

Country: **KYRGYZSTAN**

Project Title: **Capacity Building for National Forest and Tree Resource Assessment and Monitoring**

Project Number: **TCP/KYR/3102 (D)**

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Government Ministry responsible for project execution: **Ministry of Agriculture, Water and Processing Industry**

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(on behalf of Government)

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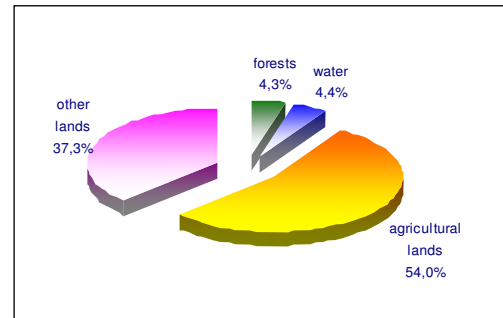
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(on behalf of the Food and Agriculture Organization of the United Nations - FAO)

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I. BACKGROUND AND JUSTIFICATION

Kyrgyzstan is a sovereign state located in the north-eastern part of Central Asia and surrounded by Tian-Shan mountains to the Northeast and Pamir-Altai to the Southwest. The territory of Kyrgyzstan is 199 940 square kilometres. 4.3 percent of it is covered by forests, 4.4 percent by inland water bodies, 54.0 percent used for agriculture and 37.3 percent as other uses. About 95 percent of the country consists of mountains reaching over 1 500 metres above sea level. The average height is 2 750 metres above sea level; the highest point is 7 439 metres and the lowest one is 401 metres.



58 percent of the population is settling within a 1000-2000 m height level. Around 5 percent of the population lives 2 000 m above sea level. Social security is a priority area in the Government policy. It was reported that more than half of state budget is spent for social programmes, which aim at poverty reduction, foundation of effective system of social security and sustainable economic growth. The population of Kyrgyzstan is in the region of 5.1 million people (49.4 percent are men and 50.6 percent are women). The urban population represents 35 percent and the rural population 65 percent of the total population. The density of the population is 25 people per km².

The official statistics indicate Kyrgyzstan has a modest forest cover (0.8 million ha or 4 percent of the land area and less than 0.2 ha per capita). Forests have long been recognized as playing a key environmental role in this mountainous country: they “act as accumulator of moisture; prevent mudflows, landslides and snow avalanches, regulate water discharge to rivers” and thus play an essential role for the “economy of Central Asia, where land cultivation is based on irrigation”. There are four major types of forests in Kyrgyzstan: walnut-fruit forests, spruce forests, junipers forests and flood-plain forests. There are also non-negligible gallery forests. In this connection, each type of forest should have its own model of management with the involvement of local people and communities in joint forest management.

Since independence from the Soviet Union in 1991, the loss of cheap wood and energy imports from the former Soviet Union has put high pressure on these limited forest resources to produce fuel wood mainly and some construction material. Kyrgyz forests also provide several non-timber forest products (e.g., walnut) that are both economically and culturally significant. Under the ongoing transition to market economy, forest resources are increasingly contributing to the livelihood of the poorest segments of the rural population in terms of household energy, fodder for the livestock, and revenues from collection of non-wood forest; as a result, forests are being degraded because of excessive harvesting of wood and uncontrolled grazing.

In the last decades, the territory of Kyrgyzstan has been placed under unprecedented threat by irrational and intensive use of natural resources. This has led to intensified degradation and deterioration of natural habitat of flora and fauna as well as significant reduction of biological species including species with important economic value and of local, national and global significance.

Justification of the assistance

The forestry sector of Kyrgyzstan is confronted with several problems. Due to the lack of timber

imports, overgrazing and population growth, the Kyrgyz forests are under pressure. The economic situation in the Kyrgyz forestry is unsatisfactory, especially the lack of financial resources and of engagement of the private sector. These problems are the driving force leading to a loss of precious forests, unique genetic resources and a dramatic worsening of environmental hazards such as mud flows, erosion and flooding.

Over the last decade and since access to full sovereignty, Kyrgyzstan has become active in forestry. A new policy for the forestry sector issued in 1999 expressed clear objectives for the long-term sustainable management of all types of forests. The objectives of the new policy can be summarized as follow:

- long-term sustainable management of forests must be guaranteed. The protection of forest biodiversity must have equal weight as the timber production. The forest area has to be increased by planting and by supporting natural regeneration;
- the administrative capacity of the forest farms (leskhozoes) is to be improved; decisions have to be transferred to a large extent to the level of the Leskhozoes;
- the local population has to be integrated in the forest policy development process and has to take over responsibilities for the protection and conservation of forests;
- private sector services should be utilized by forest enterprises in an optimum way;
- the role of state authorities has to be adjusted to the actual situation by the principle “not less but optimum interventions”.

These objectives have been stated in the forest law, which has been signed by the President of the Republic in July 1999 and is being implemented by the forest authorities. The authorities are aware that the forestry sector is still being treated in isolation from the surrounding land use systems where forests are elements that are influenced by, and influence, the policies guiding interventions in these land use systems in the country. The forestry policy does not mention the needed integration of the forestry activities in the rural development programmes.

The traditional approach of foresters who evolve within the forest boundaries without taking into account external influences on the resources needs to be changed. The foresters have to open to involvement of all partners, stakeholders and other land use institutions. There is strong need for a national dialogue for inter-sectoral policy harmonization in order to address effectively cross-cutting issues such as poverty, lack of food security, environment degradation, marketing, etc.

To combat the threats that Kyrgyz forests are exposed to, forest management planning has to be intensified and policy measures have to be taken. Both are dependent on coordination with other sectors and land uses and on sound information about the current situation of forest and trees resources outside forest. In the past, forest information was obtained by Lesprojekt – the public forest planning agency of the former Soviet Union. Information was obtained through subjective assessments of forests, but not representative sample surveys. Therefore, information on current values and changes of the resources is subject to uncertainty and of low reliability.

As stated in the letter of the Deputy Director of the State Agency of Environment Protection and Forestry of Kyrgyzstan, dated 30/3/2007, the National Action Plan for Forestry places the national forest inventory covering all forest types and land properties as a national priority. The Department of Forest and Hunting Management (DFHM) had already set up a forest inventory system. A national brigade of ten field crews is progressively surveying the forests falling under the responsibility of the State Forest Services (SFS). In 2005, about 60 percent of these forests had been covered by the inventory. The forests under other properties namely those falling under

the administrative office of the President and the locally managed forests are not yet inventoried when resources allow. There is no information on the real extent, potential and quality of these resources, and trees outside forests are not taken into account by the inventories. The shortcomings of the inventories carried out so far are the following:

- the relation forest/people is not studied while the forests are providing goods and services to local people that satisfy substantial part of their needs for their livelihoods. Moreover, local population exploits the resources in ways, reported as destructive of the forests and affecting their functions and vitality;
- the inventories focus on timber production and do not cover other products provided by, or that could be provided by, forests. The Kyrgyz forests provide local people with many products such as, fuel wood, medicinal plants, fodder, food and construction material. The importance of these products in people's daily life should be known if the sector's contribution in the national economy is to be properly determined;
- trees outside forests are not adequately covered by any inventory carried out so far despite their important role in the life of people and in reducing the stress on the forest itself;
- the monitoring of changes between forest land and other land uses is not part of the inventories carried out so far. All inventories have been carried out within the limits of the forest. The causes and extent of changes of forest limits to and from other land uses would give policy makers important additional information that would help addressing interactions between different land uses and lead to coordinated effort for policy harmonization among economic sectors;
- the inventories were carried out from a national perspective only and the information framework serves the purpose of national use. It would be useful to harmonize the information (classification systems, terms and definitions) with the international reporting requirements as Kyrgyzstan is requested to report regularly to the international processes and fora on a variety of land use issues;
- the ongoing programme of inventory will therefore not lead to national information on the nationwide extent and quality of the forest and tree resources.

The reasons of those shortcomings and limitations are mainly due to the limited capacity within the SFS and its awareness of the new developments in the area of forestry resources monitoring, assessment and information management and sharing at the international level. Kyrgyzstan became independent from the Soviet Union in the early 1990s and used to be very dependent on the Russian aides and models. Self-reliance is therefore still very limited. The new concepts of integration between sectors, harmonization of information frameworks in the country and with the international requirements, the broad scope of assessments including all social, economic and environmental functions and benefits of the forests and trees outside forest boundaries are very new to the Kyrgyz foresters. These concepts, appropriate statistical designs of forest inventory and new advanced system of information management have to be introduced to Kyrgyz foresters. On its own, the Government of Kyrgyzstan will not be able to introduce these approaches to its forestry sector.

