

CARBON SEQUESTRATION THROUGH CLIMATE INVESTMENT IN FORESTS AND RANGELANDS IN KYRGYZSTAN (CS-FOR)

Forestry Working Paper



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Acronyms and abbreviations

AD	Anno Domini
AKJ	Association of Pasture User Unions “Kyrgyz Jaiyty”
APIU	Agricultural Projects’ Implementation Unit under Ministry of Economy
ARIS	Community Development and Investment Agency
BAU	Business As Usual
°C	Celsius degree
CBD	Convention on Biological Diversity
CFM	Collaborative Forest Management
CLMG	Community Landscape Management Groups
CFS	Climate Financing Secretariat
CS-FOR	Carbon Sequestration through Climate Investment in Forests and Rangelands
CSR	Corporate Social Responsibility
DPLF	Department of Pastures, Livestock and Fisheries
FAO	Food and Agriculture Organization of the United Nations
FLEG	Forest Law Enforcement and Governance
FMU	Forest Management Unit
GCF	Green Climate Fund
GDP	Gross Domestic Product
GDS	Department of cadastre data and registration of rights to immovable property
GEF	Global Environmental Facility
GIS	Geographical Information System
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
ha	hectare
HCVF	High Conservation Value Forest
HLPE	High-level panel of experts
HWP	Harvested wood products
INRMCRP	Integrated Natural Resource Management and Community Resilience Plan
IPCC	Inter-Governmental Panel on Climate Change
JICA	Japan International Cooperation Agency
KBA	Key Biodiversity Area
KIRFOR	The Kyrgyz-Swiss Forestry Support Programme
KOICA	Korean International Cooperation Agency
KSRILP	The Kyrgyz Scientific-Research Institute of Livestock and Pasture
KSRVI	The Kyrgyz Scientific-Research Veterinary Institute
Kyrgyzgiprozem	State Design Institute for Land Management
LU	Livestock Unit
m	meter
MAFIM	Ministry of Agriculture, Food Industry and Melioration
MES	Ministry of Emergency Situations
MSAC	Multi-stakeholder Advisory Committee
NAP	National Adaptation Plans
NDA	National Designated Authority
NDC	Nationally Determined Contributions
NGO	Non-Governmental Organization
NRM	Natural resource management
NWFP	Non-wood forest products
PA	Protected Area
PC	Pasture Committee
PROFOR	Programme on Forests
RCP	Representative Concentration Pathways
RDF	Rural Development Fund, an NGO
RKDF	The Russian-Kyrgyz Development Fund
SAEPF	State Agency for Environmental Protection and Forestry
SDG	Sustainable Development Goal
SFE (<i>leskhoz</i>)	State Forest Enterprise
SFF	State Forest Fund
SFM	Sustainable forest management
SLF	State Land Fund
SLM	Sustainable land management
TCP	Technical Cooperation Project of FAO
The KyrgyzHydromet	State agency for meteorology, under Ministry of Emergency Situations
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
UNCCD	United Nations Convention to Combat Desertification

Executive Summary

1. Total officially reported forest area in the Kyrgyz Republic is 1.116 million hectares, or 5.6% of the total area of the country. 75% of the forests are grown on State Forest Fund (SFF), and 25% on Protected Areas (PAs) under SFF. In addition, 14% of natural pastures, or 1.2 million hectares are under SFF¹. However, the FAO reports a total area of 1.859 mill. ha under forests, including shrub forests (0.777 mill. ha). This leaves a slightly smaller (by 3%) area of forest with real tree cover, i.e. 1.082 mill. ha.
2. Other forests cover around 275,000 ha, and are located in the areas of Aiyl Aimaks (village communities / councils) and in land reserves. These forests mostly degraded because the issue on the rights of their operational management has not yet been resolved. These "municipal" forests have not been properly assessed or mapped, and the local government bodies have not been able to manage and protect from over-grazing and harvesting pressure by the local communities.²
3. The Kyrgyz forests consist of four main types: (1) spruce forests found in the eastern and central parts of the country and in the ranges north of the Fergana Valley; (2) walnut-fruit forests of global biodiversity significance since walnuts are indigenous and the area holds the largest walnut groves worldwide, in the northern and northeastern slopes of the Fergana mountain ridge; (3) juniper forests growing under arid conditions and dispersed over the country; and (4) riverside forests. In addition, poplars have been planted near or within settled areas for timber production, for construction and as windbreaks.
4. Forests and pastures are a vital source of wood and non-wood products such as timber for construction, carpentry, rural infrastructure and fencing, firewood, fruits, nuts, herbs, honey; and are used inter-changeably for grazing area, tourism, and collecting fodder and hay for livestock. Broadleaved forests such as walnut-fruit forests are often managed in traditional inter-cropping systems that resemble agro-forestry. Coniferous forests are typically monocultures with spruce and juniper as dominant species.
5. Forests and pastures are already under stress due to anthropogenic pressure in the Kyrgyz Republic. More than 30% of people live near forests and use forest resources and more than 60% of the entire population is involved in livestock keeping. Livestock herding today is a continuation of a long nomadic tradition in the country, and acts as an economic safety net. However, it produces unintended and serious consequences such as a continuing degradation of forests and pastures. Reduced productivity of pastures, decreased resilience of forest ecosystems to climatic stress, and increased exposure of communities to weather-related natural disasters, are increasing the overall vulnerability of communities and negatively affecting rural livelihoods.
6. There is a long-term forest area and quality decline, what has led into a timber and firewood shortage in the country. Official SAEPF figures show increases of forest area since the 1990s, but this is due to the statistical addition of land that was previously on collective and state farms. Lands were also added to the territories of ayil okmotu. Previously, these areas were not taken into account.
7. Demand for timber for construction and industrial uses is estimated to be around 500,000 m³ per year, but only 10% of that is satisfied from domestic forests. In addition, some 20,000 m³ of firewood is collected from the broadleaved forests every year. Especially the rural communities are

¹ Resolution of Kyrgyz Republic Government from July 26, 2011 No. 407. On approval of the results of the National Forest Inventory of the Kyrgyz Republic

² TCP/KYR/3603 "Support the Elaboration and Alignment of Forest Policy and Action Plan to SDGs and Climate Change Agenda"

fully dependent on firewood as a cooking and heating energy source. There are no alternative energy sources to replace firewood¹. There is currently a moratorium on harvesting high value forest species like walnut and juniper for timber and fuelwood. Even sanitary cuts are strongly regulated.

8. Climate change is exacerbating the critical situation of forests and pastures in Kyrgyzstan, as the two land use forms are inter-dependent and connected. Their sustainable management planning and implementation is undertaken, however, separately under different regulatory frameworks and institutional responsibilities. This approach is leading to fragmented and inefficient responses to climate change, and hindering an ecosystem-based management of the pastures and forest resources. Ecosystem-based approach is still a relatively new methodology to the country, the main challenge is to develop a common understanding and start a process of interactive co-operation between different actors (GIZ, 2015).
9. It is expected that summer temperatures will rise, while winters remain mostly unchanged. Precipitation changes will induce a significant reduction of surface water flows. This increases the heat stress in summer, which will pose severe negative impacts on the country's ecosystem, livelihoods and economy.
10. The proposed intervention in this GCF Project is aimed at reversing the forest area decline by collaborative and more effective afforestation/reforestation on poorer pastures and grasslands, and destroyed forests, respectively. Core target areas are in Suzak, Toguz-Toro, Ak-Talaa and Uzgen districts, located in Jalal-Abad and Naryn oblasts. Actions are designed to mitigate against forest conversion and degradation, and start replenishing the forest cover and quality. Important ecosystem and climate benefits will ultimately create alternative livelihoods that produce alternative income for the over-dependence on cattle, and its heavy toll on natural balance of sustainable landscapes.
11. While there is resistance towards changing the forest management planning into a mode of Collaborative Forest Management (CFM) based on open-source forest information, this GCF Project will advocate continuing a dialogue to that direction with the State Agency on Environmental Protection and Forestry (SAEPF). A change in the mindsets on optimizing institutional efficiency, and evolution of tasks and roles through a multi-stakeholder implementation, would lead to more effective reforestation and higher mitigation and adaptation impacts in forests. Collaborative forest management (CFM) is a joint forest management approach between government and community.
12. In January 2017, a new Budget Code was accepted, which affects leskhozoes negatively. Based on the new Code, leskhozoes have to transfer all the moneys they earned to the state budget, and then develop a forest program/plan to get resources back from the state coffer to finance their regular activities such as reforestation. Leskhozoes are poorly staffed and capacitated to develop these programs, what means that they do not receive money back from the Special Account for implementing sustainable forestry as before. Before 2017, leskhozoes used their collected fees from forest leases directly for planting of new forests.
13. A gradual reform of the forest management with a broader participation of non-state stakeholders will ensure achievement of environmental, economic and social objectives, and help building the climate resilience in the forest sector. Project continues the effort started by SAEPF on piloting a process of forest management reform in selected leskhozoes with a broadened stakeholders involvement.

