Final Report for Framework Contract, Lot-1/Phare-Albania-Land Use Policy (AL 980502)

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Introduction

This report compiles documents that were produced during the mission to prepare the Terms of Reference (ToR). for the Albanian Land Use Policy Project. In order to follow the pre-defined structure of the ToR these documents were not – or only partially - include into the ToR.
Nevertheless, to preserve the information collected during the mission, the foll owing documentation has been prepared by the consultants:

I. Land Use - An Introduction
II. Technical Components of a GIS to Support Land Use Policy in Albania - A Long Term Perspective
III. Proposal for a Standardised Database Containing Information about Available Spatial Data, Products and Services of Projects and Institutions in Albania (Metadatabase)
IV. Results of the Questionnaire Survey to Assess the GIS Capacity of Albania
V. Address List of Institutions and Persons Involved
VI. Periodical Report of Activities

I
Land Use

Anthropological Aspects of Land Use

Land use is the result of a scarcity of land. In a global context, and even when regarded per continent this scarcity has generally been relative. Sufficient land of some kind was available, but originally ferti le land producing sufficient fruits of nature for human sustenance without systematic land use became scarce many thousands of years ago on most continents.

This scarcity may provoke two kinds of reactions in human beings, both of which may be considered c ultural responses. One response is to find new land, which still provides sufficient natural sustenance; the other is to put some effort into primeval land management to obtain the needed foodstuffs and materials at the same locality, thus leading to production of agricultural crops. The need for the latter is further enhanced by the nature of the land, which contains many natural barriers, and by the increase in world population, which has led to the establishment of many barriers in human society.

Some Basic Concepts

Land use is any kind of permanent or cyclic human intervention to satisfy human needs, either material or spiritual or both, from the complex of natural and artifactial resources which together are called **"land"**. In this sense, true nomads with no fixed habitat do not practice land use; they do not systematically apply their energies to any specific tract of land, and they themselves are a natural part of an ecosystem, as are other living organisms.

Land carries ecosystems; land use is th e application of human controls, in a relatively systematic manner, to the key elements within any ecosystem, in order to derive benefit from it. Man, although an inherent part of the ecosystem in which he lives, places himself to some extent outside the system and tries to manipulate it. He may do this in a very intensive manner, as is seen in the paddy cultures of Asia or in the horticultural cultures of Western Europe, or in a very extensive manner, e.g. the semi -nomadic peoples of Africa. Hunting whic h is practised as systematic game-cropping on specific areas of land falls into the category of land use. Although it is often the most extensive (low input) form of land use, it fulfils the essential qualification that man systematically applies his tech nological know-how to derive the required benefits. The same holds true for wildlife conservation, carried out systematically either for purposes of recreation or because man perceives that he cannot exist without obtaining a sufficiently steady state in his cultural ecosystems.

Land, being the carrier of those ecosystems which provide the most benefits to mankind, is the over -all natural resource. A resource is there to be used, and use takes place in specific areas and at specific localities. Although land may be viewed from a broad, holistic concept in natural science, its use always involves specific surface areas; land is therefore a truly geographical concept.

The land as we see it today is in many areas the result of a combination of both its nat ural genesis and the human influences which have been brought to bear on it in the past and of those which are still active in the present. The human influences may be the result of positive human action, such as the construction of polders with dikes and pumping stations; it may also be the result of human negligence or lack of knowledge and foresight, as is seen in many severely eroded areas of the world and in areas covered by human, mainly industrial, refuse.

Land is a dynamic concept; it carries ecosy stems, but is itself also a part of these ecosystems. One of its main components, the soil, is itself a complex ecosystem containing animals and plants of different sizes and activities. Natural processes occurring in the land derive energy from the sun as well as from mineral and biological sources. Relief, which is one source of energy, i.e., the energy provided by differences in height, is a specific attribute of the land surface. Land, although tending towards a steady state, is therefore never truly stable. The land, viewed as landscape, as observed today by both visual and other methods of perception, may achieve near stability from certain points of view, but this stability is the result of complex interactions of a multitude of phenomena and proce sses. We try to use this for our own ends and hope to induce those kinds of near-stability which will benefit us most on a long -term basis.

The best definition of land therefore is one which involves the geographical aspects of "a tract of land" and reads: *"A tract of land is defined geographically a specific area of the earth's surface; its characteristics embrace all reasonably stable, or predictably cyclic attributes of the biosphere vertically above and below this area including those of the atmosphere, the soil and underlying rocks, the topography, the water, the plant and animal populations and the results of past and present human activity, to the extent that these attributes exert a significant influence on present and future uses of the land by man."* (From BRINKMAN and SMYTH, 1973, and CHRISTIAN and STEWART in REY et al., 1968.).

This definition obviously includes all land resources, both natural and man -made, of a clearly permanent or cyclic nature. Vegetation and animal populations, both natural and man-induced, are definitely included.

Permanent artificial structures such as dikes, canals, metalled roads or stable terraces are also considered a part of the land. Several institutional factors, however, are not included. Thus, a distinction must he re be made. The concept of land as a natural resource does not include the institutional aspects; scientists adhering mainly to this conceptual approach prefer to include institutional aspects with the land utilisation type. Land as a "tract", i.e. as a geographically defined specific area, does include the permanent or cyclic institutional attributes. Thus, the general field pattern and the system of ownership of a particular tract of land are attributes of the land itself, because they are relatively permanent. Whether a particular individual is at a certain moment the owner of a tract, which may be a subdivision of the above-mentioned one, is not an attribute of the land, because in many social systems ownership may be changed by a simple deed. National and administrative boundaries, also relatively permanent, are attributes of the land as well.

In land development planning as well as in environmental management, these attributes often are highly significant they offer both resources and limitations whic h may have to be adapted by rural reconstruction, in order to use the land to its best advantage.