The national system of forest and land-based information management is inadequate for the challenges facing the forestry sector and Kyrgyzstan's macro development aims. The DFHM has a small team experienced in conventional and narrow-scope inventories based on old technology,

and requires additional substantial capacity building and institutional strengthening to implement this project which encompasses broader scope of forest and trees benefits to meet all users' needs at national and international levels.

The main reasons for the inappropriate knowledge on the forestry resources include the lack of adequate approach for national resources assessment and information sharing. The existing vegetation maps are outdated and do not seem to meet the consensus of different land use institutions for common land use classification system and definitions as well as for harmonized nomenclature. This could be the cause of conflicts in land use managements.

Understanding the state of the resources, their trends and population needs will enable managing the resources in a more effective way to satisfy in a sustainable manner the local people's needs. Local populations should therefore be the target beneficiaries from lasting resources placed under sustainable management systems and integrated more into the other economic sectors in the country.

The outcomes of broad national forest assessment will enable planning for sustainable management of forests and trees and integration of these into the economic sectors. It will enhance the contribution for the improvement of the national food security through increase in productivity and food production on an economically, socially and environmentally sustainable basis. It will ultimately improve people's access to goods and services.

Development of knowledge on forest and tree resources, information management and dissemination requires extensive participation of stakeholders from different economic sectors. The project aims to guarantee a consensual basis on a number of issues related to land use management. A national consensus on harmonized national nomenclature, land use classification system, extent of information, information management and dialogue on inter-sectoral policy harmonization.

Assessment of the forest and tree resources will be carried out following most recent international standards that integrate forestry to other forms of land use systems. It will include all benefits (goods and services) from forests and trees and will in the long run allow establishing trends of the resources and the ways these resources are managed and used. The FAO approach developed to support countries plan and undertake national forest assessment will be followed to guarantee harmonization of results according to national and international requirements.

Owing to its wide experience in this area, FAO can provide the needed assistance to Kyrgyzstan through a well-designed programme of capacity building. This is among the reasons which led the Government of Kyrgyzstan to request FAO support for the formulation and implementation of a national forest inventory project. This project is designed by the Kyrgyz SFS with FAO assistance in response to that request.

Government priorities¹

The social security is a government priority area where the need for well-informed sectoral policies and poverty reduction strategy is very strong. The Government of Kyrgyzstan is engaged in a wide range policy dialogue with the aim of improving the wellbeing of the population through protection of the environment and maximization of the benefits from the natural resources that must be sustainably managed. It is within this angle that the country is making

¹ For detailed information regarding Government initiative in forestry inventory, see Annex 5

efforts to deal with all its resources and to develop them to maximize their contribution to the national economy and to ensure their perennality.

As part of the economic development effort, the Government prepared a new forest policy (approved by President's Decree in 1998). It promotes conservation of forest areas and poverty alleviation. The State program "Les" (2001-2005, approved by Resolution No. 715/2001) is one of the basic documents of the forestry sector at national level. It sets conservation and reproduction of forest resources as one of the priorities to enhance the economical stability of the forestry sector.

The New Concept of Forestry Development of Kyrgyzstan was drafted and approved by Government Resolution in 2004 in view to address social, economical and ecological matters. The Concept is the basic document determining a strategy for forest sector development and contains integrated strategic directions, including measures on poverty alleviation and provision of sustainable development. It is implemented in full line with the National Human Sustainable Development Programme.

The ongoing efforts of forest inventory and the results of this project is to generate the required knowledge on the social, economic and environmental benefits the forest and trees can provide to support the elaboration of the national poverty reduction strategy paper (NPRSP), update the policy framework and draw development strategies for the forestry sector.

As the project is planned to help set up a long-term monitoring, the Government immediate and long term objectives are to (1) strengthen its institution to be able to update the forestry information on the basis of internationally acceptable standards and; (2) to feed into the process of decision making (e.g. policies, poverty reduction strategy, national forest programme and forestry legislation) with the required quality information. The national debate on the national forestry programme and other policy issues was constrained by the lack of adequate knowledge about the forestry resources. The national forest assessment will greatly facilitate the national debate on forestry issues among stakeholders and will help establish consensus around them and avoid speculation and divergences among actors.

The project is therefore planned to assist the Government to put in place a system of forestry information operational with adequately trained personnel. The Government is planning to strengthen the Unit of forest inventory already in place within the DFHM to enable it to assume the responsibility for updating the future national forest assessment and monitoring of the forestry resources. The Unit is already institutionalized. The project will build on the experience of this Unit and its existing infrastructure. It is therefore through this strengthened Unit the project results will be sustainable in the long run.

Relation between the project and the Special Programme for Food Security

The project has a direct relation with the Special Programme for Food Security (SPFS) as it addresses the entire scope of benefits whether those are goods or services on which people largely depend for their daily livelihood. It has also a relation with the National Programme for Food Security being supported presently by the European Commission. It has further a relation with the Central Asian Mountains Programme (CAMP), the central interest of which is to improve the life quality of people in the rural and mountainous areas, and for which Switzerland is presently providing support. The Project will help assess the potential of resources and will contribute to diversifying revenue to local people and to the national economy.

Target beneficiaries

The project personnel (engineers, technical and fieldworkers) in the State Forest Services (SFS) and other sister institutions involved in implementation of the project will be the direct beneficiaries. Indirectly, the entire forest sector, including a wide range of institutions composing the forestry administration, the Government and the wood-processing industry will benefit through the availability of more accurate information for planning and policy-making. As such, the project targets the population of Kyrgyzstan especially in the mountainous areas where most of the forests are found.

Direct beneficiaries reached by the project will be the users of forest information in the forestry and related sectors, including local populations, Forestry Farm Enterprise in the oblasts and rayons levels and also international partners. At national level, this will be a generalized institutional benefit. The National Forest Authority (NFA) will yield results for immediate use to planners and developers. Forestry development programmes impact particularly on rural inhabitants and improve livelihoods for families, especially for women and youth.

Strategy

Within the framework of the country policy, strategies, priorities and principles for sustainable socio-economic development, synergies will be established between stakeholders through inter-institution and inter-sectoral partnerships and continued collaboration.

Building on the consensus to be established on the approach to NFA and the synergy created between the stakeholders, the project will carry out a comprehensive assessment of the resources particularly in relation to management, uses and users of the resources in the entire country. The assessment will cover a wide range of biophysical and socio-economic variables with emphasis on management, uses and users of the resources. For the purpose of resources assessment and monitoring, a national classification system will be developed with the related definitions. The classification will build on land cover/land use classifications existing in the country and at the same time be harmonized with global classifications.

The project will build on experiences developed in other countries where FAO supports NFA. A system of information dissemination to all users will be put in place. The project is a pre-investment set of activities, which are aimed at stimulating increased investment, by the Government itself or with the support of external funding institutions, in forestry and rural development. The project will be co-financed by the Government (US\$229 204), the Swiss-Kyrgyz Forestry Support Programme (US\$227 320) and the Technical Cooperation Programme (TCP) of FAO (US\$315 000). For the implementation of the project activities, FAO provides support to specific activities such as setting up an information system, procurement of specialized equipment for forest inventory, training of the national personnel, mapping and technical assistance for the introduction of appropriate technology, supervision and guidance of the project. The Kyrgyz Government and the Swiss-Kyrgyz Forestry Support Programme will cover the operational costs of the project (incremental cost of the fieldwork (salaries and allowances to personnel), hiring vehicles for the fieldwork, fuel and maintenance of the vehicles).