¹ Muslim Razhpabaev. Scientific secretary of the Forest Institute. National Academy of Sciences of the Kyrgyz Republic. Interview in Bishkek - 24.kg news agency. September 21, 2015

14. It is suggested that the GCF Project helps fostering the widely accepted and tested strategies in decentralization on NRM (inc. Collaborative Forest Management, CFM), and partnerships between the public sector forest guardians (leskhozoes, aiyl okmotus, rayon administrations), the private sector and communities (Public-Private Partnerships, PPPs).
15. Based on the current performance of the tenure and agreements on pastures and forests, the Project will support further dialogue, policy analysis and innovation on the evolution of the roles played by various actors to perform on their highest possible efficiency. For example, some stakeholders incubate the idea that the State Forest Fund (SFF) concentrates in the future more on supervision and monitoring duties, and that the core of forest-related economic functions will be performed by CFM and PPPs involving communities, contractors and the private sector. There is a firm resistance to this from the leskhozoes, but discussion is on-going and worthy of attention.
16. By 2024, at least 6,000 hectares of severely degraded forest ecosystems are rehabilitated, expanded, diversified and managed by local stakeholders on the State Forest Fund (SFF) lands. Afforestation is the establishment of a forest or stand of trees in an area where there was no previous tree cover. Reforestation is the natural or intentional regeneration of existing forests and woodlands that have been depleted, usually caused by natural disasters or direct/indirect human activity.
17. Of the total target area, a minimum of 3,000 ha will be afforested/reforested on open lands. These will be multi-specie mixed or monoculture planted forests on barren, clear-cut or pasture land:
 - including Forestry Inventory Department's designated land for planting forests;
 - excluding dense (successful) forests already planted;
 - excluding areas planned for planting trees in the next 10 years (BAU);
 - including glades/trails without trees
 - at minimum such lands amount to 12,400 ha in core target areas
18. Another 3,000 ha will be subject to forest restoration through enrichment planting (under canopy) in degraded forests. For forest restoration (defined as enrichment planting on degraded forests with some tree cover; and in accordance with the Russian language definition, including assistance to the natural regeneration of forests):
 - including only areas inside open (50-80%) and light (10-50%) forests (according to canopy class definitions);
 - excluding lands defined unavailable according to zoning, and other unproductive land
 - at minimum such lands amount to 25,000 ha in core target areas
19. The third area of implementation is in improved forest management of existing forests (around 30,000 – 40,000 ha). This falls under the total outreach area considered by Project's integrated NRM and community climate resilience plans (INRMCRP) which is estimated at 530,000 ha. The rest of the total target area is mostly pastures, which will be brought under sustainable management plans. Minority of this land mass is forested, where any further deforestation will be avoided and degradation halted. On SFF grazing lands (but not on SLF pastures), it will be possible to plant also shelterbelts and windbreaks with trees to protect villages and animals from extreme weather stress.
20. Majority of forests in pilot area have a low canopy density i.e. are open (50-80%) or light (10-50%) forests. It is necessary to develop protective measures to save these seedlings from cattle grazing. Experiences from e.g. the Bazar-Kogon district can be drawn, where individual seedlings are protected (cost is 3 USD/each), or through perimeter fencing. The restoration process will be

implemented through the involvement of the local community on the principles of collaborative forest management (CFM) and PPP. Forests with low density will be transferred to long-term lease, and tenants will be responsible for the safety of planted trees.

21. In order to strengthen knowledge and local adoption of INRMCRPs, 300 people are trained on ecosystem-based approaches of INRMCRPs, and the underlying institutional and community-district level capacity is developed to help in the target area's 51 aiyl aimags. Impact is further scaled up in new Project areas in the North and North-West of Kyrgyzstan (doubling outputs)
22. 10 PPP partnerships per year are established under the principles of INRMCRPs, and these implement forestry and pasture management activities, which are georeferenced to facilitate reporting into NRM monitoring system. A seamless and untampered software system will be created to guard the integrity of data, and feed monitoring and reporting directly into relevant state and local authorities. Local self-governance groups are trained and engaged in monitoring on NRM.
23. Expected benefits:
 - 3,000 ha of new planted forests are created on open lands (afforestation/reforestation);
 - 3,000 ha low density forests are restored (under canopy enrichment planting);
 - At minimum 30,000 – 40,000 ha of forested lands falling under the 480,000 ha INRMCRP component of the Project will be brought under sustainable management plans, and their further deforestation avoided and degradation halted;
 - Mechanisms of involving of local community into forest management (CFM) are developed, tested and scaled up;
 - Local investments into forest plantations are stimulated and PPP approach on SFF land implemented;
 - Local community's income is stable or increased.
24. Regarding the carbon benefits, the intensity of contributions per area unit will be higher from forests than from improved pasture management, which affects the largest block of land in the target areas. The detailed classification of the total land area (tentatively 530,000 ha) between pastures and forests in land use will have to be achieved for a more definitive carbon assessment, keeping in mind that changes in land use classes need formal permission, are reflected in cadastre, and are regulated by either the government or the local district administration. Tentative calculation of the carbon sequestration from afforestation/reforestation of 6,000 ha yields 2,106 million tons CO₂ eq in the 8 years implementation phase and 12 years capitalisation phase. In forest restoration activity, from 10,000 ha the carbon sequestration will be 0,632 million tons CO₂ eq for the same time periods.

Introduction: Rationale for Forestry Intervention

25. There are several forest classes in Kyrgyzstan. The lands of the State Forest Fund include the following types (Table 1.).

Table 1. Types of forest in State Forest Fund

1. Forest lands, including forests (covered with forest vegetation of land) and forest lands not covered by forest vegetation (unclosed forest cultures, plantations, nurseries, felling, burning, fires, clearings, wastelands);
2. Non-forest lands that form a single natural complex with forests (agricultural and other land areas), as well as lands on which the forest was reduced in the construction of facilities related to economic activities - roads, fire breaks, power lines, pipelines).
3. Tree and shrubbery vegetation apart of the forest fund:
4. Stand-alone trees and groups of trees, shrub vegetation and agroforestry plantations on agricultural land;
5. Protective plantations on the outlets of railways and highways, canals and other linear structures;
6. Trees and groups of trees and bushes, planting plantations in cities and other settlements (except for urban forests) in the backyard, garden and garden areas.
7. Specific tree-shrub vegetation can be under the jurisdiction of various state institutions and in private ownership. It also performs important environmental, health, and sanitary-hygienic functions. It is also affected by climate change and needs adaptive measures.

26. Forests and pastures, already under stress due to anthropogenic pressure, are among the most climate-sensitive resources of Kyrgyzstan. Over-grazing of cattle in slopes and in young forests results in poor regeneration and soil erosion. Reduced productivity of pastures, decreased resilience of forest ecosystems and increased exposure of communities to natural disasters, are increasing the overall vulnerability of communities and negatively affecting rural livelihoods. More than 30% of people live near forests and use forest resources and more than 60% of the entire population is involved in livestock keeping. This stresses forest resources both directly (grazing and fodder), and indirectly (firewood needs for cooking, heating and meat / skin processing). The widespread behavior of keeping a high number of low productive livestock as a source of cash income serves as a safety net which is harmful to the forest ecosystems. In addition, the rural economy is narrowly envisioned, lacking alternatives for off-farm employment and livelihoods.
27. The Kyrgyz forests face severe degradation also due to the extensive use for fuelwood and housing and fencing construction. Demand for timber for construction and industrial uses is estimated to be around 500,000 m³ per year, but only 10% of that is met with from domestic forests. In addition, some 20,000 m³ of firewood is collected from the broadleaved forests every year. Especially the rural communities are fully dependent on firewood as a cooking and heating energy source. There are no alternative energy sources to replace firewood¹.
28. There is currently a moratorium on harvesting high value forest species like walnut and juniper for timber and fuelwood. Even sanitary cuts are strongly regulated. In such firewood market conditions, a two-pronged approach is (i) to address firewood supply as part of the afforestation/reforestation activity; and (ii) to improve burning techniques to lower wood volumes and increase household energy efficiency on the demand side.

¹ Muslim Razhpabaev. Scientific Secretary of the Forest Institute. National Academy of Sciences of the Kyrgyz Republic. Interview in Bishkek - 24.kg news agency. September 21, 2015

29. The country's fragile mountain topography, combined with depletion of forest cover, results in wind and water soil erosion on sloping lands. Other interrelated problems relate to risks of landslides, mudflows and flooding due to poor storage basin management, unsustainable use of water resources and deterioration of water quality due to sedimentation.
30. Other common reasons for forest degradation in the Kyrgyz Republic include:
- Natural imperatives (harsh and dry climate)
 - Long gestation of forest resources for timber
 - Developmental pressures (roads, settlements, and other infrastructure)
 - Lack of sound and dynamic forestry sector policies and indifferent implementation regimes
 - Low priorities and lack of political awareness and commitment
 - Management failures and low funding to the sector
 - Ineffective forest management plans, and their poor integration with broader natural resource management (NRM)
 - Lack of effective participation of local communities in forest management
31. While the need to increase resilience to climate change in rural areas is understood by policy makers and other stakeholders, the country's approach to Natural Resource Management (NRM) lacks coherence and fails to orchestrate concerted efforts and cross-sectoral coordination of actions. Planning and implementation of pasture and forest use is undertaken separately under different regulatory frameworks and institutional responsibilities, hindering an ecosystem-based¹ approach which, while taking into account connectedness and interdependence of the pasture and forest resources, would also have greater mitigation and adaptation impacts.
32. One approach in bridging between pastures and forests is to bring back the sustainability of agro-forestry, or agro-silvo-pastoral systems, as a multifunctional management approach in the most valuable and threatened nut-fruit type of forests. In the reality of Kyrgyzstan, current management systems involve local communities who have traditional knowledge on combining e.g. trees and other perennial woody plants, hay-making, grazing, cash crops and nut collection, but fail to keep their system sustainable under livelihood pressure. Some previous studies indicate that Kyrgyzstan's agro-forestry practice requires urgent improvements to deliver rural sustainable development. (Rehnus, M., Nazarek, A., Mamadzhano, D. et al. Journal of Forestry Research (2013).
33. A high number of stakeholders are involved in the land management (households, herders, PCs, leskhoz, SAEPF, pasture department, Ministry of Agriculture, Food Industry and Melioration, Giprozem Land Registry, ARIS Community Development and Investment Agency, etc.). Pasture committees only plan for pasture use on their land. Forest management units develop forest management plans without attention to their pasture lands despite the fact that pasture committees use them several months per year. There is an obvious lack of tools to integrate forest and pasture management in the current planning frameworks used by pasture committees and forest management units.
34. On the ground, the boundaries of management plans between pastures and forests are often unclear and commonly violated. There is confusion and negligence of land tenure and resource use arrangements, which contributes to the overexploitation of forest lands. Livestock affects forests also when animals are herded from villages to mountain pastures, and when they access water points located in forest areas.

¹ The ecosystem approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way (Convention on Biological Diversity, 1992).

35. Forest and pasture managers rarely cooperate and consider the interests of each other in planning and management. They do not have specific tools for this, neither discussion platforms where they could openly exchange. They are often not aware of the issues and interests of the other group. As a result, they lack capacities, knowledge and mechanisms to engage into a fruitful multi-stakeholder dialogue that would result in a more coordinated management at the local level.
36. Another important and partly untapped contribution of forests is on supporting food security and gender empowerment. In conclusion of the observed challenges in agriculture, food and water sectors, as well as wood fuels and household incomes, the multiple benefits of forests to food security may not have been fully realized in Kyrgyzstan. According to FAO (Committee on World Food Security, HLPE on Food Security and Nutrition, 2017), forests contribute to the resilience of food systems and gender in multiple ways, in addition to providing fodder and grazing land to livestock:
- Provide direct complementary food supplies: e.g. wild meat, agro-forestry crops and non-wood forest products;
 - Generate household income for purchasing food from the local market;
 - Empower gender equality and roles in food security;
 - Offer local cooking energy for healthy and safe food preparation;
 - Provides healthy agro-ecosystem and environmental services (soil, water and nutrient circulation, pollination, etc.)