The concept of "land use" is often considered a relatively stable subject, related mainly to the use to which the land in a certain region at a certain time is put. One might infer this, for example, from the World Land Use surveys made under the aegis of the International Geographic Union and under the guidance of the late Sir Dudley Stamp, although the latter certainly did not mean this to be concluded from his work.

Land use is the result of a continuous field of tension created between available resources and human needs and acted upon by human efforts. Some resources - climate and relief - are not readily responsive to human intervention and therefore ind uce a tendency towards stability. Other resources - vegetation, water and soil - are obviously responsive to human intervention and make development, sometimes even over-development, leading towards degradation, possible. Human societies and human needs s how tendencies towards stabilisation as well as towards growth and development; their main effect, during the twentieth century, has been to promote growth and development.

Even when a new stability, leading to a better environment, is sought, human effort for changes in land use is often urgently needed. Any text on land use will therefore be concerned with the changes in land use as well as with the means for effecting them. A text on land use is therefore a text on actual as well as on potential land use. Because both types must be based on a careful evaluation of land resources, land evaluation is a principal subject for consideration.

Land use is carried out in many different ways. The broadest categories include:

A. Rural land use in its widest sen se, including agriculture, forestry and game-cropping as well as wildlife conservation and the development and management of recreation grounds;
B. Urban and industrial land use, including towns, villages, industrial com plexes, highways and mining activities.

In the present text, the emphasis is placed on rural, and more specifically, on agricultural uses of the land. In most parts of the world, however, all kinds of land use are becoming increasingly interrelated. Periodical references will therefore al so be made to non-agricultural land uses.

Agricultural land use as such, including horticulture, grazing and forestry, is already a very diversified activity. To cope with this, a classification into land utilization types has been found to be effective. In principle, this concept is also applicable to non-agricultural uses.

Land use systems, whether they have been named production, agricultural, farming, non-agricultural, recreational, urban, or any other kind of land use systems are integral systems an d their purposes will include physical as well as social and economic considerations. Evaluating the performance of such systems needs to be based on an understanding of all underlying constituent processes and requires a synthesis of several disciplines such as agronomy, soil science, hydrology, economics. In view of the complexity of land use systems and the complicated interactions that occur between the various constituents of land use it will be difficult to take full account of the variation of each constituent in multidisciplinary farming systems research.

Land evaluation contributes to the solution of this problem by carrying out a preliminary and partial but very systematic analysis of the variability of the physical land conditions and its infl uence on the performance of present and alternative land use systems, in such a way that its results can be easily absorbed by farming systems research and can ultimately serve an optimal land use planning.

To this end, accepting the risk of being criticis ed for over-simplification, the land use system has been subdivided into two constituent parts or subsystems: the physical land conditions and the use itself. The latter subsystem *is* key-named *"land utilisation type"*.

An attempt to treat the process of land evaluation systematically against the background of a land use system (LUS) which has been subdivided into a physical land constituent mostly described by land evaluators in terms of land (mapping) units (LU), and land utilisation type (LUT):

LUS	
LU	**LUT**

In this way it should become possible to predict the performance of present and alternative land use systems representing different land units/land utilisation type combinations, taking into full account the differences and similarities between th e land units identified during the land resources studies. In the *Framework for Land Evaluation* (FAO, 1976) the LUT is considered to be the subject of land evaluation whereas land units the object of land evaluation.

A land utilisation type (LUT) is a s pecific way of using the land, actual or alternative, described for the purpose of land evaluation in the following terms or key attributes (1) produce (e.g. kind of crop, (2) labour, (3) capital (4) management, (5) technology, (6) scale of operations. It is a broadly generalised equivalent of the management factor. The land utilisation type is a technical organisational unit in a specific socio -economic and institutional setting, and related to other similarly selected land utilisation types.
A land map ping unit (LU) is an area of land demarcated on a map and described in terms of land properties and/or qualities.

Sources: A.P.A. VINK "Land use in advancing Agriculture"
K.J. BEEK "Land Evaluation for Agricultural Development"

II
Technical Components of a GIS to support Land Use Policy in Albania - A Long Term Perspective

1. What is Land Use Policy?

Land Use Policy requires a profound Land Use Planning. Land Use Planning means the systematic assessment of …

?? physical,
?? social and
?? economic factors

in such a way as to encourage and assist land users in selecting options that increase their productivity are sustainable and meet the needs of society. This is a long term challenge that also requires an appropriate GIS infrastructure.

Conclusion: Land Use Planning has to consider ALL spatial information of a country to support Land Use Policy in a complete way!

2. What is a GIS?

GIS is a technical system that is composed of five main components:

?? Hardware (PCs, Workstations and Server, CD Burner, Backup Systems etc.)
?? Software (Operating System, Raster- or Vector GIS, Network Systems, etc)
?? Methods (linking and combining data, interpolation of punctual data etc.)
?? People (GIS operators and users)
?? Data (maps, tables, statistics, photos etc.).

A GIS will collect and process raw land data into land information. The generated information – not the raw data – will support political decisions, whereas the completeness of the information is directly influencing the quality of the decisions to be made.
The potential of a modern GIS network goes beyond the classical functions of a stand alone GIS. Only the network functionality of a GIS will enable the user to process and display updated geo-spatial from different data providers in real time.
To use the whole potential of such a GIS all components have to be well developed and established within the administrational system of the political decision makers. This includes the technical infrastructure (Internet server, WorldWideWeb, ftp, e-mail, air-conditioned computer rooms, etc.) used to establish the GIS, the technology to run the system (e.g. backup systems, secure network systems, an extendable database, etc.) and well trained people to operate, maintain and use the GIS.

Conclusion: A GIS is more than a simple computer program! The potential of a GIS to support Land Use Policy depends on its capability to link ALL spatial data of a country in order to display, process and derive new thematic information.