II. OBJECTIVES OF THE PROJECT

The overall objective of the project is to contribute to: i) the national efforts for the conservation and promotion of sustainable use of the forest and tree resources that enable to fulfil their environmental, social and economic functions; and ii) translating international processes and

principles into innovative national level policies and programmes and into field level practices in participatory planning and implementation. This will contribute to sustainable management of natural forests, planted forests, woodlands and agroforestry in a landscape approach for sustainable livelihoods. The project aims at:

1. Establishing broad consensus at national level on the needs for an approach to NFA that meets the needs of information for national use and for reporting to international processes e.g. biodiversity, carbon stock and information in connection MDGs.
2. Strengthening the State Forest Service, its depending department and related institutions and organizations for collecting information on forests and trees to contribute towards sustainable forest management. The capacity within the DFHM will be reinforced. Arrangements for continued collaboration between stakeholders will be defined.
3. Planning and undertaking national assessment of forests, including land use mapping, to create an information database according to national and international requirements and to set up long-term monitoring system. The assessment will cover wide range of biophysical and socio-economic variables of the resources with emphasis on management, use and users. For the purpose of resources assessment and monitoring, a national classification system will be developed with the related definitions. The classification will be built on the national classification systems and harmonized with the global classifications.
4. Building on the project findings, reviewing and updating policies and strategies to broaden their scope in order to address cross-cutting environmental, economic and social issues. Food security, poverty reduction in the rural areas, role of forests and trees in climate change mitigation will be among the elements of policy dialogue between national institutions.

III. EXPECTED OUTPUTS AND RESULTS

In support of Objective (1):

- 1.1 Participation of major stakeholders (civil society, NGOs, forest services, scientists, line ministries and international partners) concerned with forest and tree resources management ensured to pilot the project (one national seminar organised and Steering committee constituted and operational).
- 1.2 A national consensus on approach to NFA and long-term monitoring established (a working document on NFA approach and method drafted and discussed during a national workshop).
- 1.3 A national consensus on national list of forest and tree attributes from NFA established (a working document drafted and discussed during a national workshop).

In support of Objective (2):

- 2.1 SFS enabled to conduct national forest inventories and assessments including monitoring, presentation of findings and management of information.
- 2.2 Equipment procured and installed.
- 2.3 National expertise for NFA reinforced and consolidated (40 to 50 national staff trained).

In support of Objective (3):

- 3.1 Forest vegetation and land use classification system developed and harmonized.
- 3.2 Satellite image interpretation carried out and national forest/land use map constructed.
- 3.3 Field survey for data collection planned and carried out.
- 3.4 Forestry information system designed and put in place integrating field data georeferenced according to the data collection model and the geographical location of variables.

In support of Objective (4):

- 4.1 Diagnosis prepared on the state of the forest and tree resources, environment, and the ways these are managed and used by all parties.
- 4.2 Sector priorities defined, policy impact analysis carried out and policy dialogue for intersectoral harmonization undertaken.

IV. PROJECT ACTIVITIES**For Output 1.1: Participation of major stakeholders of NFA data reinforced**

- 1.1.1 Identify partners to co-sponsor and/or implement some project activities.
- 1.1.2 Set up a Steering Committee (SC) to oversee and provide guidance to the project team. The SC's main duty will be to monitor planning and implementation of the project activities, and help overtake constraints namely those in connection with inputs from all concerned parties and deployment of resources. The SC would be composed of representatives from the stakeholders and partners and will meet every three months under the chairpersonship of the Head of the Chairperson of the State Forest Service.
- 1.1.3 Convene one-day national seminar to inform decision makers in the forestry sector, related economic sectors and national and international partners about the scope of the project, the approach to be followed and timeframe of the project and exchange on ways of implementation to meet all users needs.

For Output 1.2: National consensus on approach and method to NFA and long-term monitoring.

- 1.2.1 Through discussions between national professionals and scientists, adapt the NFA approach proposed by FAO to national context in order to meet the national needs. The approach must be cost effective and developed to support national policy processes on forestry resources covering all forest types, other wooded lands and other lands with trees.
- 1.2.2 Convene a national workshop involving professionals from the sector and scientists to review and finalise the approach.

For Output 1.3.: National consensus on national list of forest and tree attributes from NFA established

- 1.3.1 Carry out a comprehensive review of needs of information on forest and trees and prepare a list of biophysical and socio-economic variables of the resources that extend to forests and trees, biodiversity taking into account the necessity to harmonize national database with global information requirements.
- 1.3.2 Convene national workshop involving representatives of partners and stakeholders to review and finalize the harmonized national list of variables.

For Output 2.1: SFS strengthened to be able to conduct national forest inventories and assessments including monitoring, presentation of findings and management of information.

- 2.1.1 Assess national experiences in the area of forest and tree resources assessment and information management and make use of it if judged useful to the NFA project.
- 2.1.2 Define the needs of personnel for office and fieldwork.
- 2.1.3 Define needs for training and capacity building for forest mapping, design and planning of national forest assessment, implementation of national projects and information management.
- 2.1.4 Define needs of equipment for the national forest assessment unit. The equipment will cover the field and office.

For Output 2.2: Equipment procured and installed

- 2.2.1 Specify and procure the needed equipment for planning and implementation of field survey, data entry, storage and processing. This includes satellite images covering the entire country, forest inventory equipment and database development and installation.

For Output 2.3: National expertise for NFA consolidated

- 2.3.1 Plan and carry out training of the national team in mapping using remote sensing techniques focussing on harmonization of classification system for long-term monitoring in the country and on facilitating country reporting to international processes.
- 2.3.2 Plan and carry out training of the national team in national forest assessment design and planning, information needs identification and fieldwork implementation.
- 2.3.3 Plan and carry out training of the national team in the area of data processing and analysis, information management and dissemination.
- 2.3.4 Organize a study tour to a team of two professional foresters from the DFHM in a country where similar and successful projects are taking place.

For Output 3.1: Vegetation and land use classification system developed and harmonized taking account of requirements for policy development, sustainable forest management and long-term monitoring and, forest/land use map prepared

- 3.1.1 Assist in the preparation of harmonized classification system of the forestry vegetation and land uses. The classification will take into consideration classification systems existing in the countries and those at international level such as the one used by FAO for global FRA.
- 3.1.2 Ensure wide dissemination and review of the developed classification system by professionals, scientists and SC members.
- 3.1.3 Finalize the national classification system on the basis of received comments and inputs from reviewers.
- 3.1.4 Support in design and preparation of national forest/land use map based on a harmonized legend with existing vegetation classifications in the country and with global classifications such as the one used by FAO for the global FRA, Land Cover Classification System (LCCS), etc.

For Output 3.2: Satellite image interpretation carried out and national forest/land use map constructed

- 3.2.1 Specify and procure a set of satellite images covering the whole country.
- 3.2.2 Support in the design and preparation of a forest/land use map based on the harmonized legend.

For Output 3.3: Field survey for data collection planned and carried out.

- 3.3.1 Prepare a manual to field crews describing the approach and techniques of data collection and materialization of permanent sample sites in the field.
- 3.3.2 Plan and carry out representative field sampling in all forest types, other wooded lands and other lands throughout the country to collect data as defined in the national list of variables.
- 3.3.3 Set up the monitoring system including registering the permanently established sample sites for periodic data collection on state and changes of resources.

For Output 3.4: Forestry information system designed, developed and put in place integrating geo-referenced field data.

- 3.4.1. Construct a functional database on forest compatible with other databases in the country. The database will contain spatial coordinates, so it can be linked to any Geographic Information System (GIS).
- 3.4.2. Develop a manual for data processing and analysis emphasizing on harmonizing project results in the country and with international information requirements.
- 3.4.3. Carry out entry and processing of the field data and issue project results.
- 3.4.4. Convene national workshop for professionals from the forestry sector, scientists, partners and stakeholders to validate the project results.
- 3.4.5. Define and put in place a system to disseminate information to all users using all possible media.

Output 4.1: Diagnosis prepared on the state of the forest and tree resources, environment, and the ways these are managed and used by all parties

- 4.1.1. Based on the findings of the project and using the capacity built within the DFHM, undertake a SWOT (strengths, weaknesses, opportunities and threats) analysis of the forestry sector in relation with other economic sectors, the state of the resources and their role in poverty alleviation, food security and socio-economic development.
- 4.1.2 Prepare recommendations to adapt policies, strategies, and programmes in connection with the forestry sector, environment and family sector in the rural areas.

Output 4.2: Sector priorities defined, policy impact analysis carried out and policy dialogue for inter-sectoral harmonization undertaken

- 4.2.1 Using project findings, identify priorities of the forestry sector for:
 - sustainable resources management;
 - environment protection;
 - effective participation of the local populations in resources management and conservation;
 - improved contribution of the forestry sector in the national economy.
- 4.2.2 Undertake a consultation among professionals from the forestry sector and other partners to validate the SWOT analysis and the defined priorities of the sector.