The international and national commitments of Kyrgyzstan on sustainable management of forests

37. The benefits from forests to sustainable development have been widely acknowledged. The 2030 Agenda for Sustainable Development places sustainable use of ecosystems, including forests, as a key tenet of the development vision (and in particular, SDGs 13 (climate action) and 17 (life on land). Paris (Climate) Agreement, which entered into force on 4 November 2016, highlights the important contributions of forests to climate change mitigation and adaptation. The Kyrgyz Republic signed the Paris Agreement on 21 September 2016, but it has not yet ratified it.
38. Many countries are drawing up their (intended) nationally determined contributions (NDC) to climate change mitigation, and a majority of them have emphasized the prominent role of forests. Kyrgyzstan has drafted INDC in 2015, but it has not yet ratified these into NDCs (Government of the Kyrgyz Republic, 2015). The Kyrgyz Republic's greenhouse gases (GHG) emissions are relatively low by international comparison: 0.023% of the world total from fossil fuel combustion (2010). As the country's population was 0.079% of the world's total, per capita GHG emission in the Kyrgyz Republic is less than one-third of the world average. However, the planned economic development will lead to a sharp increase in greenhouse gases emissions, which requires determined actions to reduce them in the future. (The Kyrgyz Republic Intended Nationally Determined Contribution submitted to the UNFCCC, 2015)
39. The most vulnerable sectors and expected economic losses in absence of adaptation actions are as follows: water USD 718 million, energy USD 200 mill., healthcare USD 110 mill., forestry USD 94.80 mill. and agriculture USD 70 mill. (Annual losses are calculated in 2005 US dollars under the temperature increase by 5 Celsius degrees relative to 1961-1990 level.). These are the priority sectors in climate change adaptation action. In reality, the balance between adaptation and mitigation in the climate-related development finance recorded in the OECD DAC CRS is showing that commitments to mitigation (69%) were much larger than to adaptation (10%) and multi-focal

projects (21%). Kyrgyzstan's participation in the Pilot Program for Climate Resilience of the Climate Investment Funds was approved in 2015. (OECD, 2016)

40. Kyrgyzstan has also communicated mitigation targets to reduce greenhouse gas (GHG) emissions by between 11.49% and 13.75% below business as usual (BAU) levels in 2030. Kyrgyzstan has also pledged to reduce GHG emissions by between 29.00% and 30.89% below BAU levels in 2030, contingent on international support (e.g. finance, technology and capacity building). (OECD, 2016)
41. Technical and methodological progress in combining Geographical Information System (GIS) and Remote Sensing (RS) into effective georeferencing tools allows for better monitoring of forest cover and condition, carbon stock changes over time, and investments affecting the flows of harvested wood products (HWP).
42. Forests can play an evidence-based and prominent role in strategies for transitioning to low-carbon economies. As concrete actions for achieving the SDGs and climate change mitigation targets and national adaptation plans (NAP) move to the centre of attention, the importance of sustainable management of forests (SFM) carries more weight as a contributing solution to climate change.
43. Sustainable Forest Management (SFM) is a dynamic and evolving concept and aims to maintain and enhance the economic, social and environmental value of all types of forests, for the benefit of the present and future generations. The following seven thematic elements, derived from regional and international processes on criteria and indicators of SFM, have been generally accepted as key principles of SFM internationally. These will formally guide the commitment of Kyrgyz Republic to SFM:
 - Extent of forest resources: maintaining significant forest cover and stocking;
 - Biological diversity: its conservation and management;
 - Forest health and vitality: reducing fires, pollution, invasive species, pests and diseases;
 - Productive functions: maintaining production of wood and non-wood forest products;
 - Protective functions: in relation to soil, hydrological and aquatic systems;
 - Socio-cultural and economic functions: the support provided by forests to the economy and to society;
 - Legal, policy and institutional frameworks that support the implementation of above elements.
44. The government has faced challenges in the proper implementation of its existing forest policies. Analysis by the FAO-GEF project outlines major reasons for this such as: the centralised, top down nature of management structure within the sector; the lack of adequate information and investment in the sector; weak capacity; and perverse incentive structures (e.g. insufficient transparency in 22 operations of the leasing of pasture/land for orchards, timber and firewood sales of the leskhozoes). (GEF, 2014).
45. Kyrgyzstan is a signatory of the following international commitments involving forests:
 - In 2000, Kyrgyzstan ratified the United Nations Framework Convention on Climate Change (UNFCCC), which determined that forests are a key climate solution.
 - The UN Convention to Combat Desertification (UNCCD), where agroforestry was recognized as means of combating land degradation.
 - The UN Convention on Biological Diversity (CBD), which developed a 2011-2020 Strategic Plan including the Aichi Biodiversity Targets.
 - The 2030 Agenda for Sustainable Development and its 17 Sustainable Development Goals.
46. On national level, Kyrgyzstan has announced that conservation of mountain ecosystems, biodiversity and forests are some of the priority areas of climate action in the country (Government

of the Kyrgyz Republic according to GIZ)¹. Numerous policies and specific legislations were drafted to develop and regulate the forestry sector in the Kyrgyz Republic. A Presidential Decree, *"The Concept of Development of the Forestry Sector"* was issued in May 1999 with the stated objective of promoting sustainable development in the forestry sector through improved management and partnerships with the private sector.

47. In 2005, the *National Forest Program for Supporting the Implementation of the Concept of the Development of the Forest Sector* (2005-2015) was developed, along with the *National Action Plan for Development of the Forest Sector* (2006-2010), while the *Forest Code* was updated in 2007. Currently, the procedure for *Use and Disposal of the State Forest Fund* (Regulation 192) is under development. This new regulation should replace the existing Decree 482, which governs the state forest enterprises in the Kyrgyz Republic.
48. In the period from 2015 to 2017 a detailed review and evaluation of the national forest policy was carried out in view of the changes taking place at the global and national levels. Recommendations on policy adjustments were made but their adoption has not been decided or promoted to date.
49. FAO-GEF project *"Sustainable management of mountainous forests and land resources under climate change conditions"* and the TCP project *"Support the Elaboration and Alignment of Forest Policy and Action Plan to the SDGs and Climate Change Agenda"* have been implemented in support to the development of *"Concept for Forestry Development until 2040"*.
50. The State Agency on Environmental Protection and Forestry (SAEPF) is piloting a process of forest management reform in selected leskhozoes with a broadened stakeholders involvement. The Government of the Kyrgyz Republic approved this initiative (Decree of the Government of the Kyrgyz Republic dated 16 June 2015 #367). In addition, the government of Kyrgyzstan had programs and action plans for adaptation to climate change on *"Forest and Biodiversity"* 2015-2017. These were aimed to strengthen the resilience of the Kyrgyz's forest and biodiversity to the adverse effects of climate change on natural ecosystems and communities.

Forest Sector Performance

51. Forestry (including hunting) is a small economic sector in the Kyrgyz Republic, with a 0.05% contribution to the GDP. Kyrgyzstan imports more than 90% of its needs of industrial wood and sawn timber because the domestic wood processing is under-developed and lacks sustainable supply of good quality logs. Improved forest management would contribute to import substitution and more importantly, help in the development of ecotourism and valuable non-timber forest products (walnuts, almonds, pistachios, honey, medicinal plants, herbs, etc.)
52. The performance of the forest sector in the Kyrgyz Republic can be assessed against the achievement of the main functions of the authorized state forestry body. According to the Forest Code of the Kyrgyz Republic, this body is the government of the Kyrgyz Republic - represented by the State Agency for Environmental Protection and Forestry (SAEPF). One of the main tasks in SAEPF is the development of the provisions, rules, instructions and other normative legal acts aimed at the natural regeneration, protection, and use of forests. The success of the implemented policy should be assessed against increasing the forest cover through natural regeneration of the forest and planting of new forests over time.
53. Although this work is aimed at improving activities in the field of natural regeneration, protection and use of forests, the results of weak implementation of the existing provisions are evident, when

¹ Climate Change Adaptation Programme and Action Plan for 2015-2017 for The Forest and Biodiversity Sector, Bishkek, 2016

considering the performance in forest management. The example of the Ak-Talaa forestry, where 84% of the plantations are unsatisfactory or dead, and the Kara-Alma forestry where the dead forest plantations are 36%, in poor condition 25%, allow to conclude that the adopted regulations, instructions and other by-laws do not bring the desired result on the natural regeneration of the forest. It should also be noted that the main cause of death of new forest in Kara-Alma forestry is a livestock grazing - 70%. This is stated in the materials of the forest inventory in 2006, but no action is taken to regulate grazing in forest areas. The lack of measures to address this problem indicates either a weak communication between departments of SAEPF, or the lack of a willingness to address them. Thus, the implementation of the policy in the field of forest protection and increasing the forest cover is neither carried out at the proper level, nor monitored with appropriate accountability.

54. However, this conclusion does not match with the officially reported forestry data. According to the official data, the forest area has increased by 9.9% (or by 104,900 ha) during the last 5 years¹. Official SAEPF figures show increases of forest area since the 1990s, but this is due to the statistical addition of land that was previously on collective and state farms. Lands were also added to the territories of ayil okmotu. Previously, these areas were not taken into account.
55. There is a long-term forest area and quality decline, what has led into a timber and firewood shortage in the country. Demand for timber for construction and industrial uses is estimated to be around 500,000 m3 per year, but only 10% of that is met with from domestic forests. In addition, some 20,000 m3 of firewood is collected from the broadleaved forests every year. Especially the rural communities are fully dependent on firewood as a cooking and heating energy source. There are no alternative energy sources to replace firewood².
56. The State Agency on Environmental Protection and Forestry (SAEPF) is piloting a process of forest management reform in selected leskhozoes with a broadened stakeholders involvement. The Government of the Kyrgyz Republic approved this initiative.³

SWOT analysis of the forest sector

57. Table 1 summarizes the SWOT Analysis of the Kyrgyz forestry sector. Perhaps the most critical underlying political issue is the revised budget financing of leskhozoes on implementing SFM. In January 2017, a new Budget Code was accepted. Based on the new Code, leskhozoes have to transfer all the moneys they earned to the state budget, and then develop a forest program/plan to get resources back from the state coffer to finance their regular activities such as reforestation. Leskhozoes are poorly capacitated to develop these programs, what means that they do not receive money for implementing sustainable forestry as before. Before 2017, leskhozoes used their collected fees from forest leases directly for planting of new forests.
58. Another key challenge is a governance matter related to the resistance to change at SAEPF and leskhozoes. Even though pilot testing of Collaborative Forest Management (CFM) has been tried, the leskhozoes are neither free to set their own targets, nor incentivized for exceeding them in implementation.
59. Third issue is that the associated Public-Private Partnership models are still in their early stages and there are few assessments. These are sometimes perceived as threats to the old structures in

¹ National Report on Environment in the Kyrgyz Republic for 2006-2011, approved by the Government Resolution

² Muslim Razhpabaev. Scientific secretary of the Forest Institute. National Academy of Sciences of the Kyrgyz Republic. Interview in Bishkek - 24.kg news agency. September 21, 2015

³ Decree of the Government of the Kyrgyz Republic dated 16 June 2015 #367

the Kyrgyz forestry because they lower/eliminate rent-seeking opportunities and increase the need for full transparency of operations and data.