3. Technical Cornerstones of a Land Use GIS

In order to generate appropriate and complete spatial information for political decision makers…

?? The GIS has to provide an infrastructure which is open for all relevant land use information in Albania, like geological data, demographic data, economical indices and statistics, etc.

?? The GIS has to use state of the art technology (hardware and software)

?? The GIS has to provide a network functionality using the Internet and/or Intranet infrastructure. It has to be linked to permanently updated data. It is recommended that the description of the data is stored in an open Metadata base. This database has to contain a link (active hyperlink or address of the responsible data provider) to the digital format of the information (e.g. shape files, dbf tables etc.).

?? The data description (Metadata) has to be done according international Metadata standards like the Dublin Core or ISO/TC211.

?? The spatial data has to fulfil spatial standards to be defined by the project in co-ordination with all data providers involved. Concerning the geometrical accuracy an error tolerance or threshold can be defined.

4. Scenario Infrastructure of a GIS for Land Use Policy in Albania:

Best Case

?? Central Internet Server with Metadatabase and/or a central data archive under the direction of the government, the database could be managed and operated by the Ministry of Agriculture and Food (MoAF) or alternatively by a private GIS and Computer Service in Tirana.

?? A GIS by ESRI connected to the national spatial data archive, managed and operated by GIS/LandUse specialists under the direction of the Ministry of Agriculture and Food (MoAF).

?? GIS Nodes at the Institutes under the MoAF and at other relevant data providers (ArcView, Microstation Graphics, AutoCad Map etc.)

?? Responsibility for data quality remains at the data providers.

?? Introduction of GIS standards according the international standards of the OpenGIS consortium (file formats, data documentation, data accuracy etc.).

?? Agreement on cartographic standards for Albania (geographic projection, scales, legends, mapping symbols, etc.)

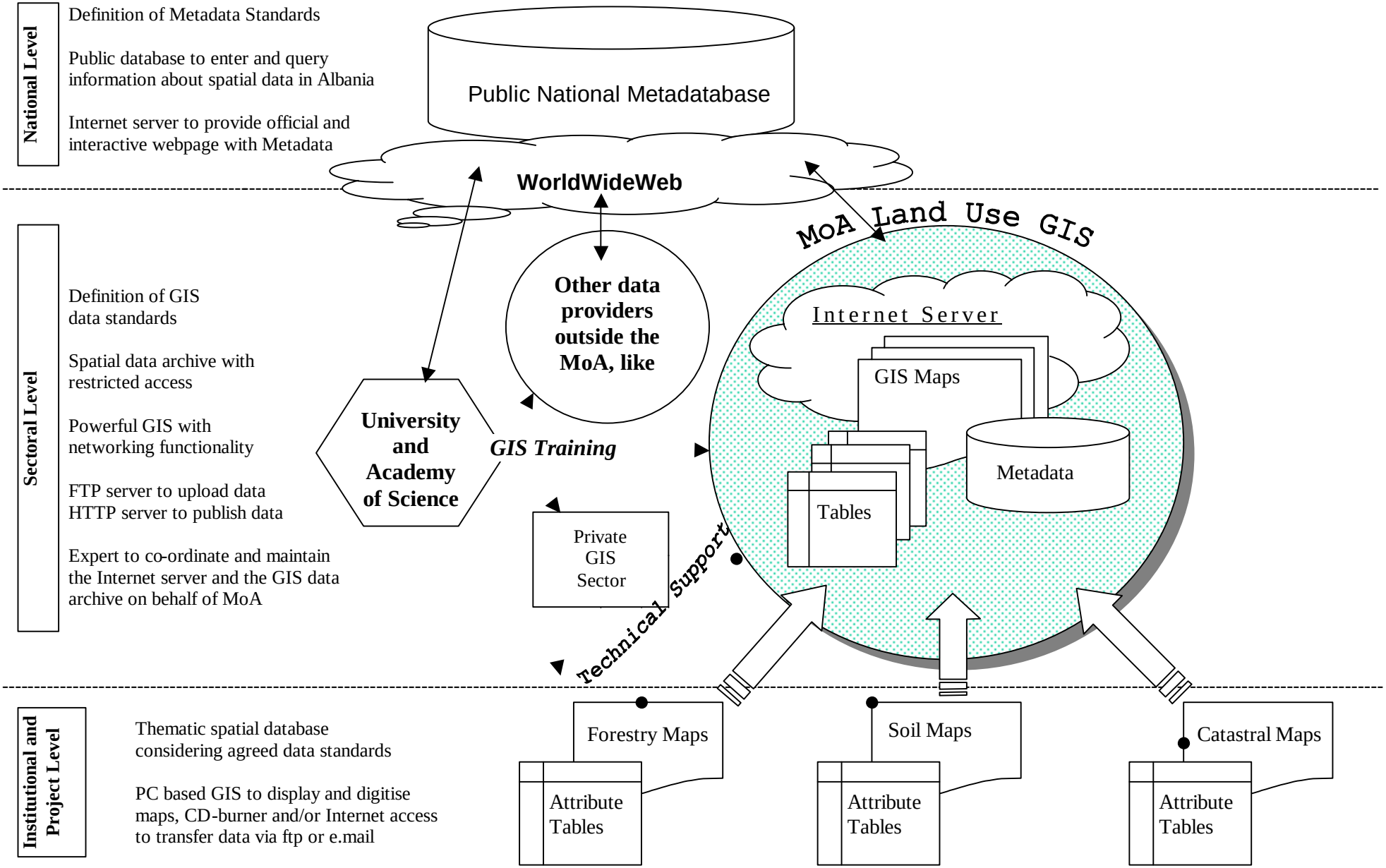
?? Training of people through Albanian GIS experts (by private or university or state institutions), and foreign land use planners.