- 4.2.3 In view of the defined priorities, develop a coherent long-term action plan for sustainable forest management taking into account the social, economic and environmental dimensions of the sector.
- 4.2.4 In view of the defined priorities, engage inter-sectoral dialogue for policy harmonization and common vision on cross-cutting issues e.g. poverty, lack of food security, environment degradation, etc. and national reporting to international process (FAO/FRA, UNFCCC, UNCBD, UNCCD, etc.) on various aspects.
- 4.2.5 Convene a national workshop involving professionals from the forestry sector, scientists and representatives of partners and stakeholders to review and discuss the priorities and results of policy analysis and dialogue among concerned parties.

V. WORK PLAN AND IMPLEMENTATION ARRANGEMENTS

The project will last 24 months and the lead national institution will be the State Forest Service. It will be implemented in three phases (see Annex 3).

Phase I: Preparation, Training and Mapping

This phase includes all the preliminary arrangements and preparatory work for the project: i) training of the national inventory supervisors and field crews; ii) adjustment of NFA methodology, classification system and list of variables; iii) acquisition of equipment and satellite images and; iv) recruitment of national and international personnel.

The project is a major capacity building exercise. The national team in the DFHM will be familiarized with the techniques and methods of NFA, the forest and land use classification systems, and identification of forest, tree and land use attributes. The NFA approach of FAO will be the basis for national discussions. The sampling design and data collection model in the approach will be reviewed and adjusted when necessary. Without changing the configuration of tracts and the size, shape and spatial arrangements of the sample plots, the sampling may be adapted to the national context and to the specificity of the forest and tree ecosystems in the country in stratification and sampling intensity. The sampling intensity and the stratification defined by the Kyrgyz-Swiss cooperation programme could be borrowed by the NFA project and adapted to meet the basic requirements of the approach in information, timeliness and cost. The harmonized land use classification proposed by FAO will be analysed and improved in view of national and international information requirements. The forest type/land use map will be produced based on that harmonized classification. The list of biophysical, management and use variables will be thoroughly analysed and adjusted to include all parameters of national interest and to address the environmental, social and economic functions of the forests, trees and land use. The training will focus on the topics indicated in the following table:

Topics	No of hand-outs
<ul style="list-style-type: none"> • Information needs analysis • Forest policy and planning needs • General approach to forest assessment and monitoring • Sampling design • Mapping • Land use/forest types classification • Techniques of field data collection, including forest • Remote sensing • Field navigation (GPS use) • Database design and development • Data processing and analysis • Information management • Reporting and results dissemination 	40 – 50 engineers and technicians

As part of training, two officers from the DFHM associated with the project will participate in a study tour to a country where a successful national forest assessment is underway. Among these countries, the following may be considered: Honduras, Bangladesh, Zambia and Congo. The DFHM will secure deployment of the necessary technical staff to implement the office and field activities of the project. The training will be assured through workshops, courses and one study tour.

Mapping

Mapping is to be done within the DFHM and by the personnel of the Department. A national consultant will be contracted to (i) define the specifications of the satellite images and help procure them; (ii) participate in defining the harmonized land use classification; (iii) plan and organize satellite image interpretation including its field checking and validation; (iv) supervise the entire image interpretation activities including finalization and production of maps in digital format and hard copy. Images will be available directly through the contracted company (and specified in the LoA) or/and procured from alternative image providers according to the project team requirements. The GIS-Service Ltd holds a recent set of Advanced Spaceborn Thermal Emission and Reflection Radiometer (ASTER) images covering about 73 percent of Kyrgyzstan with gaps in areas that can be filled by Landsat TM images or other adequate imagery. 80 (74 x 74 km) Aster scenes out of total of 110 scenes are available with the GIS-Service Ltd. All were taken between 2002 and 2004. If these available images will be considered by the project team acceptable for the planned mapping, there will be no need to procure a new set, except those to fill the gaps. Landsat TM or other satellite scenes will be procured for the purpose and the project will bear the cost of their procurement.

Phase II: Field Survey

This phase includes materialization of the permanent sample sites in their field location, data collection from measurements of forest attributes, observations of forest and site attributes, and interviews with local people and target groups as well as data entry and storage.

In this project, fieldwork is a crucial activity. The planned outputs will depend largely on it. Permanent sample plots will be established for long-term monitoring of the forest and tree resources all over the country and in all land use classes. GPS is a key instrument in locating

plots with the help of latitude and longitude coordinates defined in advance on the topographic maps. The starting point of each plot will be marked with a metal pole driven in the ground. Reference points around the starting points of the plot will be identified, for which distance to and compass reading from the starting point of the plot will be taken and recorded to facilitate relocating plots in future surveys. Photographs will be taken as support documents for future plot location.

Measurements of forest and tree characteristics will be done in all land use classes (forest and non-forest lands). Observations of vegetation structure, health and spatial arrangements, and human activities will be recorded. Variables will be defined for this purpose at a workshop during the first phase of the project. Interviews with key informants from the local population, NGOs and entrepreneurs, etc. will be conducted in every sample site to identify major users of the resources (men, women, children and other groups), the products and services provided by the forest and trees, the way these are managed and used and for what end use.

Field crews will be trained properly and supervised to carry out the data collection. They will be prepared for future surveys and to maintain the established network of permanent sample plots. The national assessment team from the DFHM will also be trained in organization and supervision of the fieldwork.

On-the-job training will be continuous throughout the project implementation from planning the assessment to mapping, field survey, database development, data processing and analysis, and information management.

Phase III: Data Processing, Policy Analysis and Reporting

The third phase includes development of the database storing cartographic and field data, training of the national staff in charge of the system, data entry, processing and analysis, reporting of project findings.

The project will produce a considerable amount of data at national level. A functional information system will be designed, developed and established to structure and manage the collected inventory data, store it and process it to generate the needed information and expected outputs.

The base for the information system will be a structured database, which will include various levels of internal relations. The system will permit storage of data from sequential surveys in order to detect and estimate changes and establish trends.

The field data will be progressively entered in the database and georeferenced for integration and spatial representation of findings. Compatibility with other existing information systems and integration of existing datasets will be ensured.

A national workshop will be organized to review the project findings and provide recommendations on follow-up actions including formulation of the national forestry action plan, review and adjustment of sectoral policy, identification of specific inventories as well as other conservation and development activities, etc.

This phase will include a review and updating of policies and strategies to broaden their scope in order to address cross-cutting issues in relation with environmental, economic and social aspects e.g. food security, poverty reduction in the rural areas, role of forests and trees in climate change mitigation, etc. These issues will be the driving elements in the policy dialogue among national institutions.

VI. INPUTS TO BE PROVIDED BY FAO

The Regional Office for the Near East (RNE) will be operationally responsible for the project and the Forest Resources Development Service (FOMR) will, through the Support to National Forest Resources Assessment Programme, be responsible for coordinating the technical inputs, with other technical units as required such as the Forest Conservation Service (FORC), the Forest Policy and Institutions Service (FONP) as well as with the Gender, Equity and Rural Employment Division (ESWD) on gender issues. The national counterpart in Bishkek will be the State Forest Service under the Ministry of Agriculture, Water and Processing Industry.

The project will provide:

Personnel Services (TORs in Annex 2)

<u>Activities supported</u>	Expert/consultants	months
Training and supervision	<u>TCDC (Technical Cooperation among Developing Countries) Consultants</u> TCDC-1 Training in forest assessment and database management Expert (2 missions)	9 months
NFA: Planning and supervision	<u>National Consultants</u> NC-1 Forest Assessment	11 months
Mapping: Planning and supervision	NC-2 Remote Sensing (Forestry)	8 months
Data processing and analysis	NC-3 Biometrician and Data Processing	4 months
Policy analysis	NC-4 Forest Planning and Policy Analyst	4 months

FAO technical Supervisory services

<u>Activities supported</u>	Expert/consultants	months
Overall supervision and training	NFA Experts (FOMR)	6 weeks in 4 missions
Supervision	SEC/RNEO Experts	4 weeks in 2 missions

Casual Labour - Temporary Assistance

Provision is made for translators and interpreters Russian – English – Russian.

Materials, Supplies and Equipment

- procurement of specialized forest assessment equipment for US\$30 000. This will include the equipment and supplies shown in the list in Annex 1;
- procurement of office equipment and supplies for US\$20 500 to create a national functional database which will host the field data as well as the map produced by the project;
- procurement of satellite images and supplies for US\$9 800.