Table 2. Forest Sector SWOT Analysis

Strengths	Weaknesses
<ul style="list-style-type: none"> - There are several natural high-value forest types which yield both wood and non-wood forest products. - The importance of forest conservation is well recognized at all levels of the society. - The coverage of Protected Areas has been increased from 4.3% to 6.3% since 2005. - The forest inventory system is functioning and includes forest management plans, national forest inventory and state forest fund accounting. - The forest sector of Kyrgyzstan is actively involved in the FAO global forest resource assessment. - The system of implementing sustainable forest management is in place: forest management plans, forest leases and logging licenses on competitive bidding, regeneration of forests, forest nurseries, planted forests, etc. - Joint forest management is developed through collaborative forest management (CFM). - A new Budget Code has been adopted, which is the basis for reforming the forest financing system 	<ul style="list-style-type: none"> - Intersectoral cooperation with ministries and departments with respect to the conservation and growth of forests is insufficient. - Integrated forest management plans are not developed. - Social and economic aspects are not always duly considered during a creation of protected areas. - Information on national forest inventory, forest inventory and state forest fund accounting are not fully utilised in operational management and planning. - Implementation of forest management activities by the private sector is not regulated by law. - The norms of CFM, prescribed in the regulation, do not allow to fully implement the principle of community participation. - Methodology for calculating forest management fees is not yet approved. - SAEPF is unwilling to adopt a CFM approach due to loss of their leverage. - Capacity of Forestry Enterprises is insufficient for implementing forest plans, according to the new 2017 Budget Code.
Opportunities	Threats
<ul style="list-style-type: none"> - Improvement of legal framework and enforcement - Linkages to Green Economy development process - Adoption of CFM and changing of regulations on public-private partnerships in forestry - Capacity Building and strong support from FAO under REDD+ Programme - Climate Finance Secretariat to channel additional international funding to forestry sector - Diversification of financing sources of Forestry Enterprises - Development of effective regulations based on analyses of current situation - Introduction of ecosystem-based integrated forest management planning approach - Generation of transparent GIS, remote sensing analysis, and other area data from international sources - Integrating forest and pasture management through INRMCRPs 	<ul style="list-style-type: none"> - Lack of political will to forest sector reforms (esp. in SAEPF) - Low human capacities to implement the forest sector reforms and CFM - Continuous scaling up of number of livestock and grazing areas - Failing response to the underlying socio-economic reasons for forest degradation (rural unemployment and narrow livelihood options, high timber and fuelwood demand) - Worsening of land degradation and desertification, leading to local threats to food security and agricultural production - Continued unavailability of public forest sector data from SAEPF Forest and Hunting Inventory Department - SAEPF and leskhozoes not adopting long-term (5+45 yr.) forest land leasing system

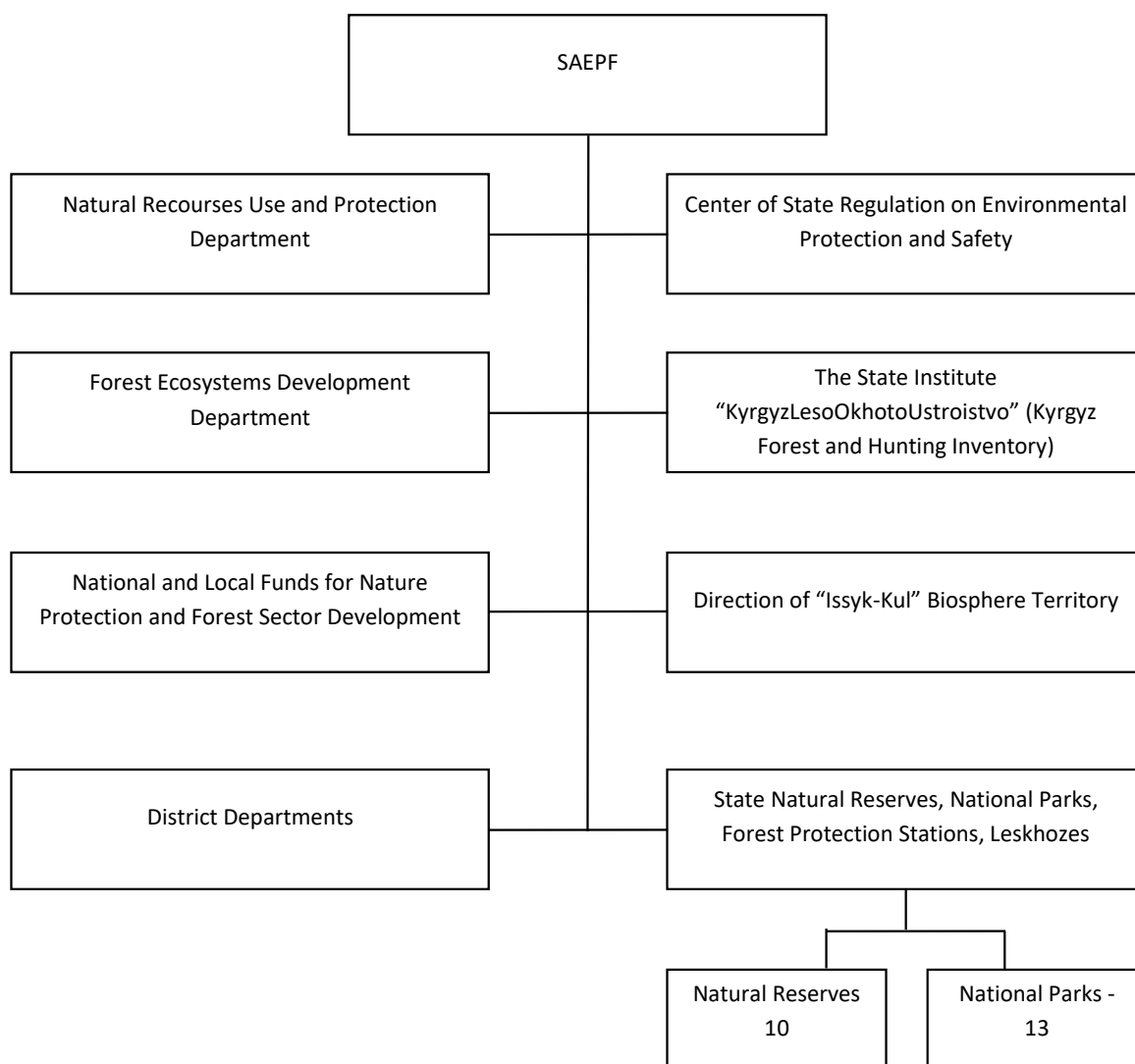
State Institutions and Support to the Forest Sector

60. The main financing for the forest sector comes from the state. This is determined by the existing organization of the state governance of natural resources, because most of the forests belong to the state, and a small minority are on communal lands. The state budget allocates funds to the State Agency for Environment Protection and Forestry (SAEPF). 88% of the allocated budget mainly

covers staff remuneration expenses and wages as well as dues to the Social Fund (the law requires employers to pay 17.3% of the salary as dues to the Social Fund). The other 12 % covers trips, communal services, transport, and maintenance of infrastructure. All incremental expenses, as well as all activities and projects, must be covered by the revenue from “special means”. Special Means’ is direct collection of funds from the provision of services, e.g. user or permit fees¹.

61. The revised structure of the SAEPF and its departments is presented Figure 1 below.

Figure 1. State Agency for Environment Protection and Forestry (SAEPF): Organisational structure



¹ A. Temirbekov. Facilitating Financing for Sustainable Forest Management in Small Islands Developing States and Low Forest Cover Countries: Country Case Study: the Kyrgyz Republic, Helsinki, 2010

62. The Government of the Kyrgyz Republic has decided for a transition to green economy as a key tenet for sustainable development. Green economy as a strategic decision values natural capital as an important renewable factor of production, and includes alignment with resource-efficient and low-carbon development. It is based on the increasing use of renewable resources for energy and sustainable consumption and production.
63. Kyrgyzstan has not yet developed conceptual and legal norms to promote the elements of the green economy and disseminate their use. Awareness raising and preparatory work is underway with support of the UNDP, and it is targeted especially in the small and medium enterprise (SME) business sector. Preparedness phase is expected to continue until 2019, so this Project can propose linkages with Green Economy Strategy during its implementation. Forests and pastures are relevant because the Green Economy Strategy promotes especially SDG Goal 8. "Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all".
64. SWOT Analysis of Forest Institutions is presented in Table 3.