?? Stimulating the private GIS sector in Albania

?? The planning is initiating a long term development of a GIS for land use policy and is NOT following short term objectives like high investments in hard- and software without considering human resources and administrational constraints ect..

The following diagram tries to illustrate the concept of a proposed GIS infrastructure:

Technical Components of a Land Use GIS for Albania



5. Cost Breakdown for an alternative GIS Infrastructure

System Com-ponents	Soil Research Institute				Forest and Pasture Research Institute				Central GIS Node of MoAF			
	Software	Euro	Hardware	Euro	Software	Euro	Hardware	Euro	Software	Euro	Hardware	Euro
Input and Digitizing Unit	PC ArcInfo Update of existing PC ArcInfo Versions is desirable	4000	Fully equip. PC Monitor A2 Digiboard A4 Scanner Upgrade (RAM) and repair of the 3 existing PCs and printers	2000 1000 4000 500 1500	PC ArcInfo	4000	Fully equip. PC Monitor A2 Digiboard A4 Scanner Printer	2000 1000 4000 500 400	PC ArcInfo	4000	Fully equip. PC Monitor A2 Digiboard A4 Scanner Printer	2000 1000 4000 500 400
	WindowsNT/2000 Server	700			WinNT/2000 Server	700			WinNT/2000 Server	700		
Output and Processing Unit	ArcView 3.2 update	500	Fully equip. PC Monitor A0 Plotter Printer	2000 1000 6000 400	ArcView 3.2	1200	Fully equip. PC Monitor A0 Plotter Printer	2000 1000 6000 400	ArcView 3.2	1200	Fully equip. PC Monitor A0 Plotter Printer	2000 1000 6000 400
	Spatial Analyst update	1000			Spatial Analyst	2500			Spatial Analyst	2500		
	3D Analyst update	1000			3D Analyst	2500			3D Analyst	2500		
	Network Anal. update	500			Netw. Analyst	1500			Netw. Analyst	1500		
	Windows NT/2000 professional	300			WinNT/2000 professional	300			WinNT/2000 professional	300		
Net-working, Database Manage-ment, Communi-cation	Windows2000 Office with MSAccess2000 WSFTP, Netscape etc.	800 200	Modem or ISDN Telephone, Fax	200 500	Win2000 Office with Access2000 WSFTP, Netscape etc.	800 200	Modem/ISDN Telephone, Fax	200 500	WinNT/2000 Serv. Win2000 Office with Access2000 WSFTP, Netscape Allaire Home Site, MSInterDev etc.	700 800 200 500	PC Monitor ISDN Card Telephone, Fax	2000 500 200 500
System Security			Central UBS Backup System	500 500			Central UBS Backup System	500 500			Central UBS Backup System	500 500
SubTotal		**9000**		**20100**		**13700**		**19000**		**14900**		**21500**
TOTAL												**98.200.-**

III
Proposal for a Standardised Database Containing Information about Available Spatial Data, Products and Services of Projects and Institutions in Albania (Metadatabase)

1. Introduction

During the meetings with the responsible managers of spatial data in Albania, we were discussing a way to describe the data that is available at their institutions. We proposed a wide spread and commonly accepted form to describe the content of data (=Metadata), the Dublin Core.
Using an accepted an well known standard facilitates the communication between the institutions and the beneficiaries of their work. The exchange of data will become easier and the search for specific products more efficient. Using a standardised form, could even make the institutions' spatial products "searchable" on the Internet, if they want to publish it online.

Presently, scientists are discussing the suitability of different standards on an international level, besides the Dublin Core there are e.g. the US american FGDC or the ISO/TC211 standards. The Dublin Core is an international initiative coming from the library and publishing communities. It is based on consensus, it is entirely open and it is increasingly being looked at by a wide range of industries. The Dublin Core contains most of the describing fields of the other standards, however it is up to the responsible data managers to decide for the appropriate form to describe their data.

Finally it is not the choice for or again a certain standard, but it is the national agreement on a commonly used standard needed for Albania to achieve an efficient use of existing and new data!

The following the web pages discuss the different standards:
http://purl.org/DC (about the Dublin Core Initiative)
http://www.standardsinaction.org/gismetadata/ (about GIS Metadata)
http://www.ec-gis.org (unified portal for Geographic Information and GIS resources in the EC)
http://www.fgdc.gov/metadata/contstan.html (the U.S. Federal Geographic Data Committee)
http://www.statkart.no/isotc211/pow.htm (the ISO/TC 211 should bring together both US and European standards).

Following pages describe the practical use of the Dublin Core Metadata set.

2. The Dublin Core in Practice

Following Dublin Core database fields have been used by the author to support the development of a European Forest Information and Communication System (EFICS), which will provide European forestry data through the Internet. The table below describes the frame of an interactive web page, which is programmed in HTML, JavaScript and ASP (Visual Basic) and which allows the Internet user to enter information into an Online Database (MS-Access) and query this database.
Mandatory fields to be filled in are marked with two asterisks (**). Recommended fields are marked with one asterisk (*).