Training

It includes in-country trainings and one study tour, as follows:

- one-day national seminar to inform decision makers in the forestry sector, related economic sectors and national and international partners about the scope of the project, the approach to

be followed and timeframe of the project and exchange on ways of implementation to meet all users needs. At least 50 participants expected (US\$2 500; US\$50/person);

- workshop on approach to NFA applied to long-term monitoring of forest resources including harmonization of forest classification, terminology and definitions, statistical design of sampling, continuous forest inventory, permanent plots, data collection model, database and information management. At least 50 participants expected (US\$2 500; US\$50/person);
- workshop on forest and tree information needs and for the definition of the required set of biophysical and management/use variables to be covered by the NFA, options of each variable and definitions. (US\$2 500; US\$50/person) will be needed to cover costs for at least 50 scientists and professionals from the forestry and other economic sectors;
- workshop to validate project results and findings by professionals from the forestry sector, scientists, partners and stakeholders. At least 50 participants expected (US\$2 500; US\$50/person).
- workshop to review and discuss priorities and results of policy analysis and dialogue among concerned parties. At least 50 participants expected involving professionals from the forestry sector, scientists and representatives of partners and stakeholders (US\$2 500; US\$50/person);
- two-week theoretical and practical training courses in forest assessment to the national team from the DFHM and other land use institutions (US\$3 500);
- one-week introductory course to the field crew members focussing on the classification system, terms and definitions used, sampling design and field forms. This training will be assured by the national assessment team from the DFHM already trained on the subject with assistance from the international and national consultants (US\$3 500);
- two-week practical training course to the field crew members in forest assessment. This training will be assured by the national assessment team from the DFHM already trained on the subject with assistance from the international and national consultants (US\$3 500).
- in-service training of the field crews while carrying out data collection on forests and trees in selected representative sample sites in the country. Twenty eight technicians and professionals, composing fourteen field crews, will benefit from the extensive training in various aspects of data collection in the field (plot location and lay out, trees enumeration and measurements of their characteristics, interviews with target groups, setting up a system for long-term monitoring, etc). In order to cover all forest ecosystems and social aspects, a reliable set of data on forests and trees outside forest in different locations in the country will be collected and a long-term monitoring system to be put in place. The fieldwork will be implemented during the dry seasons of two successive years and related expenses covered by Government or donor funds. A provision of US\$15 000 will cover a part of initial training costs for field staff and data collectors;
- on-the-job training in land use and forest type mapping. The cost of this training will include theoretical and practical training of the personnel from the DFHM in methods of digital and analogue interpretation of remote sensing data (satellite images), development of key and manual for the interpretation work, methods of reconnaissance of the land use system and natural vegetation characteristics (support to operation cost transport and allowances), methods of checking of the interpretation results all over the country to correct/validate the

interpretation. The cost of these training components of at least ten engineers and technicians from the DFHM in a period of 12 months for the mapping is US\$20 000;

- a study tour for two forestry officers from the DFHM associated with the project to a country with an ongoing project of national forest and tree assessment and information management, e.g. Bangladesh, Kenya, Zambia or Congo (US\$ 6,000).

General Operating Expenses (GOE)

This budget provision will cover miscellaneous expenses required in the field for the operation of the project, such as telephone communications, photocopy paper, renting of transport vehicles, etc. as well as to process the terminal statement or concluding letter.

Direct Operating Costs (DOC)

This budget provision will to cover miscellaneous expenses at FAO headquarters related to the implementation of the project and the cost of operating the project.

VII. REPORTS

The National Project Coordinator (NPC) will provide FAO and the relevant technical services through the FAO National Correspondent in Kyrgyzstan a with a Quarterly Project Implementation Report summarizing the activities performed, the progress and outcomes of the project and a revised work plan for the next period as appropriate.

The international and all national consultants will present a technical report containing the main results, conclusions and recommendations at the end of each mission.

The NPC, under the supervision of the DFHM, will also prepare the draft terminal statement of the project according to TCP procedures. After finalization by the responsible Lead Technical Unit at FAO headquarters (FOMR), the terminal statement will be submitted to the Government of Kyrgyzstan.

The terminal report will include a technical synthesis of the various Consultants reports and summarize the main results and conclusions of the project. In addition, it will contain FAO's recommendations to the Government and set indicators for a follow-up impact assessment one year after the project NTE.

The FAO Lead Technical Unit (FOMR) in coordination with the Forestry Department Group (RNE) at the Regional Office for the Near East will be responsible for ensuring that the technical reports of consultants be submitted in a timely manner, technically sound and distributed them to other FAO participating units. At the end of every mission, FAO officers providing supervisory and advisory technical services will prepare a technical report with results, conclusions and recommendations and conduct briefings with other FAO staff as necessary.

VIII. GOVERNMENT CONTRIBUTION AND SUPPORTING ARRANGEMENTS

The achievement of the objectives set by the project will be the joint responsibility of the Government of Kyrgyzstan and FAO. The Government of Kyrgyzstan will contribute to the project for a total amount of US\$229 204 and the Kyrgyz-Swiss Forestry Support Programme for

a budget of US\$227 320. The Ministry of Agriculture, Water and Processing Industry will provide, through the State Forest Service:

- all physical facilities (offices for staff and database, training space, communication means, etc.);
- the needed national counterpart staff at secretariat and professional level;
- the national personnel for mapping, data collection in the field and data entry and processing;
- local transportation for the entire fieldwork;
- in-kind contribution to cover salaries of field crew members, personnel in charge of the database and part of fuel and maintenance of the project vehicles;
- national Project Coordinator (NPC);
- steering Committee (SC) whose responsibility will be to oversee the project implementation, facilitate inputs to the project in all phases, ensure wider dissemination of results and provide guidance to the State Forest Service on sustainability of the project outcomes at the long run.

The SFS will provide in-kind contribution to the project to cover salaries of field crew members, personnel in charge of the database, vehicles and part of their fuel and maintenance. The SFS will bear the running cost for the National Database.

The project will be based within the premises of the DFHM. The overall responsibility of the project implementation will be vested with the DFHM, under the supervision of the SFS. The DFHM will be assisted by the TCDC expert in forest inventory/assessment and capacity building and locally recruited consultants and interpreter. The DFHM will have the overall coordinating role, including the training of the national personnel, the design and planning of the forest assessment project. The DFHM will act to reinforce its structure and develop its capacity to forestry resources inventory and assessment and information management at national level.

The SFS will appoint a National Project Coordinator (NPC) and will also arrange for a quick clearance of experts, custom clearance of equipment, tax-free for local purchase of project equipment and supplies. The NPC will:

- i) coordinate interventions of the national institutions and individuals involved in the project;
- ii) facilitate the training of the national team and field crew members;
- iii) oversee fieldwork activities and secure timely deployment of the logistical support to the field crews;
- iv) participate in the design and development of the National Database, processing the field data and reporting of project findings;
- v) prepare a progress report every three months to SFS and to FAO.

Under the supervision of the Director of the DFHM, the NPC will work with the international experts and national consultants to supervise the project activities, organize forest mapping and fieldwork making use of the staff assigned to the project by the DFHM. The DFHM will be the responsible national institution for the project implementation and will have the overall role for the supervision of the project progress, including biophysical measurements/observations/interviews at the selected sites for the assessment. The DFHM will also take responsibility for taking all measures to sustain the established national database.

The SFS will set up for the project a Steering Committee (SC) whose responsibility will be to oversee the project design and implementation, facilitate inputs to the project in all phases, ensure wider dissemination of results and provide guidance to the DFHM as how it will ensure sustainability of the project outcomes at the long run. The SC will be composed of representatives from DFHM as the principal actor and implementing agency, the SFS, representatives from forest-related sectors, partners and stakeholders. The SFS will ensure wide

representation of all concerned parties in the SC.

Satellite imagery will be required for the preparation of the forest/land use map. The whole coverage of the country will be procured by the project. The consultant in remote sensing from the GIS-Service Ltd will prepare the specifications of the whole set of images and procure the needed number of scenes. The project will cover expenses incurred for image procurement, forest mapping in connection with international experts, national consultants and procurement of material and supplies and fieldwork for reconnaissance and interpretation checking. The TCP consultants will supervise the map design and timely production of the forest type/land use map.