Table 3. Forest Institutions SWOT Analysis

SAEPF	
Strengths	Weaknesses
<ul style="list-style-type: none"> - Is entrusted with the vision of the forestry sector development - has monitoring and compliance enforcement power 	<ul style="list-style-type: none"> - Understaffed, underfinanced, limited capacities - Low Government priority to environmental protection and forestry
Opportunities	Threats
<ul style="list-style-type: none"> - SAEPP can play key role in development of standards of sustainable use and their enforcement - Leskhoz management reforms are underway supported by the WB Project 	<ul style="list-style-type: none"> - High turnover of management and staff can lead to change in vision and forestry development roadmap - Low budgetary support undermines maintenance of capacity and facilities - Resistance to change
Leskhoz	
Strengths	Weaknesses
<ul style="list-style-type: none"> - Have good understanding of forest resources - Know local trees, nuts, fruits and shrubs for planting - Have trained forest rangers and field exposure 	<ul style="list-style-type: none"> - Weak capacities of the staff - Limited number of staff to undertake planning and management of forest - Management often political nominees by the regional authorities, resulting in high turnover - No access to new technologies, know-how - Do not have full autonomy, since plans are formulated mostly at the national level, resource use fees are decided at the national level
Opportunities	Threats
<ul style="list-style-type: none"> - Several leskhoz started introduction of new methods in management of forests, such as PPP, CFM, outsourcing forestry activities to private sector - Under pressure from local governments and communities to cooperate 	<ul style="list-style-type: none"> - Low interest and distorted incentives to engage communities and local government bodies in planning and management - Lack of funds to undertake implementation of management plans - Lack of incentives to reform
Local government bodies (aiyl okmotu and aiyl kenesh)	
Strengths	Weaknesses
<ul style="list-style-type: none"> - Accountable to local communities - Interested to support economic development and poverty reduction of constituent communities 	<ul style="list-style-type: none"> - Lack of technical staff and resources - High turnover of heads of local government bodies
Opportunities	Threats
<ul style="list-style-type: none"> - Should be engaged in management of local resources - Can support bargaining power of communities with leskhoz 	<ul style="list-style-type: none"> - Political pressures from vested interests - Low understanding and interest in environmental protection and climate change

Adopted from: Evidence-Based Strengthening of the NRM Governance - Sector Assessment and Recommendations for the CS-FOR Project (A. Undeland and A. Achilova)

Stakeholder Assessment

Table 4. Forestry and Pastures Public Sector Stakeholders

Name of Agency	Tasks related to Forestry
Climate Finance Secretariat	National Designated Authority for the GCF Project
State Agency for Environmental Protection and Forestry SAEPF	Lead Agency on Forests: political support, monitoring and support of activities on forest planting and restoration, interagency cooperation, implementing partner in the GCF Project
The Forest and Hunting Inventory Department of SAEPF	Develops forest management plans for the Forest Management Units (FMUs)
State Inspectorate for Environmental & Technical Safety (under the Government)	Inspection of forest management actors in cases of violations such as ecological catastrophes, illegal logging cases, and similar
Ministry of Agriculture, Food Industry and Melioration (MAFIM)	Involved in the creation of forests to perform water protection
The Ministry of Emergency Situations	Protects the population and territories from emergency situations of natural and technogenic character. Advise project on choosing right areas for planting trees for slope protection
The Ministry of Justice	Regulatory support activities on forestry sector
Ministry of Economy	Oversees socio-economic progress and sustainable development
The Ministry of Finance	Ensures the effective management of public finance in forestry
Department of pastures, livestock, fisheries	The use of forests for grazing
State Design Institute of Land Management "Kyrgyzgiprozem"	The land and cadastral works
The Agricultural Projects' Implementation Unit (APIU) and the Department of Pastures	Consultation for joint strategy development
The Ministry of Transport	Planting and maintaining trees along roads, tracks
Pasture User Unions "Kyrgyz Jaiyty" (AKJ)	Consultation and awareness raising among pasture users
The State Committee for Industry, Energy and Mining	Functions related to the development and implementation of state policy in the sphere of subsoil use on forest land
The National Statistical Committee	Carries out and coordinates the state statistical work in the field of accounting and forestry statistics
Cadastre Department and the registration of rights to immovable property of the State Registration Service	Regulates the issues of accounting and land acquisition
Public Agency on Geodesy and Cartography	Provides topographic and geodetic data and cartographic products
State Agency for Local Governments	Inter-agency cooperation with local governments* (<i>Aiyl okmotu**</i> , <i>Aiyl kenesh***</i>) on forest management issues
Regional state administrations and district administrations	Activities of forest management
Forest Research Institute of National Academy of Sciences	Scientific support to the development of forestry, developing and improving standards, procedures, guidelines for SFM
Universities: Kyrgyz State Agrarian Skryabin, Issyk-Kul State, Tynystanov, Jalal-Abad State	Organization of training specialists in forestry courses
Association of forestry land users in Kyrgyzstan	Supports initiatives of local communities on joint forest management, protects the rights of communities and households
Rural Development Fund (RDF) and CAMP-Alatoo (NGO)	Conducts sociological research, develops and facilitates joint forest management, social mobilization, pasture management plan development, and integrated natural resource management plans
The Russian-Kyrgyz Development Fund (RKDF)	Investments for planting fruit plantations
The Kyrgyz Scientific-Research Institute of Livestock and Pasture (KSRILP); the Kyrgyz Scientific-Research Veterinary Institute (KSRVI) under MAFIM	Scientific backstopping, pasture management plan development

Source: Concept for Forestry Development until 2040

* in small settlements of up to 20 villages; ** executive body at ayil aimak level; *** locally elected council

Past and Ongoing Development Projects

65. Purpose of compiling the past and on-going projects in forest sector is to support full complementarity and effectiveness of this GCF intervention. In the inception phase a project document and results review and personal interviews will be organized to collect data, and understand tools, guidance, methodologies and lessons learned produced by others in the past projects. With on-going projects linkages will be established to strengthen impact of this GCF project, as well as avoid duplication of efforts, tools and platforms.
66. The Swiss funded Kyrgyz-Swiss Forestry Support Programme (KIRFOR) 1995-2009, introduced Collaborative Forest Management (CFM)¹. Project assisted the Government to implement a programme of forest policy and sector reform. Work was piloted in two leshozes (Ortok and Usken) to develop a lease model for CFM. It was quickly expanded into a national programme and was subsequently rolled into a national policy (National CFM Regulations Decree No 377 in 7 July 2001). (PROFOR/RDF, 2011).
67. The CFM was implemented in several leshozes with walnut forests in the southern part of the Republic, where pressure on the natural walnut forests was high. The development of the lease arrangements was an important milestone in sharing economic benefits with local community members. Under these leases, individuals obtained the right to harvest walnuts in a specific area in exchange for planting walnut seedlings provided by the leshoz. The use of in-kind labor allowed the SAEPF forest planting activities to continue.
68. Afforestation of depleted / degraded walnut forests was a major objective of southern leshozes. A Board specially convened to implement the pilot CFM program handled disputes and mediated changes to the contracts. The user fees consisted of labor inputs to afforestation, although government soon promoted the move away from in-kind to cash payments.
69. Project titled "Rehabilitation of floodplain forests of the Kyrgyz Republic" implemented by UNDP Kyrgyzstan, in Issyk-Kul region (2010-2013). Main aim was a sustainable multi-sectoral forest management contributing to the conservation of the globally important diversity of riparian forest ecosystems, increasing carbon flows, reducing land degradation and improving livelihoods.
70. With support from the German Development Cooperation (GIZ), the "Forest Management Program" SAEPF is implementing projects supporting forest management since 2014 (USD 200,000). GIZ mainly worked on establishing of Joint Forest Management Councils (JFMC) and sensitized communities and increased their awareness of forest reform. The main results so far have been:
- Support to JFMC and institutional strengthening;
 - Introduction of the integrated land management approach;
 - Support and facilitation in the process of transferring SAEPF economic functions to the private sector;
 - Support to JFMC in communicating with the stakeholders.
71. Under JICA's five-year project, *Support for Joint Forest Management in the Kyrgyz Republic (2009-2014)*, the SAEPF and the National Agency for the Affairs of Local Self-Governance (NALSG) piloted joint forest management (JFM) practices at 10 pilot areas of Chui and Issyk-Kul oblasts. It involved the planting of fast-growing fruit trees, support to nurseries and provided irrigation systems, following the JFM implementation guidelines designed for this purpose. This meant engaging local community in decision-making with respect to sustainable forest management and actually

¹ Walnut value chain study findings, Programme on Forests and Rural Development Fund, 2011. Funded by World Bank.

delegating implementation of many forest management activities to the forest users themselves (USD 900,000).

72. Under the Kyrgyz-German inter-governmental programme on “*Exchange of Debt for Environment Protection*”, supported planting of fast-growing willow trees in water protection areas and lands prone to flooding under the aegis of ARIS Community Development and Investment Agency (USD 650,000, 2012-2014). This was part of a debt write-off for a total amount of EUR 8.5 million between Germany and Kyrgyzstan.
73. According to the KFW project coordinator from ARIS, 320 ha forest, mostly poplar and less salix, were planted on municipal land and on SFF. All lands were defended as unproductive land by KyrgyzGiprozem. Project bought seedlings and transported to the planting sites. Other expenditures for planting and fencing were borne by tenant. Local municipalities rented out lands to local tenants. As a payment, tenants have to give for municipality 20-30% of their needs of wood. In the South plantation lease size by one tenant is up to 1ha, in the North up to 5 ha. Non-accessible lands are planted by municipality.
74. With support from the FAO Project “Capacity Building for National Forest and Tree Resources Assessment and Monitoring”, the SAEPF undertook a National Forest Inventory (NFI) for defining and completing the data on forests in the country. The NFI project, which adopted the IPCC guidelines and general recommendations for carbon estimations, was completed in 2014. The results have not yet been inserted into the process of carbon reporting.
75. With support from the Korean International Cooperation Agency (KOICA) project on “*Capacity Building on Forest Conservation in the Kyrgyz Republic*”, a Research Center on forest pests control is being established in Chui oblast. This is to become a center of quality control for forest tree seeds, research and control on pest and forest disease control and transfer of technologies and know-how (USD1 million, 2012-2015).
76. With support from the EU, the “Forest Law Enforcement Governance (FLEG)” program also supported forest management with the aim to strengthen forest governance (2013-2015, USD 350,000). This is insufficient against the background that in 2017, Kyrgyzstan recorded 249 cases of illegal logging (in 2014 there were 622 cases). A moratorium on cutting trees in the nut forests of Arslanbob was introduced for 10 years.
77. Project on “Sustainable management of mountainous forest and land resources under climate change conditions” started implementation in five oblasts of the Kyrgyz Republic for the years 2014-2018. It is supported by the GEF, the FAO, the IFAD and GIZ (with significant co-financing from SAEPF). It aims to enhance the enabling environments for maintaining flows of the ecosystem services such as carbon stocks. The project is also closely linked with the country’s efforts for poverty reduction through enhanced productivity of mountainous silvo-agropastoral ecosystems as well as the mountain livelihoods of the country (FAO&GEF, 2012).
78. Biodiversity Conservation and Poverty Reduction through Community-based Management of Walnut Forests and Pasture is a project supported by Germany through GIZ (grant of USD 6.5 mill. for 2014-2018). It introduces a modern sustainable forest and pasture management model in southern Kyrgyzstan (Jalal-Abad region). Promotes the conservation of biodiversity, and supports adaptation to climate change and increase local incomes. Three action areas: (i) support state agencies and local communities (state forest enterprises, pasture committees, local self-government, etc.) to develop a joint management model for natural resources, with active involvement of the forest and pasture users; (ii) increase the forested area by planting walnut and fruit trees, which are well-adapted to climate change; and (iii) improve livelihoods of the local population. SAEPF and the Ministry of Agriculture and Melioration of the Kyrgyz Republic are local

partners.