Dublin Core Field	***Description***
Title	Please enter the full Title of the work/product. Typically, a Title will be a name by which the resource is formally known.
Creator	Please enter the full name of the creator (person, working group, institutet etc.) or an entity primarily responsible for making the content of the resource. Examples of a Creator include a person, an organisation, or a service. Typically, the name of a Creator should be used to indicate the entity.
Subject (keywords)	Please enter two or three keywords that describe the topic of the content of the resource best. Typically, a Subject will be expressed as keywords, key phrases or classification codes that describe a topic of the resource.
Description	Please describe the work/product in detail. Description may include but is not limited to: an abstract, table of contents, reference to a graphical representation of content or a free-text account of the content.
Publisher	Please enter the name of an entity responsible for making the resource available like the publisher or the publishing organisation/institute. Examples of a Publisher include a person, an organisation, or a service.
Contributor**	An entity responsible for making contributions to the content of the resource. Please enter your name, address and/or e.mail.
Date**	Typically, Date will be associated with the creation or availability of the resource. Please select a year associated with an event in the life cycle of the resource.
Product Type	The nature or genre of the content of the resource. Type includes terms describing general categories, functions, genres, or aggregation levels for content. Please select a type from the list. *Examples of listed product types are:* <option value="Text">Text, Report, Memorandum</option> <option value="Map">Map </option>, i.e. paper maps and digital maps <option value="Image">Image </option>i.e. satellite images, aerial photos etc. <option value="Software">Software </option>, i.e. software, scripts, macros etc. you have programmed <option value="Sound">Sound </option> <option value="Interactive Resource">Interactive Resource </option>, like interactive html pages <option value="Service">Service </option>, like a service your institute offers to customers <option value="Collection">Collection </option> <option value="Event">Event </option>, like a conference, symposium etc. you're organising

Digital Format	Typically, Format may include the media-type or dimensions of the resource. Format may be used to determine the software, hardware or other equipment needed to display or operate the resource. Please select the adequate format from the list. <option value="[application] gis"> <option value="[application] grd "> <option value="[application] http"> <option value="[application] img "> <option value="[application] lan"> <option value="[application] msword"> <option value="[application] pdf"> <option value="[application] shp(ArcView Shape file)"> <option value="[application] rtf"> <option value="[application] vnd.ms-excel"> <option value="[application] vnd.ms-powerpoint"> <option value="[image] bmp"> <option value="[image] gif"> <option value="[image] jpeg"> <option value="[image] jpg"> <option value="[image] tiff"> <option value="[image] vnd.dwg"> <option value="[image] vnd.dxf"> <option value="[message] http"> <option value="[model] mesh"> <option value="[model] vnd.dwf"> <option value="[model] vrml"> <option value="[text] html"> <option value="[text] plain ASCII - Text"> <option value="[text] rtf"> <option value="[video] mpeg"> <option value="[video] quicktime">
Hyperlink Identifier*	Please enter an URL (ftp:// or http://) that links to the product. This link will be shown in the query results as an active link, which allows users to get immediately linked to the work/product.
Language	A language of the intellectual content of the resource. Please select the adequate language from the list. *Examples of listed items are (please see the DublinCore.mdb file):* <option value="al">Albanese </option> <option value="en">English </option> <option value="es">Spanish </option> <option value="de">German </option> <option value="fr">French </option> <option value="it">Italian </option>
Covered Region or Country	The extent or scope of the content of the resource. Please select the adequate country or region from the list. It might be advisable to refine the list and add the Albanian Districts, Quarku and Komunes. *Examples of listed items are:* <OPTION VALUE="Albania">Albania</OPTION>< OPTION VALUE="Albania-Tirana-Preza">Preza Komune</OPTION> <OPTION VALUE="Austria">Austria</OPTION> <OPTION VALUE="Belarus">Belarus</OPTION> <OPTION VALUE="Belgium">Belgium</OPTION> <OPTION VALUE="Bosnia and Herzegovina">Bosnia and Herzegovina</OPTION> <OPTION VALUE="Bulgaria">Bulgaria</OPTION> <OPTION VALUE="Croatia">Croatia</OPTION> … etc. <OPTION VALUE="Yugoslavia">Yugoslavia</OPTION>
Source	A Reference to a resource from which the present resource is derived. The present resource may be derived from the Source resource in whole or in part.
Relation	A reference to a related resource, e.g. another hyperlink to a related work, product or project. Comment: Recommended best practice is to reference the resource by means of a string or number conforming to a formal identification system, like an URL address (http://).

Rights	Information about rights held in and over the resource. Comment: Typically, a Rights element will contain a rights management statement for the resource, or reference a service providing such information. Rights information often encompasses Intellectual Property Rights (IPR), Copyright, and various Property Rights.
Upper Left X	Please enter the longitude of upper left corner of bounding rectangle, expressed in decimal degrees east (+) and west (-) of the Greenwich Meridian, like e.g. +8.1226. To separate the decimals please enter a dot ("."). If you don't know the exact co-ordinates you MUST enter "0" to avoid an error message!
Upper Left Y	Please enter the latitude of upper left corner of bounding rectangle, expressed in decimal degrees north (+) and south (-) of the Equator, like +48.3521. To separate the decimals please enter a dot ("."). If you don't know the exact co-ordinates you MUST enter "0" to avoid an error message!
Lower Right X	Please enter longitude of lower right bounding rectangle, expressed in decimal degrees east (+) and west (-) of the Greenwich Meridian, like e.g. +12.1226. To separate the decimals please enter a dot ("."). If you don't know the exact co-ordinates you MUST enter "0" to avoid an error message !
Lower Right Y	Please enter the latitude of upper right corner of bounding rectangle, expressed in decimal degrees north (+) and south (-) of the Equator, like +50.4231. To separate the decimals please enter a dot ("."). If you don't know the exact co-ordinates you MUST enter "0" to avoid an error message !
Coverage_ID	More detailed information about x,y,z,t co-ordinates and structure of the coverage, please see http://purl.org/DC for a comprehensive discussion on this issue. Following are some examples: coverage_periodName coverage_placeName coverage_x. The DC.coverage.x, .y, .z, .t options handle the dimensionality of spatial and temporal extent coverage_x_min, DC_coverage_x_max coverage_y, DC_coverage_y_min, DC_coverage_y_max coverage_z, DC_coverage_z_min, DC_coverage_z_max coverage_t, DC_coverage_t_min, DC_coverage_t_max coverage_polygon, DC_coverage_polygon_include, DC_coverage_polygon_exclude coverage_line coverage_3d .The "3d" modifier is required where a complex three-dimensional extent is required coverage_3d_exclude

IV

Results of the Questionnaire Survey

In order to get an overview of the main GIS actors, their activities and available data, the existing hard- and software equipment and the computer skills of the people involved, a survey of all relevant institutions and projects in Tirana had been carried out in January and February 2001.