The FAO Lead Technical Division will assist the NPC in planning the overall project activities, training the national assessment team in all areas of forest assessment, design and planning, conducting field surveys, mapping and data processing. It will help defining the needs of national personnel associated with the project and assure their deployment according to the work plan.

The SFS through this request, which aims to put in place a long-term monitoring system of the resources, is committed to follow up the activities and carry out periodic data collection from the network of permanent sample plots materialized in the field and whose register is catalogued in the DFHM, maintaining the trained team operational and the forest and tree information system updated.

Project Budget**(in US\$)**

Project Title: **Capacity Building for National Forest and Tree Resource Assessment and Monitoring**

Project Number: **TCP/KYR/3102 (D)**

TCP/KYR/3102 (D)			
Capacity Building for National Forest and Trees Resources Assessment and Monitoring			
Comp.	Component Description	Sub Comps.	Main Comp.
5013	Consultants		59 400
5543	Consultants – National	21 600	
5544	Consultants - TCDC/TCCT	37 800	
5020	Overtime		7 700
5652	Casual Labour - Temporary Assistance	7 700	
5021	Travel		64 940
5686	Consultants - TCDC/TCCT	39 340	
5694	Travel – Training	6 000	
5692	Travel TSS	19 600	
5023	Training		58 000
5920	Training Budget	58 000	
5024	Expendable Equipment		23 300
6000	Expendable Equipment	23 300	
5025	Non Expendable Equipment		37 000
6100	Non Expendable Equipment Budget	37 000	
5027	Technical Support Services		31 420
6111	Report Costs	1 950	
6120	Honorarium TSS	29 470	
5028	General Operating Expenses		15 436
6300	General Operating Expenses Budget	15 436	
5029	Support Cost		20 804
6118	Direct Operating Costs	20 804	
	Grand Total		318 000

Indicative budget in support to the project from other donors

Items	Contributions (US\$)	
	SFS	Swiss Programme/or other donor
* Desktop computer	1 000	1 000
* Various supplies and consumables	2 000	3 000
*Forest Inventory Equipment		10 000
* In-service training during 14 months fieldwork of provincial	20 384	
*Workshops		7 500
Recurrent Costs		
* Salaries		
- National Project Coordinator	12 000	12 000
- Senior technicians (engineers)	49 000	49 000
- Junior technicians	34 300	34 300
- Field workers	28 000	28 000
* Transport		
- Vehicles operation (8 months)	39 200	39 200
- Vehicles operation (18 months)	3 000	3 000
-Vehicle hire	40 320	40 320
Total Project	229 204	227 320

List of equipment and supply for NFA in Kyrgyzstan

Items	Units	Quantity
1. Equipment and Supplies, National Database		
* Workstation: (160 GB Hard disk with big storage capacity, extra hard disk for back-up with equal capacity, 21" large monitor and Combo CD/DVD writer)	Unit	1
* Desktop computer	Unit	1
* Printers	Unit	1
* GIS and Database software	Lump sum	1
* Colour Plotter A0 format	Unit	1
* Various supplies and consumables	Lump sum	1
2. Forest Inventory Equipment		
* Dendrometers	Unit	15
* Callipers or diameter tapes	Unit	15
* Measuring tapes 30-50 m	Unit	15
* Measuring tapes 10-20 m	Unit	15
* Altimeters	Unit	15
* Compasses	Unit	15
* Waterproof back-bags	Unit	16
* GPS	Unit	15
* Digital Cameras	Unit	15
* Range Finders with amplification	Unit	14
* Finn-calliper 30 cm, 40 cm, 60 cm	Unit	16
* Telescope pole for the finn-calliper 7 m.	Unit	16
* Coloured flagging	Rolls	112
* Emergency kit	Unit	16
* Waterproof outfits	Unit	112
* Boots	Unit	70
* Galvanised steel bars	Unit	600
* Cellular phones and pre-paid cards	Unit	16
* Increment borer Pressler	Unit	16
* Machetes	Unit	20
* Writing tablets	Unit	16
* Flipchart	Unit	15
* Camping equipment and cooking utensils	Set	16
* Topographic maps	set	4
* Field manuals, forms, stationery, tree species list/flora, etc.	set	14
* 4x4 Vehicles (Government's contribution)	Unit	16
3. Mapping		
* Landsat TM scenes	Unit	6
* ASTER scenes	Unit	80

Terms of Reference for Consultants

Capacity Building in Forest Assessment Consultant (TCDC-1)

Under the overall supervision of Chief, Operations Branch, Regional Office for the Near East (RNER), the direct and technical supervision of the Forest Resources Development Service (FOMR) and the Forestry Group, Regional Office for the Near East (RNEO)/Subregional Office for Central Asia (SEC), and in collaboration with the national authorities and with national consultants and personnel, the consultant will provide the technical assistance and support to the Department of Forest and Hunting Management (DFHM) for the training of national personnel, planning and implementing the project activities. The main tasks of the Consultant will be to:

- work with the national team from the DFHM and related land use institutions to review and adjust when necessary the inventory methodology, land use classification and biophysical and socio-economic variables;
- oversee the interpretation of satellite images using the harmonized land use classification and production of the map;
- prepare, in collaboration with the national consultants and National Forest Authority (NFA) Experts, a training programme for the national personnel involved in the project and assists the DFHM in implementing it;
- participate in implementing the training programme to the national personnel including the team of supervisors, the field crews and database personnel through the planned workshops and courses;
- assist the DFHM in purchasing, installing and using the equipment and supplies planned for the project;
- work with the national personnel and the national consultant to reinforce the DFHM in strengthening the specialised Unit for resources monitoring and information management;
- in close collaboration with the national consultants, prepare a plan of the project activities and identify timely inputs from the project and the Government;
- provide supervision to the field crews during the survey and provide technical guidance to homogenize data collection and best interpretation of variables and definitions. Frequent visits to all crews must be carried out throughout the assignment of the expert;
- work closely with the national information system consultant to develop and set up a database, enter, validate and store the field data, prepare functions for data processing and initiate data processing;
- assist in data analysis, reporting of findings and elaboration of the project terminal statement.

Duration: nine months.

Duty Station: Bishkek with frequent field trips.

Qualifications: the Consultant should have a strong background in remote sensing, forest inventory design and planning. The consultant must be competent in forest information system development and information management and have confirmed experience in capacity building and project implementation.

Language: English required and Russian preferred.

Terms of Reference

National Forest Assessment Consultant (NC-1)

Under the overall supervision of Chief, Operations Branch, Regional Office for the Near East (RNER), the direct and technical supervision of the Forest Resources Development Service (FOMR) and the Forestry Group, Regional Office for the Near East (RNEO)/Subregional Office for Central Asia (SEC) and in collaboration with the national authorities, other national consultants and personnel and with the TCDC (Technical Cooperation among Developing Countries) expert, the NC will participate in the training of the project personnel, supervise project activities during his/her interventions. He/she will supervise the field teams, provide technical guidance to harmonize data collection and necessary logistical support, make preliminary contacts with the local forest services, local administrative authorities, land owners and other target groups for interviews by crews and information on access, resources management, use and users. The main tasks of the Consultant will be to:

- prepare an inception report and submit to the Department of Forest and Hunting Management (DFHM) and FAO for comments;
- work closely with the National Project Coordinator (NPC) and the TCDC expert to prepare a work-plan for implementation of project activities following the participatory approach where professionals, scientists and stakeholders from the sectors involved must be represented;
- work closely with the national personnel and international consultants and provide inputs for the elaboration of training programme to be given to the national staff involved in the project and assist the DFHM in implementing it;
- participate in implementing the training programme to the national personnel including the team of supervisors, the field crews and database personnel through the planned workshops and courses;
- work with the TCDC consultant and with other national consultants to reinforce the DFHM in strengthening the specialized Unit for resources monitoring and information management;
- assist the DFHM in planning and servicing the workshops planned during the project and securing wide participation of different stakeholders from different sectors;
- work with professionals from other sectors and scientists and in close collaboration with the TCDC consultant to reach a consensus on the NFA approach and long-term monitoring;
- assist in coordinating efforts of the DFHM to define information needs and harmonize the forest/land use classification;
- assist the DFHM in purchasing, installing and using the equipment and supplies planned for the project;
- in close collaboration with the TCDC consultant, prepare a plan of project activities and identify timely inputs from the project and the Government;
- provide supervision of the field crews during the survey and technical guidance to homogenize data collection and interpretation of variables and definitions. Close supervision of all field crews will be provided during the start of the fieldwork;
- assist in organizing field crew outputs and in filing them;
- in close collaboration with the TCDC consultant, assist in developing the national forest and trees information system, entering and storing the field data, preparing functions for data processing and undertake data processing;

- assist in data analysis and reporting of findings;
- prepare the project progress report on the component of inventory and the terminal statement.