79. GIZ and SAEPF, in collaboration with NGOs, is implementing a *Regional Project on Ecosystem-based Adaptation to Climate Change in High Mountainous Regions of Central Asia (Kazakhstan, Kyrgyzstan, Tajikistan)* in 2015-2019. It introduces an ecosystem-based approach to climate adaptation, in which people continue to use natural resources to secure their livelihoods without harming the environment. The objective is to test ecosystem-based adaptation and other climate adaptation strategies and to integrate them into national policies.
80. *Sustainable and Climate Sensitive Land Use for Economic Development in Central Asia* is a Regional Programme by GIZ in Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan (2016-2019). It adopts integrated, economically and ecologically sustainable forms of land use, which are climate change compliant. In Kyrgyzstan, pilot implementation of the forest sector reforms began in June 2015. Six forestry enterprises are now testing innovative and adapted mechanisms for decentralised, participatory management, and the activities are coordinated at the national level by the Coordination and Consultative Council, which includes representatives of governmental and international organisations and the civil society.
81. The World Bank started to finance the GEF's Integrated Forest Ecosystem Management Project in 2017-2021, in order to strengthen the capacity of government institutions and communities to improve sustainable forest ecosystem management through investments in management planning, ecosystem restoration, and infrastructure. The development objective of this USD 16.11 million project is to strengthen the capacity of government institutions and communities to improve sustainable forest ecosystem management through investments in management planning, ecosystem restoration, and infrastructure. It supports an ecosystem-based approach to the improved management of the area controlled by 14 leskhozoes in seven districts. Target areas are forested lands, pasture, and unproductive or marginal lands. Support is given to institutional reforms and capacity building, and to the introduction of integrated natural resource management planning at the leskhoz level.
82. *Conservation of Globally Important Biodiversity and Associated Land and Forest Resources of Western Tian Shan Forest Mountain Ecosystems to Support Sustainable Livelihoods* is GEF-UNDP Project with USD 28.6 million for 2017-2021. Toktogul and Toguz-Toro districts. Project's focus is on a landscape conservation and management approach in and around Key Biodiversity Areas (KBA). It promotes a better understanding on conservation of biodiversity and sustainable use of forest and land resources in buffer zones, corridors and sustainable forest and pasture management through a landscape approach. There are three components: (i) conservation and sustainable management of Key Biodiversity Areas within landscapes supporting the national protected areas network and vulnerable species habitats, and avoiding loss of High Conservation Value Forests (HCVF) through official recognition; (ii) enhanced ecosystem resilience and habitat connectivity in Western Tian Shan by regulating land and forest use in buffer zones and corridors and supporting sustainable livelihoods; (iii) strengthened national capacities for snow leopard conservation, promoting Kyrgyz regional and global cooperation and up-scaling.

Lessons Learned

83. The following key lessons were taken from previous project experiences:
- Supporting Government efforts to reform forestry legislation to allow the sustainable use of timber resources as well as reflect the regulatory needs of present circumstances; reconsider decoupling the regulatory functions; control and monitoring functions from economic functions.
 - SAEPF should develop appropriate regulations which is needed, based on current challenges (for example: there is no appropriate regulation on grazing on SFF territory, although grazing

is the main reason of failure of afforestation).

- Improve transparency of forest sector, and use multi-stakeholder and multi-sector approach.
- Strengthen the institutional base for SLM/SFM knowledge management and share SLM/SFM knowledge locally to specialised farmer groups.
- Implementing integrated forest management approaches to planning helps to achieve more sustainable forest management.
- Involving local communities and private sector in forest management will bring positive long-term impacts on forest protection and reforestation/afforestation.
- Introduction of long-term land leasing will provide a sense of ownership to tenants, which will help to improve forest conditions (5+45 yr. leases are much shorter than timber production rotations; 80-120 yrs.).
- There is a need to increase community/local government participation in management planning through support to the development of public-private partnerships (PPP).
- There is a need to increase access to private sector capital to increase investments in the sector through PPP, and generating sustainable economic growth. Corporate Social Responsibility (CSR) investments of larger companies will be a development option in the future, if such companies can be identified and engaged.
- There is a need to stimulate investments in the up-scaling and replication of good SLM/SFM practices that could involve development of micro-finance schemes and better integration of mountain farmers in regional and global environmental markets. Examples include the carbon market, certification for environmentally sustainable or organic production, and payments for ecosystem services.
- Micro-finance schemes may be used, as part of the blended finance component of the Project, to support e.g. the initial investments for establishing community tree nurseries (shades, tables, greenhouses, irrigation), improved equipment and supplies for tree planting irrigation systems, fencing/protection and fertilizing, and access to new locally adjusted technologies in downstream forest management activities (e.g. weeding, thinning, field transports, etc.), improved forest health supervision through drones, etc.

General Context of Forests in the Kyrgyz Republic

84. The Kyrgyz Republic is a mountainous country with 90% of its area located at altitudes above 1,500 meters and a population of approximately six million people. Almost 65% of the total population live in villages in rural areas. The Kyrgyz economy is largely agricultural, with the agricultural sector contributing around 15% to the country's gross domestic product (GDP) in 2016. By comparison, the forestry sector contributes 0,05% of the GDP. Nevertheless, both sectors are highly important to rural livelihoods and play a critical role in protection of soil and water resources.
85. Kyrgyzstan is highly vulnerable to climate change. The trend of rising temperatures is expected to continue, with projected increases by mid-century reaching between 2°C (in the East) and 2.8°C (in the North) under the Representative Concentration Pathways (RCP) 4.5 scenario. Under RCP8.5, the temperature would rise by between 2.6°C (East) and 3.8°C (North). It is expected that summer temperatures will rise, while winters remain mostly unchanged. Precipitation changes will induce a significant reduction of surface water flows. This increases the heat stress in summer, which will pose severe negative impacts on the country's ecosystem, livelihoods and economy.
86. Total forest area of the Kyrgyz Republic is 1,116 million hectares, or 0.56% of the total area of the country. Information on forest area under SFF and Protected Areas is shown in Table 5, and main vegetation zones in Figure 2. They are based on the latest comprehensive National Forest Inventory carried out in 2008-2010 (published in 2011). 75% of the forests are grown on State Forest Fund (SFF), and 25% on Protected Areas (PAs) under SFF. Planning and implementation of pasture and

forest plans is undertaken separately under different regulatory frameworks and institutional responsibilities, hindering an ecosystem-based approach which would have a higher mitigation and adaptation impacts.

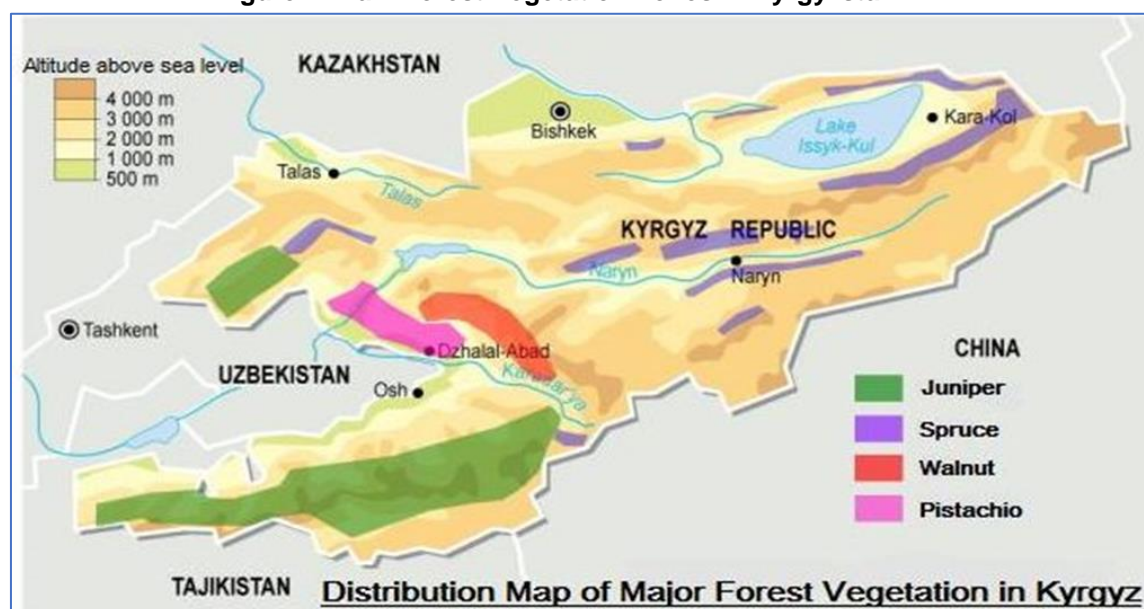
87. Other forests cover around 275,000 ha, and are located in the areas of Aiyl Aimaks (village communities / councils) and in land reserves. These forests mostly degraded because the issue on the rights of their operational management has not yet been resolved. These "municipal" forests have not been properly assessed or mapped, and the local government bodies have not been able to manage and protect from over-grazing and harvesting pressure by the local communities.

Table 5. Forest Area under State Forest Fund and Protected Areas in Kyrgyzstan

Administrative area	Total area covered by forests		By type			
	1 000 ha	%	Forests inside SFF and PA		Forests outside SFF and PA	
			1 000 ha	%	1 000 ha	%
Batken oblast	166.5	0.83	138.77	0.69	27.73	0.14
Osh oblast	186.31	0.93	110.55	0.55	75.76	0.38
Jalal-Abad oblast	380.25	1.9	324.8	1.62	55.45	0.28
Talas oblast	61.01	0.33	28.06	0.16	32.95	0.16
Chui oblast	44.53	0.22	30.96	0.15	13.57	0.07
Issyk-Kul oblast	142.36	0.71	102.8	0.51	39.56	0.2
Naryn oblast	135.6	0.68	103.62	0.52	31.98	0.16
Total	1,116.56	5.60	839.56	4.20	277.00	1.39

Source: Government Resolution dated July 26, 2011. №407

Figure 2. Main Forest Vegetation Zones in Kyrgyzstan



Source: Website of The Project for the Support for Joint Forest Management in the Kyrgyz Republic

88. Of this, around 269,000 ha (24%) are classified as indigenous forest; 57,000 ha (5%) are planted forest. The rest is pastures, unproductive lands and other lands (e.g. covered by lakes, rivers, etc.) Around 90% of the Kyrgyz forests are located at an altitude of 700 to 3,600 m above sea level. Kyrgyz forests consist of four main types: **(1)** spruce forests found in the eastern and central parts of the country and in the ranges north of the Fergana Valley; **(2)** walnut-fruit forests of global biodiversity significance since walnuts are indigenous and the area holds the largest walnut groves

worldwide, in the northern and northeastern slopes of the Fergana mountain ridge; **(3)** juniper forests growing under arid conditions and dispersed over the country; and **(4)** riverside forests. In addition, poplars have been planted near or within settled areas for timber production, for construction and as windbreaks.