The surveyed institutions/projects were:

- Soil Research Institute (SRI)
- Forest and Pasture Research Institute
- Military Geographical Institute
- Geographic Studies Centre of the Academy of Science
- Institute for Hydrometeorology
- Geological Research Institute of the Albanian Geological Survey
- Department of Geography of the University of Tirana
- The Immovable Property Registration System (IPRS)
- The World Bank Forestry Project
- The Albanian Watershed Assessment Project

In addition to the discussions led with the institutional authorities a questionnaire was submitted to assess the existing spatial data and human and financial resources of the institutions/projects.

Until the 04.03.01 there was no response from the Watershed Assessment Project and the Dept. of Geography. The questionnaire of the Military Geographical Institute was incomplete i.e. without the list of available maps. From the visits and personal discussions during the survey, the authors are aware that some answers given in the questionnaire are incomplete (see annotations). Nevertheless it must be stated, that the feedback and the response of the survey was very positive, which demonstrates the general interest in this issue.

Below the results of the survey are given, divided into:

I. General information about the institutes and projects
II. Infrastructure and facilities
    a. Internet, email, fax, telephone
    b. External contracts, projects and technology transfers
III. Available data, products and clients
    a. Available maps
    b. Other land information
    c. Computer equipment
        1. Hardware
        2. Software

I. General Information about the Institutes/Projects (" – " = not answered, given answers are cited and have not been changed)

Name of Institute/Project	Questions answered by ….	Amount of staff	Staff with general computer skills	Staff with special GIS skills	Average of last 2 year's budget	Main customers/beneficiaries	Main output (product or services)	Annual income for sold products/services
Soil Research Institute	Klared Dedcj	65	15	6	-	Government and private farms	Projects, services for private farms, studies etc.	1. 000.000 Leke
Forest and Pasture Research Institute	Maxhun Dida	40	8	1	-	Directory of Forest and Pasture	Projects, Plants, Studies, Maps	-
The Albanian Watershed Assessment Project								
Albania – Forestry Project (Worldbank)	Arjan Bare	20	20	2	6.500.000 US$	Directorate General of Forestry and Pasture	Govt. Org.	No, (Public Org.)
The Immovable Property Registration System	Kristaq Qirko	More than 100	50	4	4.000.000 US$	IPRS – Immovable Property Registration System	Index Map for Registration System	Non profit
Dept. of Geography of the University of Tirana								
Geological Research Institute of the Albanian Geological Survey	Kujtim Onuzi	32	27	5	23.000.000 Lek	Government	Geological studies on mineral rocks and industrials, ores 2. Geological Maps of scales 1:25000, 1:50000, 1:10000	About 200.000.000
Institute for Hydrometeorology	Agim Selenica	113	20	0	5.000.000 Lek	Public and Private Organisations	Hydrometeorological Data, Bulletins, Reports and Studies Meteorological Forecasting	2.000.000 Lek
Geographic Studies Centre of the Academy of Science	Albona Zotcj	-	-	5	8500 US$	Public Sector (NGO)	Products	-
Military Geographical Institute	Kol. Dr. Myslim Pasha	80	4	7	34.000.000 Lek	To produce maps and to create national network and triangulation and leveling	Product of maps	4.800.000 leke

II. Infrastructure and Facilities (" – " = not answered, given answers are cited and have not been changed)

Table: II.a

Name of Institute/Project	Internet access	E-mail address	Fax address	Tel. Number
Soil Science Institute	No	Foreseen for march 2001	+355-4-228367	+355-4-228367
Forest and Pasture Research Institute	Yes	ikpk@albaniaonline.net	+355-4-371242	+355-4-371237
The Albanian Watershed Assessment Project			+355-4-	+355-4-
Albania – Forestry Project (Worldbank)	Yes	hakipmu@albaniaonline.net	+355-2-232571	+355-2-27186
The Immovable Property Registration System	Yes	-	+355-4-223296	+355-4-223296, +355-4-231564
Dept. of Geography of the University of Tirana			+355-4-	+355-4-
Geological Research Institute of the Albanian Geological Survey	Yes	hallaci@yahoo.com, lirimhoxha@yahoo.com	+355-4-226597	+355-4-226597 +355-4-228703
Institute for Hydrometeorology	Yes	-	+355-4-223518	+355-4-223518, +355-4-222439
Geographic Studies Centre of the Academy of Science	No	-	-	+355-4-247371
Military Geographical Institute	No	itu@albmail.com	+355-4-363427	+355-4-363427

Table: II.b (" – " = not answered, given answers are cited and have not been changed)