Duration: 11 months.

Duty Station: Bishkek, and frequent travel inside the country.

Qualification: the Consultant should have at least M.Sc. in natural resources management or equivalent with more than ten years' working experience and a background in forest resources assessment design, planning and competence in information system management and have experience in capacity building and project implementation.

Language: English required and Russian required.

Terms of Reference

National Mapping and Remote Sensing Consultant (NC-2)

Under the overall supervision of Chief, Operations Branch, Regional Office for the Near East (RNER), the direct and technical supervision of the Forest Resources Development Service (FOMR) and the Forestry Group, Regional Office for the Near East (RNEO)/Subregional Office for Central Asia (SEC) and in collaboration with the national authorities, other national consultants and personnel and with the TCDC (Technical Cooperation among Developing Countries) expert, the NC will participate in the training of the project personnel and supervise project activities in connection with forest/land mapping and remote sensing. He/she will participate in the development of methodology for mapping, supervise the interpretation of the satellite images, supervise field checking and validation of the interpretation, and will ensure that the interpretation team has the necessary logistical support. The main tasks of the Consultant will be to:

- prepare the inception report and submit it to the Department of Forest and Hunting Management (DFHM) and FAO for comments;
- examine the existing thematic maps on forestry and other land uses and assess their quality in terms of thematic details, dates of production, methods of production, and precision;
- participate in defining the harmonized land use classification which should be based on the FAO classification global Forest Resources assessment;
- define the specifications of the land use map to be produced and methodology to be applied;
- define the specifications of the remote sensing data needed and help their procurement. Use should be made of existing data and resort to purchase only if the existing data is judged not suitable or incomplete;
- plan and organize satellite image interpretation including field checking and validation;
- provide training to the national personnel in forest/land use mapping;
- oversee the entire image interpretation activities including field checking and finalization of the interpretation;
- validate the interpretation results, produce a final map based on the harmonized legend and generate statistical results on areas of the different land use units;
- in close collaboration with NFA Expert, the National Forest Assessment Consultant, and TCDC Consultant, prepare mapping storage system;
- work with the TCDC consultant and with other national consultants to reinforce the DFHM in strengthening the specialized Unit for resources monitoring and information management;
- prepare and submit final consultancy report describing the planned activities, the method followed for land use mapping, training programme and beneficiaries and results of the mapping work and the results achieved.

Duration: eight months.

Duty Station: Bishkek with frequent travel inside the country.

Qualifications: The consultant should have at least M.Sc. in forest mapping using remote sensing techniques. The consultant should have at least ten years of experience in mapping related activities. The consultant should be conversant with the knowledge of forest inventory, Geographic Information Systems (GIS), Mapping and Remote Sensing.

Language: English required and Russian preferred.

Terms of Reference

Biometrician and Data Processing Consultant (NC3)

Under the overall supervision of Chief, Operations Branch, Regional Office for the Near East (RNER), the direct and technical supervision of the Forest Resources Development Service (FOMR) and the Forestry Group, Regional Office for the Near East (RNEO)/Subregional Office for Central Asia (SEC) and in collaboration with the national authorities and with the TCDC (Technical Cooperation among Developing Countries) consultant, the national consultant will provide technical assistance and support to the Department of Forest and Hunting Management (DFHM) in the areas of capacity building, institutional strengthening and data processing and analysis. The main tasks of the consultant will be to:

- sort, process, analyse and validate the collected data. This work will be coordinated with the NC-1 and TCDC-1. The NC-3 will analyse the data in accordance with the agreed strategy for producing results and statistical calculations and store the findings in an easily retrievable format;
- refine the analysed data and compile the relevant sections of the report for submission to the Government and to FAO. This work will be done on the basis of the recommendations from the workshop on the project findings;
- ensure that the DFHM counterpart personnel fully understands all the work processes related to extracting, sorting, processing and analysing the collected data so that future repetitions will be possible with the DFHM's own capacity;
- develop a manual for data processing and analysis emphasizing on harmonizing project results in the country and with international information requirements.
- report any technical problems related to the data and the Information System/Database to the DFHM counterpart and to FAO;
- describe all the work performed in the form of a terminal report at the end of the recruitment period, to be submitted to and technically cleared by the FAO Lead Technical Unit of FAO headquarters. The report should contain: i) ample descriptions of the methods used to validate and process the field data to allow for accurate future repetitions of the work; and ii) recommendations for possible improvements of the database application including a description of any technical problems and any 'bugs' encountered during the work;
- assist in any other tasks under the project at the instruction of the NPC.

Duration: four months.

Duty station: Bishkek

Qualifications: the consultant should have a strong background in information system development, database management, statistical analysis, forest inventory, biometry and be familiar with MS Access database application at an advanced level.

Language: Fluency in English is required, Russian is preferred.

Terms of Reference

National Planning and Policy Analysis Consultant (NC-4)

Under the overall supervision of Chief, Regional Office for the Near East (RNER), the direct and technical supervision of the Forest Resources Development Service (FOMR) and the Forestry Group, Regional Office for the Near East (RNEO)/Subregional Office for Central Asia (SEC), and in collaboration with the national authorities and with the TCDC (Technical Cooperation among Developing Countries) consultant, the national consultant will provide technical assistance and support to the Department of Forest and Hunting Management (DFHM) in the areas of policy impact analysis involving wide range of institutions concerned and institutional strengthening. The main tasks of the consultant will be to:

- undertake the review of policies dealing with forestry, agriculture, livestock, rangeland, soil and water conservation, biodiversity, environment, etc;
- carry out an analysis of the forestry sector in terms strengths, weaknesses, opportunities and threats. Said analysis to be carried out based on project findings, and existing literature;
- prepare recommendations to improve the forestry policy and to engage inter-sectoral dialogue among national institutions to harmonise the policy framework;
- in close collaboration with the NPC, the NFA Expert, the NC-1, and TCDC consultant, convene a three-day workshop to present and discuss results of the review of the different land use management policies, the forestry policy analysis and the recommendations for harmonization among the economic sectors;
- prepare a report of the workshop that should define areas of harmonization between policies, and follow up actions to consolidate the national dialogue on policy harmonization;
- prepare and submit final consultancy report.

Duration: four months.

Duty station: Bishkek.

Qualifications: The consultant should have at least a M.Sc. degree in policy and planning with a minimum ten years' experience in activities related to policy and planning.

Language: English required and Russian preferred.

Terms of Reference

Translator/Interpreter English- Russian/Kyrgyz - English

Under the overall supervision of Chief, Regional Office for the Near East (RNER), the direct and technical supervision of the Forest Resources Development Service (FOMR) and the Forestry Group, Regional Office for the Near East (RNEO)/Subregional Office for Central Asia (SEC), and in collaboration with the national authorities and with the TCDC (Technical Cooperation among Developing Countries) consultant, the national consultant will assist the project team in interpretation and to translate project documents from Russian/Kyrgyz to English and from English to Russian. The main tasks of the consultant will be to:

- facilitate the communication between national consultants, project personal and international consultant/FAO backstopping officers;
- interpret in meetings and training sessions, both from English to Russian and Russian//Kyrgyz to English;
- translate the project documents and presentations, correspondence from and to FAO, Rome and the TCDC consultant, both from English to Russian and Russian/Kyrgyz to English. It includes field manual and field forms, consultant reports, database, final project reports, letters, emails and other official communications.

Duration: when actually employed (WAE).

Duty station: Bishkek.

Qualifications: the consultant should have at least a Master's degree in English language with a minimum five years' experience as a translator and interpreter Russian/Kyrgyz – English – Russian. He/She should have ability to understand and proven experience to translate technical documentation related to forestry and policy analysis.

Language: Excellent oral and writing skills in English, Russian and Kyrgyz.

