to determine how to deal with land in their policies in order to reduce poverty, achieve sustainable settlement goals and manage natural resources.

The processes of producing, providing, using, maintaining, exchanging and sharing these data are complex in nature. Large data volumes have to be managed using geographical information systems (GIS) and database management technology. The same holds true for foundation data (geodetic control, national digital elevation models, ortho-imagery and topographic templates).

The custodians of framework and foundation data are cadastres, national mapping agencies, geological surveys, soil surveys, ministries, land use planning institutes and large municipalities. In many countries the institutional settings and organisational structures of geo-information providers leave much to be desired. Many organisations active in the business of providing foundation or framework data, or in the business of land administration, feel under pressure to improve their performance. Organisations have to change.

## Common problems

Some common problems facing organisations today are given below, and no doubt will be instantly recognisable.

- Data sets are incomplete, out of date or unavailable. How can an efficient strategy be developed to complete the framework data sets?
- The process of maintaining data is slow, cumbersome and complex. How can an efficient and effective maintenance process be designed?
- There are thousands of paper maps within the organisation. How can the map contents be computerised?
- Customers complain about delays and other performance problems in land transactions. How can performance be improved?
- There are several framework spatial data sets (possibly duplicated) throughout the country. How can these data sets be integrated? Is there a way to facilitate their shared use?

These courses are specifically for organisations that want to deal systematically with these problems.

## What will be achieved?

The goal of these courses is to strengthen the management capacity of organisations committed to change. Research and operational capacity are both required. Research capacity is required for developing the land and information policies within public administration (central and/or de-centralised level) and for identifying appropriate geo-information provision systems. Operational capacity is required for implementing such systems in specific institu-

tional settings. The challenges are:

- to organise business processes that support the availability of, and accessibility to, geo-information in the right place, at the right time and for the right person
- to create and maintain data models and databases from which information can be extracted, processed and shared by many stakeholders at any given time.

As regards the development of land markets, it is important that cadastres offer transparent procedures for land transfer, inexpensive mechanisms for land transfer and delivery, and sound, easily accessible land information. The same is valid for the production of other framework and foundation data.

Improvement in performance entails structural attention to customer needs and requires a new approach to the management of large-volume spatial data sets. Strategies have to be developed and implemented to provide products that better satisfy user demands. Acquiring computers and software is not enough. Organisations need a critical mass of well-educated technical specialists, as well as geo-information managers who can match appropriate information and communication technology (ICT) to the business of large-volume geo-information provision within specific institutional settings. These issues lie at the very core of the Geo-information Management programme. Course participants learn how to harness ICT technology for the purpose of large-volume geo-information provision, and how to administer this business in the context of a geospatial data infrastructure.



## Course content and structure

These courses are composed of a series of three-week modules. There are three types of module: core modules, programme modules and elective modules.

### Core modules

The core modules deal with the theory, tools and techniques of GIS and remote sensing that are common to all ITC programmes. Knowledge of the principal concepts of spatial data acquisition through remote sensing and spatial data handling with GIS is supplemented by developing the practical skills required to apply these tools. Throughout other modules GIS and remote sensing tools are applied regularly. This provides the opportunity to develop a full understanding of their relevance to geo-information management, and the ability to extract maximum utility from their use.

### Programme modules

In the programme modules, participants learn how to:

- develop and implement strategies to improve the performance of organisations with a mandate to provide large-volume spatial data sets
- develop and implement strategies to align the geo-information business of the organisation with geo-information technology
- apply the principles of GIS, remote sensing, geospatial data infrastructures and land administration (land tenure security, land taxation, land markets, urban and rural land use planning)
- manage the design, testing, implementation and maintenance of a geospatial data infrastructure
- structure and model data and operational processes in a way that allows organisations to respond to customers' information requests continuously, accurately and appropriately
- organise the information production process so that redundancy in data acquisition and storage are reduced; provision of geo-information is accurate, appropriate, in the right place and at the right time; and extraction/analysis of information from spatial data for particular purposes is possible at any given time by any given customer

- identify performance indicators and implement performance measurement in organisations
- recognise the institutional setting of organisations and the impact of this setting on performance, and develop proposals for improvement
- maximise data sharing and minimise data duplication
- develop the coordination machinery to implement a national geospatial data infrastructure
- harness ICT technology to the core business of the participant's organisation within his/her country's institutional setting.

### Elective modules

All ITC participants may choose from a great variety of elective modules offered simultaneously by all ITC's scientific departments. Two such electives are scheduled for the PM and MSc courses. Examples of modules on offer include Geo-Statistics, Network Information Systems, Decision Support Systems and Multicriteria Evaluation, Project Planning, Advanced GIS and Remote Sensing.



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