Name of Institute/Project	Name of private companies contracted by the institute/project	Name of ongoing projects, if any	Exchange with universities in Albania	Exchange of geographical data with other institutions	Most urgently needed future resource
Soil Research Institute	No	-	-	-	-
Forest and Pasture Institute	No	-	Forestry Science Faculty in Tirana	MATCOM Project, Watershed Management Project	-
The Albanian Watershed Assessment Project					
Albania – Forestry Project (Worldbank)	GCC, ALBANIA, Vestra Resources, USA	"Forest Info Center" to provide data, starting 01.01.00 until 31.12.02 "Forest Inventory "starting 01.05.01 until 31.12.02	AUT, Forest Faculty	FPRI	Forest Management Plans (operational 25.000), National Forest Inventory (1:200.000, 1:100.000, National Map and Statistics)
The Immovable Property Registration System	No	-	No	No	To create a GIS infrastructure
Dept. of Geography of the University of Tirana					
Geological Research Institute of the Albanian Geological Survey	No	-	For GIS No, for geological problems Yes	No	Collaboration and co-operation with interested Co.
Institute for Hydrometeorology	No	-	Exchange of professors and students with Faculty of Civil Engineering and Faculty of Geography	Exchange of hydrometeorological data and information with National Centre of Geography	Equipments and Measuring Devices and Software for data base management and for hydrological modelling
Geographic Studies Centre of the Academy of Science	-	-	-	No	Re-revaluation of ArcInfo Unix licenses
Military Geographical Institute	No	-	Our specialists go to University of Tirana to give different lectures. The professors of Universities come to us for different problems, the students come to us for practical work	Yes. We exchange geographical data with other institutions	-

III. Available data, products and clients of your institute (all questions and answers were originally in Albanian and have been translated).

Table III a: What kind of maps (or map series) are available?
Please specify the name of the map or the map series, the main content or the theme of the map, the scale of the map, year of production or revision, cartographic projection, paper or digital format. An example how to fill in the table is given in the first table row.

Name of Institute/Project	Name of Map	Content	Scale, 1: ….	*Year*	*Projection*	Format
Soil Research Institute	Cadastral, topographical maps (rural zone)	Topography, land cover, rivers, etc.	25.000	1947 - 1960	Gauss-Krueger	60 x 90 cm in letter Hamer design
Soil Research Institute	Cadastral, topographical maps (rural zone)	Topography, land cover, rivers, etc.	5.000	1960 - 1989	Gauss-Krueger	52 x 60 cm in letter Hamer design
Soil Research Institute	Cadastral, topographical maps (partially)	Topography, land cover, rivers, etc.	2.000	1962 - 1970	Gauss-Krueger	52 x 60 cm in letter Hamer design
Soil Research Institute	Cadastral, topographical maps reduced than existed.	Topography, land cover, rivers, etc.	10.000	1962 - 1980	Gauss-Krueger	46 x 50 cm in letter Hamer design
Soil Research Institute	Incomplete (anno-tation of the author)	Soil maps and maps of previous land use project are not given (annotation of the author)				
Forest and Pasture Institute	Topographical Map of Albania	Dates for spread of main forest kind, based on national inventory dates of forests on year 1969.	200.000	1974	Gauss-Krueger	
Forest and Pasture Institute	Maps of Forestry Arranged and inventory plans	Dates for horizontally and vertically extent for main forest species for the period from 1969 -1990, for about 1.030 miles ha of forestry areas.	25.000	1969 - 1990	Gauss-Krueger	
Forest and Pasture Institute	Forest pastoral maps of districts.	Spread of forests and pastures in district, forest and pasture kind level.	50.000	1973 - 1974	Gauss-Krueger	
Forest and Pasture Institute	Forestall pastoral maps of Albania.	Spread of species, forest economy, surface and dendrometric indicators at economy and district level for an area of 1.040 miles. This is done based on national inventory of forest on year 1984.	200.000	1974	Gauss-Krueger	

Forest and Pasture Institute	Maps of main plants medical ether-oily and taniphere of Albania.	Horizontally spread of medica, ether-oily and taniphere plants at country level, based on national inventory of year 1988.	200.000	1988	Gauss-Krueger	
Forest and Pasture Institute	Project Maps of forestation, forest improvements, hunting, etc.	Spread of work realized in forestation, in forests improvements and hunting in defined areas and districts of Albania.	200.000	1989	Gauss-Krueger	
Forest and Pasture Institute	Hartat e projekteve te pyllezimeve, permiresimeve pyjore, te gjuetise etj.	Japin shtrirjen e punimeve te realizuara ne kryerjen e pyllezimeve, permiresimeve pyjore e te gjuetise ne zona e rrethe te caktuara te Shqiperise	25.000	1989 - 1990	Gauss-Krueger	
The Albanian Watershed Assessment Project	-	-	-	-	-	-
The Worldbank Forestry Project	Forest maps	Forest	25 K	2000	Gauss-Krueger	Arc Info Coverage
The Worldbank Forestry Project	Forest and Land Cover	Land Cover	200 K	1995	VTM (GCO)	Arc Info
The Worldbank Forestry Project	Communal Forest	Forest	25 K	1995 -2001	Gauss-Krueger	Arc View
The Worldbank Forestry Project	Protected Areas	Forest	100 K	2000	Gauss-Krueger	Arc Info
The Worldbank Forestry Project	Forest Damages	Forest	25 K	2000-2001	Gauss-Krueger	Arc Info
The Worldbank Forestry Project	All Topo Maps					Hard Copy
The Immovable Property Registration System	Cadastral, rural maps		2.500	1994 - 2000	Gauss-Krueger	*.DxF AutoCAD 12 (2D)
The Immovable Property Registration System	Town, urban maps		500	1994 - 2000	Gauss-Krueger	*.DxF AutoCAD 12 (2D)
The Immovable Property Registration System	Country, urban maps		1.000	1994 - 2000	Gauss-Krueger	*.DxF AutoCAD 12 (2D)
Dept. of Geography of the University of Tirana	-	-	-	-	-	-
Geological Research Institute of the Albanian Geological Survey	Topographical Maps of Albania	Topography, land cover, rivers, etc	25.000	1983	Gauss-Krueger	(43 x 37) Letter

Institute for Hydrometeorology	Topographical Maps of Albania	Topography, hydrography.	25.000	Different	Gauss-Krueger	Letter
Institute for Hydrometeorology			50.000			
Institute for Hydrometeorology			100.000			
Geographic Studies Centre of the Academy of Science	Topographical Maps of Albania	Izoypses, hydrography Residences, roads, nominations	10.000	1995	Gauss-Krueger	ArcView ArcInfo
Geographic Studies Centre of the Academy of Science	Digitalisation of Albanian Maps only of the Western part of Albania	Izoypses, hydrography Residences, roads, nominations	25.000	1997	Gauss-Krueger	ArcInfo
Military Geographical Institute						

Table III b: What kind of land information – other than maps – do you have?
Please specify the main content of the format (paper format or digital database). The first row of the table shows an example on how to fill in the table.