Advisory Technical Services from FAO

Four missions for a total of six weeks from FOMR

Under the supervision and technical direction of the Forest Resources Development Service (FOMR) and in collaboration with the national authorities, the officers will support the project as foreseen in the work plan. The officers will also provide technical assistance and guidance to the National Project Coordinator and international/national consultants on aspects in connection with:

- putting in place the organization of the project at the national level;
- setting up the Steering Committee for the project and coordinating their work and inputs;
- integrated national forest and tree assessment methodology development including sampling design, classification system harmonization and variables;
- forest type and land use mapping;
- training of the national forestry personnel in the areas of national forest and tree assessment and information management;
- field survey for data collection on forest and tree resources;
- data processing, information system development and reporting with focus on forest and tree data;
- supervise and interact with international staff on the local training courses;
- overall technical supervision of project implementation and delivery at the national level;
- integration of forestry resources in policy analysis on the basis of the project findings;
- technical editing and clearance of project reports including the terminal statement.

Two missions for a total of four weeks from the Subregional Office for Central Asia (SEC)/Forestry Group, Regional Office for the Near East RNEO

Under the supervision and technical direction of FOMR and in collaboration with the national authorities, the backstopping officer, RNEO, will undertake two missions in support to the project as foreseen in the work plan. The backstopping officer will also provide technical assistance and guidance to the National Project Coordinator on aspects in connection with:

- reviewing and assisting in putting in place the organization of the project at the national and district levels;
- assisting in setting up a National Team (NT) for the project;
- launching the project;
- assisting in setting up a Steering Committee for the project;
- finalizing the work plan of the project identifying necessary inputs from the Government and the TCP (technical staff, equipment, transport, supervision);
- identifying and selecting national and international consultants. From the national consultant immediate action should be given to forest assessment and mapping;
- reviewing the list of technical staff for field activities and the training programme;
- attending final workshop on policy analysis and contribute to moderating inter-sectoral dialogue on policy harmonization;
- advising on dissemination to and use of information by all users.

Government efforts for national forest inventory

Since 1996, the State Forest Services (SFS) put in place a system for forest inventory and information management. The Department of Forest and Hunting Management (DFHM) has been assigned the mission to carry out the activities of forest inventory. At national level, the DFHM is composed of three units: (1) Forest Inventory Unit; (2) Planning Unit; and (3) Database and Data Processing Unit. The DFHM has created a national brigade composed by fourteen crews for field surveys.

The technical assistance provided under the Kyrgyz-Swiss cooperation programme on forests, helped in designing a methodology for national forest assessment. The methodology is characterised by the following main features:

- the forest is defined as vegetation composed of forest tree species with a minimum height of two metres and a minimum crown cover of 10 percent with the objective of timber production and/or protection function and/or other functions. These include open and closed natural forests, plantations (gardens, vineyards, parks, forest parks and industrial plantations), shrubs (minimum density of 67 percent and minimum height of 0.5 m) and line-shaped natural or planted forest trees (gallery, road sides, etc.);
- sampling design is a one-phase, based on systematic field survey only within the forest areas and with an allocation of plots following a dot grid of varying density inside the area of Kyrgyzstan with a potential of existence of tree belts. Clusters with concentric, fixed area circular plots are employed as sample units. Changes are estimated based on a sampling with partial replacement (SPR) layout of sample plots with continuous inventory (CFI) type estimators;
- in the forest areas, the national forest inventory of Kyrgyzstan is stratified in four areas according to the distribution of the main forest types of the country. The reason for the stratification is the very different area of the main forest types (spruce, walnut forest) and different precision requirements. The dot grid intervals for the different strata are given in the following table:

Strata	Main Forest Type	Distribution Area	Dot Grid Interval
1	Spruce forest	Provinces of Issyk-Kul (Karakol), Naryn and Chu (Bishkek)	2 x 2 km
2	Walnut forest	Centre and East of Dzhalal-Abad Province and North of Osh Province	1 x 1 km
3	Other broadleaf forest	Province of Talas & West of Djalal-Abad Province	2 x 2 km
4	Archa forest	South of Osh Province	4 x 4 km
5	Shrub forest	All Kyrgyzstan	4 x 4 km

- a cluster consists of three trial plots localized in form of a right-angled triangle with 100 metres' distance between the edges and the centre of the triangle. Sample plot 1 is identical with the dot grid point. Sample plot 2 lies ten meters east of plot 1. Sample plot 3 lies 100 metres north.

The approach is statistically sound and seems to be well adapted to different Kyrgyz forest ecosystems. However, it has a number of limitations compared with present complex requirements of information on a variety of forest and land use related issues. Among these:

- it treats the forest resources in isolation from the surrounding land use systems. Considerable loss of forest cover took place during the last sixty years. About 55 percent of forests were changed to other land uses since 1930. The loss is expected to continue with the social and economic development of the country. Any sampling design should produce information on – and monitor – the changes taking place between the different land uses;
- the objectives of the design are forest management and support to policy makers. This adds complexity to the National Forest Assessment (NFA) and increases the cost. The NFA objective should be defined to optimize the incurring cost. NFA as a nationwide exercise should focus on information for policy making. For forest management, separate designs can be developed for targeted areas of interest;
- the forest and tree products are not covered by the approach. Kyrgyz forests provide different products e.g. fuel wood, medicinal plants, fodder, food, construction material and many others. The importance of these products in people's livelihoods should be known if the sector's contribution in national economy is to be properly assessed;
- the approach uses terms and definitions that can be used only nationally. There is nothing wrong with this, but it is useful if the information (classification systems, terms and definitions) is harmonized with the international reporting requirements. Harmonized information facilitates the country reporting to the international processes.

The Kyrgyz SFS formulated and submitted in 2003 a project proposal to the Russian Federation for funding. The Russians did not react on it.

Recently, the Kyrgyz SFS developed a reasonable capacity for forest assessment. The DFHM is well manned and properly organized for forest inventory and assessment. Three units work together in planning and evaluation of forest inventory, field survey and data processing and analysis. Field inventory is, thus, the main activity of the DFHM during the last decade. About 60 percent of the forest under the SFS is already surveyed.

How to harmonize national information framework?

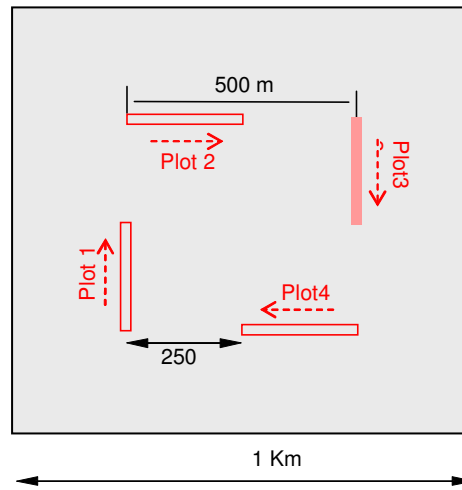
In collaboration with a team of international experts, the Forestry Department of FAO has recently designed an approach for national forest and tree resources assessment that helps to meet the needs of different users of information at the national and international levels. The main focus of the approach is:

- capacity building as a main requirement for sustainability of the NFA programme;
- assessment of the state, extent and quality of forests and trees resources for decision makers at national level;
- long-term monitoring of the resources and their uses and users.

The approach is based on:

- nationwide systematic sampling following a latitude/longitude grid of spacing defined for each country according specific sampling intensity. Each sample unit is a cluster of four plots of 0.5 hectare each. The plots are strips of 20 x 250 metres laid out within a tract of 1 x 1 km. The southwest corner of the tract coincides with the intersection of the lat/long grid. The starting point of first plot is located at 250 meters from the southern side and from the western side of the tract. The four plots start at the angles of a square of 500 meters side. They are placed a 250 meters from each other. The first plot is south/north, the second plot is west/east, the third plot is north/south and the forth plot is east/west. The size, shape and arrangement of the plots of the plots were chosen to explore the maximum micro and macro variability of the site, reduce the effects of natural trends, cross as many land use classes as

possible for the monitoring of changes in continuous inventories and to minimise the fieldwork and hence the cost.



- National implementation of NFA – national ownership.
- NFA developed and implemented following the participatory approach.
- Moderate cost for sustainability of the NFA programme. The sampling intensity is optimised to produce information with the required reliability for national decision making without overloading the NFA with unnecessary work.
- Optimum timeframe of the NFA project (maximum 24 months). Lengthy inventories tend to decrease the quality of the results.
- Harmonised information framework. The NFA creates baseline information acceptable to all users. To increase utility of the information, the latter should be harmonised with the existing information as well as with the international reporting requirements.