89. The Kyrgyz Republic is one of the globally important gene pools of a huge variety of plants, containing around 4,500 species. Of these, 300 are rare or endangered, 125 species are endemic, and 200 species are considered medicinal plants.
90. There are about 180 tree species, representing arboreal and shrubby plants, that make up the forests of the Kyrgyz Republic. On the slopes of the Fergana and Chatkal ridges of the Tien Shan mountain system, natural walnut-fruit forests grow. This is the world's most important walnut forest area, occupied by a large variety of tree species such as walnut (*Juglans regia* L.), apple (*Malus spp.*), pear (*Pistus spp.*), pistachio (*Pistacia vera* L.)
91. All forests are owned by the state as part of the State Forest Fund (SFF), which comprises forest lands and lands not covered by forest but earmarked for forestry needs (e.g. mountain grasslands). In accordance with the Forest Code, all the forests of the country are considered to be precious natural resources, exercising environmental, ecological, sanitary, curative and other protective functions.

Land-use Challenge between Forestry and Pastures

92. Forests will ultimately compete with alternative land use options and economic considerations. Forest area conservation, forest production purposes, and enrichment will only be achieved if both the costs and the benefits of forests are shared in an equitable manner that promotes environmental quality and long-term economic and ecological sustainability. This will require a combination of approaches, including measures to alleviate poverty and secure livelihoods, as well as to promote national level efforts to balance forest management objectives (i.e., identifying trade-offs between different interests that optimize the social benefit from the national forest estate as a whole). Absent any profit or market incentives, there is little evidence that the wood users are willing to pay the full cost of managing forests in a sustainable manner. Small non-profit incentives for local people are not enough to bear the full cost of conservation by forgoing land and resource use options.
93. Natural pastures cover 9,2 million hectares (ha), or almost 87,2% of the agricultural land area in Kyrgyzstan. This includes pastures of the State Land Fund - SLF (76% or 7.9 million hectares) and those of the State Forest Fund - SFF (14% or 1.2 million hectares).
94. According to the value chain study on walnut (PROFOR, RDF, 2011) and Forest Management and Use in Kyrgyz Republic: Development Potential (Undeland, 2011):
 - 109,372 households (546,862 pers.) live in (or near) the spruce forests, which are mainly located in the north-western and central parts of the country, as well as in the mountainous areas of the Fergana Valley.
 - 255,816 households (1,279,081 people) live in (or near) the walnut-fruit forests in the south.
 - 109,372 households (546,862 pers.) live in (or near) juniper forests in different parts of the country.
 - More than 30,000 households (about 150,000 people) live in the floodplain forests.

(Source: Walnut value chain study findings, PROFOR-Programme on Forests and RDF-Rural Development Fund, 2011. Funded by World Bank.)

95. Primary sources of income of the population in the Kyrgyz Republic living in forests or near them are: livestock and forest products (37%), agriculture (20%), state wages and pensions (15%). The economic situation of about 80% of study respondents in communities near forests depends on forest resources in one way or another.
96. Pasture management planning is organized along two main frameworks:
- In the State Land Fund (SLF), the Law on Pastures (2009) set out the creation of Pasture Committees (PCs) to delegate rights and responsibilities for pasture management to local communities, and thus create incentives for sustainable use of pastures. Pasture committees are responsible for collecting a user fee, developing and implementing a management plan, which enables sustainable use of pasture resources
 - In the State Forest Fund (SFF), grazing lands account for 34% of the total SFF area, and are managed by forestry enterprises (*leskhoz*s) (PROFOR: Forest Management and Use in the Kyrgyz Republic: Development Potential, 2011). Farmers and herders living inside and outside the land of the State Forestry Fund are the main users of these grazing areas. In the SFF no mechanisms have been fully developed to date for grazing management. The Forest and Hunting Inventory Department of SAEPP which develops management plans for the FMU (Forest Management Units) neither monitors SFF grazing lands, nor plans their management. The right to graze on the SFF land is given to shepherds through a seasonal ticket for the summer.
97. Following the logic of these differentiated planning frameworks, the management plans developed by pasture committees are confined to spring, autumn and winter pasture management. Their members spend the summer season of the year in the SFF area without a pasture management plan. The full annual pasture management cycle and its enforcement is missing. This poses the greatest risk for forests in Kyrgyzstan.
98. In the SFF grazing lands, the maximum pasture carrying capacity is set by law, and expressed in livestock units (LU) allowed per area (ha). However, due to the absence of real management planning, pasture monitoring, and weak enforcement, the grazing norm is often exceeded (by up to 2.5 times in some areas)¹. According to CAMP-Alatoo's (NGO) unpublished information from Bazar-Korgon rayon, in Kyzyl Unkur leskhoz there are around 5,610 LU of local households, and 18,779 LU of AAs (*ayil aimags*), making in total 24,389 LU. Total pasture area of the leskhoz is around 17,000 ha, so there is a pressure to pastures of 1,4 LU/ha, which exceeds the carrying capacity by 40%.
99. Over-grazing changes the plant composition of degraded pastures towards more unpalatable species, increases soil erosion and destroys new planted forests. As pasture resources are dwarfed by the ballooning herd sizes, livestock roams into forests and feeds on young trees, coppice, forest plants and shrubs. It follows from this that Kyrgyzstan undergoes an accelerating, unintended mechanism of forest degradation and land conversion from forests into open pastures, shrubs and wastelands.
100. In certain Project regions like Jalal-Abad oblast, villages are located within or in the vicinity of forest areas. Inhabitants of these villages have a large number of livestock but they lack pasture resource. This is specific to Jalal-Abad oblast: most of the summer pastures are located on SFF land, so PCs use these lands for summer pastures. Apart from summer months when animals graze on mountain

¹ This is based on informal knowledge from the field, which is showing discrepancies in leskhoz's reporting. The leskhoz's are obliged to control grazing area and number of livestock on SFF territory, keeping it below one livestock unit per ha (1 LU = 1 bovine). As this is not the case, it is obvious why they under-report.

pastures, livestock spends the rest of the year in the forest, what disturbs severely forest regeneration.

Public Private Partnerships in Forestry

101. Public Private Partnerships have been increasingly used in various countries to stimulate the forest sector in adverse conditions where state-led forestry has led into a resource depletion. PPP is particularly useful in conditions where the public forest administration is failing to provide for good stewardship of forests and not maintaining a sustainable level of forest cover, reforestation targets, and standards of forest management.
102. The power of PPPs rests in the ability of the private partners to deliver solutions and services at a higher efficiency than the public sector, what leads into a more optimal allocation of the nation's resources and to a greater public good (e.g. environmental and water stewardship and climate benefits). Both public and private parties can contribute with experiences and methods that result in a combination of strengths and a market-driven approach.
103. PPP establishes a long-term relationship between public and private sector entities, what makes it a potentially useful tool in forestry, where economic maturity of investments is typically long. It is based on agreement to deliver an output (e.g. performance in afforestation/reforestation) cost-effectively and with a higher rate of success than the public sector can demonstrate. It allocates risk on the basis of who does what best, and the private sector partner will be selected in a competition (tender) to get the best value.
104. Payments in PPPs are based on agreed performance standards and delivery milestones, and not upfront. The Project can bridge the initial risk and provide grant or loan financing for investments to kick-start the new PPPs into operation, but the ultimate revenue and whole lifecycle costing and delivery will be under the responsibility of partners. Accountability is assured through audits of performance, which have to follow the principles of transparency, measurable objectives and effectiveness.
105. PPP is a new development assistance model to engage private companies, organizations, and foundations interested in supporting new and emerging 'green' markets, which have become a hallmark of environmentally and socially responsible enterprise development. For Kyrgyzstan the main opportunity is not with commercial timber (which is mostly slow-growth and not competitive in international markets), but more on valuable non-wood products such as fruits, herbs and nuts from its naturally rich forest ecosystems. Key pre-requisites of forestry PPPs are given in Table 6.

Table 6. Pre-requisites of a Successful PPP Project / Programme in Forestry

Requirements / Expectations by:		
Public Sector Partners	Private Sector Partners	Financiers (Project)
Enabling legislation (inc. on land tenure and taxes)	Clear legal and regulatory structure	Political commitment (stability)
Adherence with forest policy	One-counter service	Technical ability of partners
Shared expertise and capacity-building	Right to harvest wood / non-wood products	Rigorous financial analysis
Focus on performance improvement from business-as-usual	Reward for risk mitigation	Conservative cost-revenue assumptions
Standard contracts for simplicity of scaling up	Growth potential & market off-take	Certainty of state co-financing
Regular performance review & feedback for improved service level and efficiency gains	Fair profit level	Ability to leverage new financing
Trigger impact on achieving public good (climate, environmental services, biodiversity, carbon)	Product value chain support (inc. environmental services)	Scale of multi-criteria impacts

106. In some types of PPPs, the government uses tax revenue to provide capital for investment, with operations run jointly with the private sector or under contract. In other types (notably the Private Finance Initiative), capital investment is made by the private sector on the strength of a contract with the government to provide agreed services. Government contributions to a PPP may also be in kind (notably the transfer of existing assets).

107. PPP can be focused on either transferring the right to forest ownership, forest use, forest management, or establishing a company-community partnership. Private ownership is excluded from the provisions of Kyrgyz law and policy on forests. On forest use, lease agreements entail the individual/firm acquiring land without affecting the land title. During the lease period, private operators act as owners and are bound by the conditions of the lease agreement. In volume permits or standing timber sales the state sells standing timber in a specifically marked area, which is then logged by the timber company. Finally, the public forest authority may out-source logging activity from a professional logging company, while it retains the marketing and retail functions.