Name of Institute/Project	Content	Format
Soil Research Institute		
Forest and Pasture Institute		
The Albanian Watershed Assessment Project		
The Worldbank Forestry Project	Parcel Forests List	Access
The Immovable Property Registration System	Owner name	*.DBF
The Immovable Property Registration System	Parcel number	*.DBF
The Immovable Property Registration System	Number of property act	*.DBF
The Immovable Property Registration System	Kind of Property	*.DBF
The Immovable Property Registration System	Surface	*.DBF
Dept. of Geography of the University of Tirana	-	-
Geological Research Institute of the Albanian Geological Survey	(a database in MSAccess is available with geological information) (annotation of the author)	-
Institute for Hydrometeorology	Hydrometeorological dates as: rains, temperature,	Table in Excel file format and other formats.
Institute for Hydrometeorology	humidity, wind, solar radiation, levels and brings of	
Institute for Hydrometeorology	rivers, levels of lakes, of subterranean waters	
Geographic Studies Centre of the Academy of Science	-	-
Military Geographical Institute	-	-

Table III c: Do you have adequate computer equipment to run a GIS?
Table III c 1. Hardware: please specify the number of PCs, Plotter and Scanner do you have.

Name of Institute/Project	PCs	Plotter/Printer	Scanner
Soil Research Institute	Given answers incomplete, GIS laboratory not listed (annotation of the author)	Given answers incomplete, GIS laboratory not listed (annotation of the author)	Given answers incomplete, GIS laboratory not listed (annotation of the author)
Forest and Pasture Institute	-	-	-
The Albanian Watershed Assessment Project			
The Worldbank Forestry Project	2 Pentium III 733 Workstation	HP 750C PLUS (A1)	2 Legal Size
The Worldbank Forestry Project	70 Pentium III 733 PC, WIN. '98	HP 4500 COLOR (A4)	A1 Digitizer
The Worldbank Forestry Project	1 SERVER, 2x P III 600	HP LASERJET (A3)	
The Worldbank Forestry Project		80 Lazer Printers	
The Immovable Property Registration System	30 Pentium III, windows '98	3 A0, HP 250C	1 A0
Dept. of Geography of the University of Tirana			
Geological Research Institute of the Albanian Geological Survey	Pentium II, 260 MHz, Windows95	HP 780 DeskJet	DIN A4
Institute for Hydrometeorology	4 Pentium III, 500 MHz, Windows '98	1 HP DJ 895 Cxi	1 Ofice Jet 1150
Institute for Hydrometeorology	2 Pentium II, 400 MHz, Windows '98	4 HP DJ 610 C	1 AGPA
Institute for Hydrometeorology	2 Server WIN NT	2 HP LJ 4 Plus	
Institute for Hydrometeorology	4 Celeron 500 Windows '98	1 HP LJ 4 L	
Institute for Hydrometeorology	6 486 Windows '95	2 HP LJ 5 L	
Geographic Studies Centre of the Academy of Science	Given answers incomplete, GIS laboratory not listed (annotation of the author)	HP 650C Design Jet	
Military Geographical Institute	3 Pentium I, 100 MHz, Windows '95	1 HP 445 CA, A0	1 IMTEC 3731 C, A0
Military Geographical Institute	2 Pentium II, 166 MHz, Windows '95	2 HP Laser Jet 1100	HP 6300C, A4
Military Geographical Institute	1 Pentium II, 633 MHz, Windows '98	1 HP Laser Jet 1100	
Military Geographical Institute	1 Pentium III, 550 MHz, Windows '98	1 HP Laser Jet 6 L	
Military Geographical Institute	4 Pentium III, 700 MHz, Windows '98		

Table III c 2. Software: please specify Name, Version and Number of licenses of the software you have.

Name of Institute/Project	GIS	Image Processing	Database	Others
Soil Research Institute	Given answers incomplete, GIS laboratory not listed (annotation of the author)			
Forest and Pasture Institute				
The Albanian Watershed Assessment Project				
The Worldbank Forestry Project	PC ArcInfo 35.2	ER-MAPPER (TRIAL)	MS ACCESS 2000	ADOBE PhotoShop 5.5
The Worldbank Forestry Project	ArcView GIS 3.20			
The Immovable Property Registration System	ArcView, version 3.0			
The Immovable Property Registration System	75217			
The Immovable Property Registration System	84178			
Dept. of Geography of the University of Tirana				
Geological Research Institute of the Albanian Geological Survey	ArcView, Version 3.0a, 3 licenses	AutoCAD	MS Access, Version 2.0, 1 license	PhotoShop, Version 5.5, 1 license
Geological Research Institute of the Albanian Geological Survey		Microstation, '95		
Institute for Hydrometeorology		Corel 5	MS Access 2000	1 HM
Institute for Hydrometeorology		PSP 6	1 PPRG	
Geographic Studies Centre of the Academy of Science	ArcInfo ver 7.0 for PC and unix			PhotoShop ver 5.5
Geographic Studies Centre of the Academy of Science	ArcView, Ver. 3.0			
Military Geographical Institute	ArcView, 3.1	AutoCAD MAP 14	MS Access	PhotoShop 5
Military Geographical Institute	1 License	1 License	Version 2.0	1 License
Military Geographical Institute		MicroStation	1 License	