TREES FOR THE FUTURE

Agjencia Pyjore e Kosovës
Agencija za Šume Kosova
Kosovo Forest Agency

Support to forest management planning with GIS

FEBRUARY ISSUE, 2011

The project will continue till the end of 2013.

The project "Support to Forest Management Planning with Geographic Information System", funded by the Norwegian Ministry of Foreign Affairs, started in 2006. Three phases of the project are completed. A fourth phase is just started and will last for 3 years till the end of 2013.

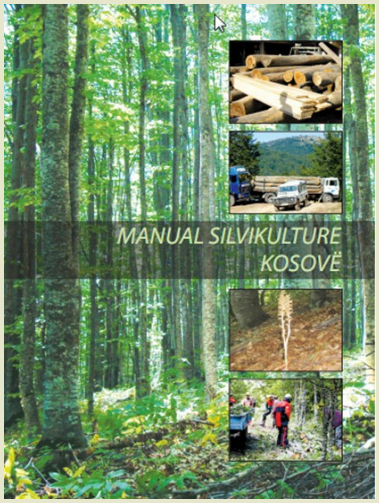
The first phases of the project were focusing how to make forest management plans in Kosovo, based on new technology, and modern principles for forest management. Later on we were focusing implementation of the methods, testing the methodology, capacity building and training of people in making the plans. For the next phase we will still focus on production of forest management plans and improve the methodology, but turn more in the direction of how to use the plan in operational forest management and how to update the forest information. In phase 4 we will also include production of a new national forest inventory for Kosovo, as the last national forest inventory was made in 2002, and such inventories should be repeated every 10 year to measure the development of the forest sector and conditions.

The overall goal for this project is to: *Improve the quality and use of the introduced methodology and technology for forest management planning, and make the professional environment more sustainable regarding competence and size, for the head office and regional offices of KFA, as well as the inspection service of the Ministry.*

The starting point for phase 4 is that we have developed, tested and established a method for forest management planning in Kosovo. New forest management plans are made according to this methodology for approximately 15 % of the forest area. A software for calculating the inventory data and prepare out prints for Kosovo conditions is made, as well as a software for forest management and updating the forest information and maps. GIS technology is introduced, software and hardware for using this technology is provided to the regional offices of KFA. The basic knowledge is established, but further training is needed. A national forest inventory (NFI) was made for Kosovo by NFG in 2002. A revised NFI showing the development of the total forest resources of Kosovo is needed, and will be included in the future work of the project.

New manual for Silviculture

The project has during its latest years focused silviculture measures and forest treatment assessment. For that purpose several training courses have been arranged. The project has also made a manual or field guide for silviculture in Kosovo. This comes as a hand book of 45 pages, which is printed and distributed to employees in Kosovo Forest Agency and The forestry section of the Ministry of Agriculture, Forestry and Rural Development. The manual is available from the project office.



Quoted from the Policy and Strategy Paper on Development of Forestry 2010 –2020, given by the Minhistry of Agriculture, Forestry and Rural development:

"..Accurate information about the status of the forest resources shall always be available. In particular the policy of the Government is to establish and maintain permanent resources for national forest inventories. This information will provide data for monitoring of the forest resource base, policy making and strategic planning by central forest authorities to safeguard the use of wood products in harmony with the development of the forest resource base.

NFG
NORWEGIAN FORESTRY GROUP

Forest management planning in Kosovo

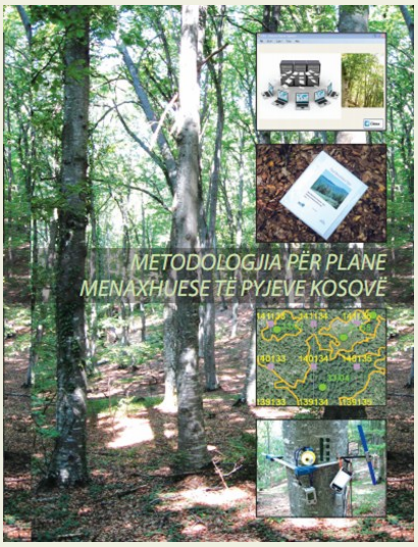
The forests in Kosovo have a great potential for development, improvement and contribution to the GDP of Kosovo. The future estimate of the Forest Sector contribution to the Kosovo GDP ranges between 3-4% of GDP, which is an increase of 50-70% compared to the present value. This is confirmed by the national forest inventory, which implies that the annually allowable forest cut could be raised substantially.

An improved capability in managing and utilizing resources in a cost efficient and sustainable manner in Kosovo urgently calls for upgraded skills of forestry personnel at all levels and introduction of state of the art technology in forest management.

Our project has developed, tested and documented a methodology for making new foerst management plans in Kosovo, based on modern technology and the local forest conditions. The methodology includes use of aerial images for improved efficiency of the field work and accuracy of the forest maps, GIS-technology for storing and analysing the the geographical information and map production, and GPS for navigating in the field and improving the accuracy of the work, and databases and applications for data processing, storing and maintenance.

Comperehensive manuals are made for all stepas in the production line, but special emphasis have been put on the field guide describing all planning operations in the field, and form the basis of the planning system.

In total the project has made new forest management plans for 6 management units, covering in total 28 361 ha, of which 10 752 ha are high forest. In addition the Ministry has provided funding for production of additional management plans made by independant companies, according to the methododology developed in our project, and supported from the project with quality controls and professional advice.



Field guide for froes tmanagemnt planning made by the project

Some key findings

Management unit	Gazetted area (ha)	Area of high forest (ha)	Volume of high forest (m3)	Average volume in high forest (m3/ha)	Total increment (m3/year)	Illegal harvesting, in % of increment.
Deçani	2934	2494	651433	261,2	16464	67 %
Ahishta-Kaçanik	2717	1844	392172	212,7	10541	80 %
Nerodime-Jezerc	6899	3750	767731	204,7	24887	77 %
Radushë	4974	2345	411422	175,4	11437	87 %
Goshicë	2342	67	1702	25,4	2107	87 %
Lugi But	8495	2522	396650	157,3	9940	92 %
Total	28361	13022	2621110	201,3	75376	79 %

A managment plans contains a lot of information collected and produced for the area or management unit, like Forest managment class map, soil map, orto phote map, standing volume and increment for each stand, diameter distribution of the trees and biodiversity information.

Included in this information are estimations of the illegal harvesting that has taken place the last 5 years.

The average extent of illegal harvesting for all management units included, is that **79 % of the annual increment is taken out illegally.**

Som of the management units have an avareage satandig volume in the high forest lower than 200 m3/ha, which is fairly low, compared to a normal or optimal situation at he level of 250 m3/ha. The low standig volumes are mainly due to illegal activities.

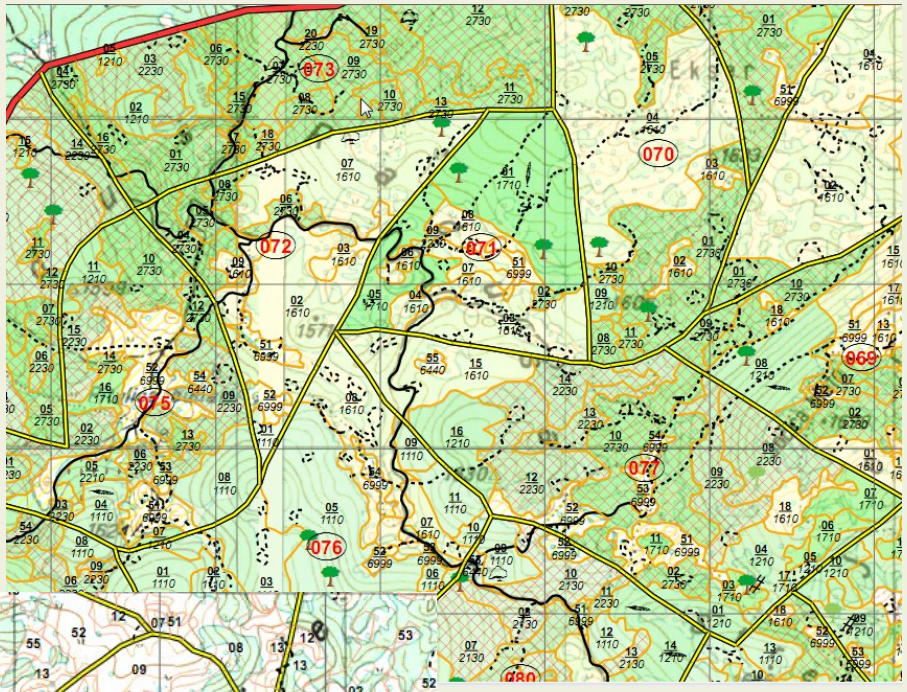
The maps produced are:

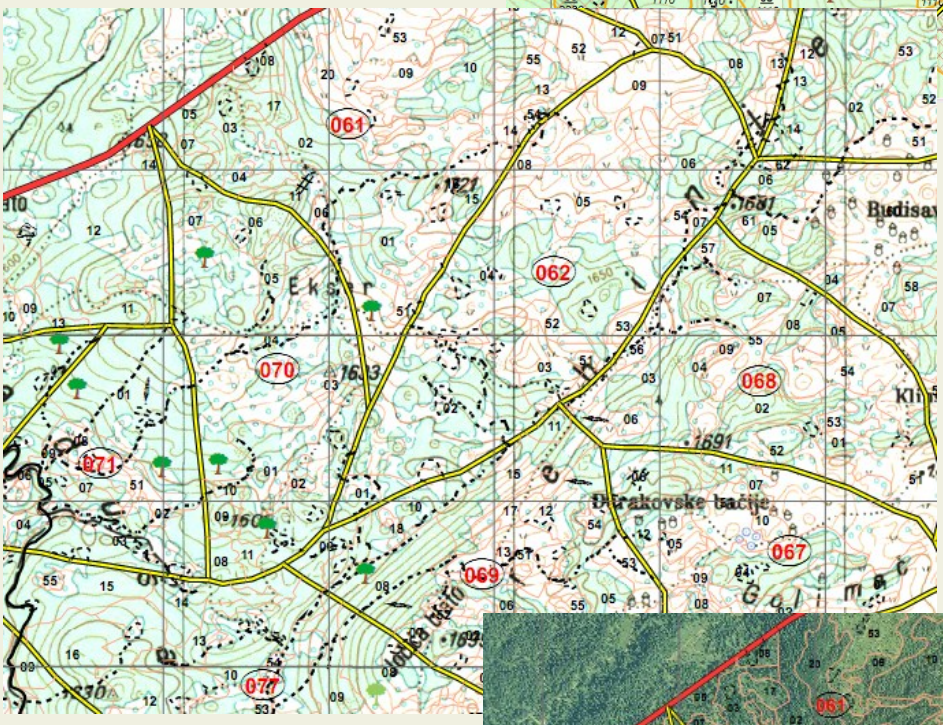
Part of a **Forest Management Class Map**. Normally produced in scale 1 : 15.000.

The small trees indicates biodeversity values.

The dark windy lines are forest roads which are logged with GPS. The dotted lines are tractor roads.

The thick yellow lines are compartement borders.





Part of a **Forest Stand Map**, normally produced in scale 1 : 15.000. This map shows some more of the topographic map information than the Management class map.

Part of a **Orthophoto Map**, showing some other details and information than the maps based on topographic base maps. The orthophoto maps are nomally produced in scale 1 : 15.000.

Other maps included in the forest management plans are:

⇒ Soil maps (1 : 40.000)

⇒ Road maps (1 : 25.000)

⇒ Accessibility and mine hazard maps
(1 : 40.000)

⇒ Property map (1 : 40.000)

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Geographic Information Systems (GIS)

GIS are a set of tools that captures, stores, analyses, manages, and presents data linked to specific locations. In the simplest terms, a GIS is the merging of cartography, statistical analysis, and database technology. GIS is used in cartography, remote sensing, land surveying, public utility management, natural resource management, geography, urban planning, emergency management, navigation and more.

In our project we use GIS for:

- **Data collection** - geo-referencing old scanned paper maps, digitizing scanned paper maps, import forest data from the field, and retrieve information by interpreting ortophotos.
- **Data analysis** - selections, queries, statistics, replies to questions such as:
- **Data archive** - organising and maintaining the storage of all data collected (vector data, raster data, tables, etc.) including back-up routines;
- Data **distribution** - deliver and present reliable land resource data on time as maps, management plans, reports, tables and statistics. The data may be digital (files) or analogue (paper) depending on the needs of the user.
- **Operational forest management,** as GIS technology is an important component in operational forest management, and the forest management system developed in the project (FisKos).

A group of employees at Kosovo Forest Agency have attended theoretical courses regarding the fundamentals of GIS, *e.g.* datum, projections, coordinate systems and GPS, especially focusing how to use this technology for forestry purposes.

Software and suitable hardware for using this technology have by the project been provided to each region office of Kosovo Forest Agency, and forest managers from each of the offices have attended training courses.

Tools for reading this digital map information and using the new digital generation of forest management plans are also introduced to the Forestry Section at the Ministry of Agriculture, Forestry and Rural Development in Kosovo.

Forest management software and database

The project has developed a GIS based forest management system, for updating the forest information and maps, simplifying the use of the information in the day to day forest management, and to increase the access to the information from all levels of forest management in Kosovo. The system contains a database linked to the mapping system (GIS).

The system will be further improved in 2011 and during this year provided to all forest regions of Kosovo, and training in use of the system will be provided accordingly with the distribution.

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