108. In Kyrgyzstan, the devolution of forest resource management tasks such as silviculture, reforestation and monitoring to PPPs are up for a discussion. While the Government of Kyrgyzstan is promoting PPPs, the SAEPP departments of inventories and planning are not open for a short transition to PPPs. Company-community partnerships is likely involve also the public sector (under their discretion).

109. In Kyrgyzstan's forest sector PPPs should be deployed e.g. in introducing innovative nursery growing techniques, new planting systems of seedlings on degraded and marginal lands, a community-based private forest enterprise model, in better monitoring and tending of planted forests, in marketing assistance of wood and non-wood forest products, and in logistical solutions to distribute seedlings with a lower cost to remote planting areas.

110. Some other local forms of forest collaboration may have proximate likeness to PPP, namely Joint Forest Management for forest restoration (See Text Box 1), direct Community Partnerships (out-grower schemes, purchase agreements) and Corporate Social Responsibility (CSR) schemes.

Text Box 1. Public Private Partnership in Balykchy *leskhoz*

In Balykchy *leskhoz*, a partnership between *leskhoz*, community, local government and private entrepreneurs is based on leasing low-productive *leskhoz* lands to private tenants. Leasing is based on competitive auctions announced in the community, and land plots are provided for rent after careful evaluation of applications and their description of land use purposes, protection activities and proposed rehabilitation work. The evaluation of the applications is made by an established Steering Committee, consisting of representatives of different local institutions and users. *Leskhoz* supports private tenants with consultations, and provides land plots with irrigation through donor funding.

Balykchy *leskhoz* also leases forestland based on a Collaborative Management of Forest (CFM) approach, mostly for purposes of wood production. 70 percent of wood will be owned by users, and the remaining 30 percent by *leskhoz*. *Leskhoz* already has 40 ha of lands with fast-growing trees and around 1,000 people are involved in the Collaborative Forest Management scheme. In addition to planting fruit trees, which comprise 70 percent of all leases, renting forest lands in Balykchy *leskhoz* for recreation services is of interest to local people, since the price for leasing forest plots for recreation services is much higher than for planting trees. During the last year *leskhoz* collected 4 million KGS from renting land, and 30-40 percent from providing services.

Source: Evidence-Based Strengthening of the NRM Governance - Sector Assessment and Recommendations for the CS-FOR Project (A. Undeland and A. Achilova)

111. Work undertaken by the FAO Forestry Department indicates that an important constraint to further advance sustainable forest production is the market failure that prevents a correct valuation of forests. Legal and sustainable forest ecosystem services, non-wood forest products and wood-based products are not fully appreciated for their climate and livelihood benefits. Co-existence of sustainable and illegal/unsustainable practices creates a cost difference, which together with technological backwardness of wood and non-wood product processing distorts markets and leads to poorly remunerative value chains. These factors contribute to under-investment in maintaining forest cover and productivity. In the context of Kyrgyzstan, the illegal timber also by-passes the collection of taxes and fees, and lowers the funding base of the *leskhoz*es to perform their sustainable forestry functions.

112. Walnuts, pistachios, almonds and fruits are the most valuable edible non-wood forest products in Kyrgyzstan. The fees for tenants who are collecting walnut, pistachio and almond is determined depending on the type of forest in the leased area, their average yield and forest growing conditions.

Core Project Area

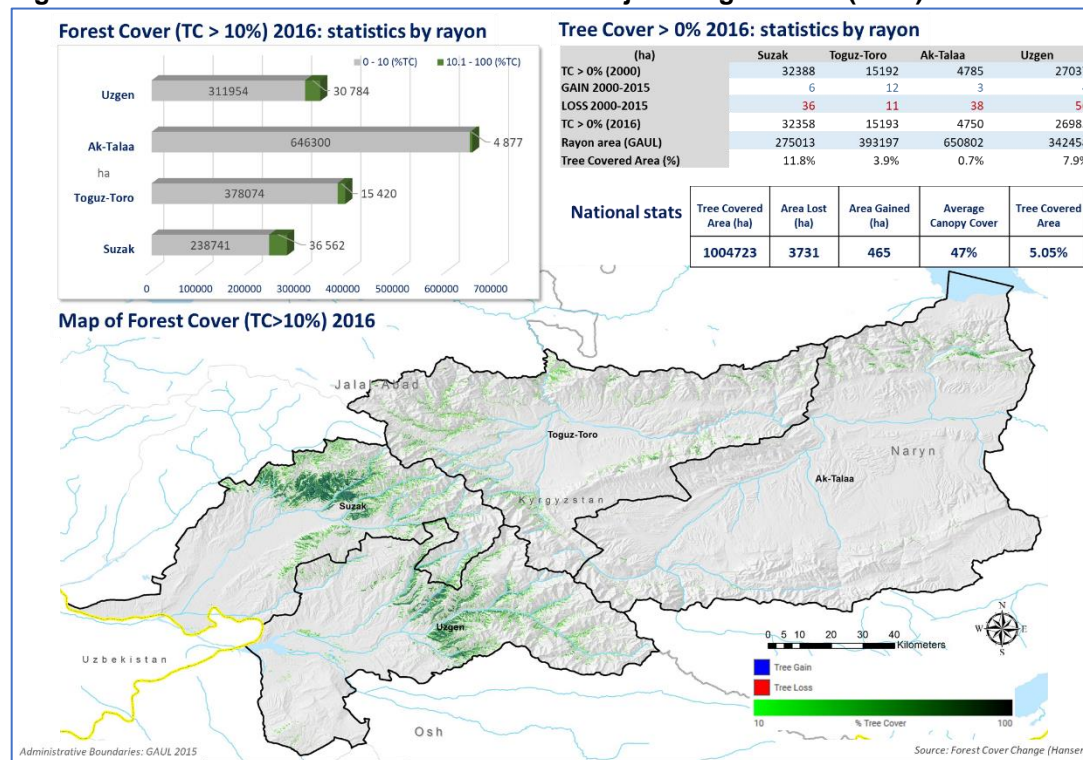
113. Unfortunately the latest available forest inventory data in the Kyrgyz Republic is often outdated, but that will not much undermine the credibility of basic analyses on core target areas presented below. We use maps extracted and modified by FAO, from renowned international organizations and the academia.

114. The pilot project area includes two districts of Jalal-Abad oblast: Suzak and Toguz-Toro, Uzgen district of Osh oblast and Ak-Talaa district of Naryn oblast. The forest cover maps of the four core areas are presented in Figure 3 below, based on original maps created by Hansen (Global Forest Change 2000-2016), as presented in this Project's Atlas. The map illustrates clearly the relative scarcity of Kyrgyzstan's forests. The country has only few areas where forests make up distinct domains. Tree cover area in percentage of total land area is the highest in Suzak (11.8%) and Uzgen (7.9%). In Toguz-Toro it is only 3.9% and in Ak-Talaa the lowest at 0.7%.

115. Tree cover is defined as all vegetation taller than 5 meters in height. The tree cover data set in Figure is a collaboration of the University of Maryland, Google, USGS, and NASA, and uses Landsat

satellite images to map tree cover globally for the years 2000 and 2010 at 30-meter resolution. Note that “tree cover” is the biophysical presence of trees and may take the form of natural forests or plantations existing over a range of canopy densities.

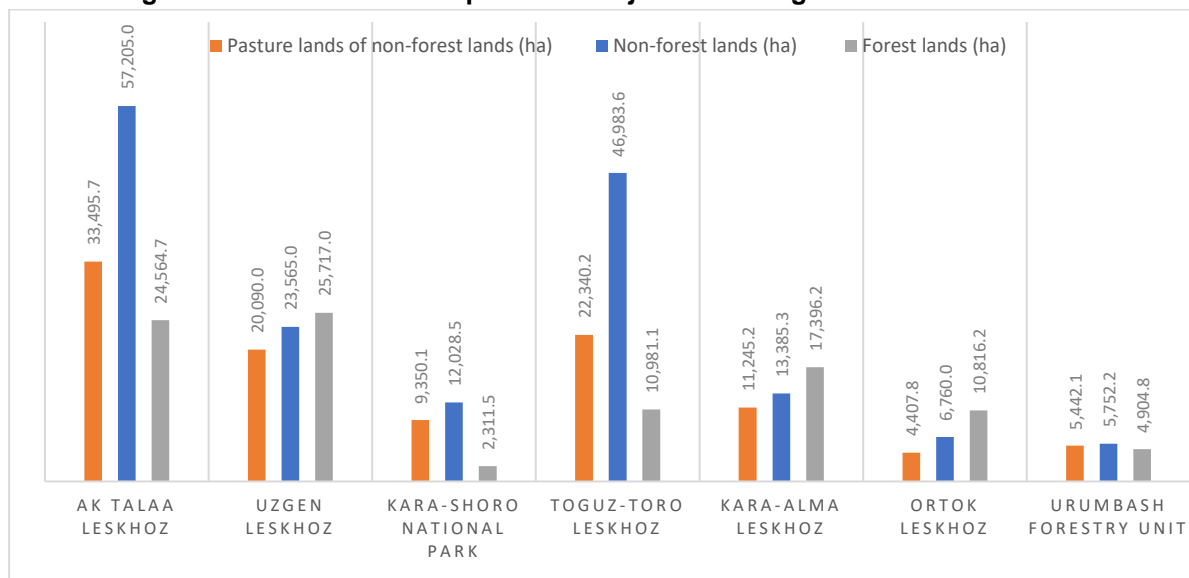
Figure 3. Forest Cover and Tree Cover in the Project Target Areas (2016)



Source Tree cover: Hansen/UMD/Google/USGS/NASA

116. There are five State Forest Enterprises, one Forestry Unit, and two National Natural Parks which make up the core target area. A brief description of the State Forest Enterprises is given below Figure 4 and in the text that follows.

Figure 4. State Forest Enterprises in Project Core Target Area: Land Classification



Source: Evidence-Based Strengthening of the NRM Governance - Sector Assessment and Recommendations for the CS-FOR Project (A. Undeland and A. Achilova)

117. The potential expansion area of the Project activities includes the four districts of Talas, Jail, Toktogul and Bakai Ata. Activities will be scaled up, and the best practices applied, in these areas after the initial 3-4 years of the Project implementation.

118. In the target area forest descriptions we refer to the post-planting conditions of young forests, which are mandatorily surveyed in the field by leskhoz. Forest planting quality is measured by the counted survival rate of seedlings. This rates are the following: (1) excellent: survival rate is more than 91%, (2) good: 71-90%, satisfactory: 36-70%, (3) unsatisfactory: 26-35% and (4) dead: less than 25%. Another forest quality measure is the density of canopy closeness: (1) dense forest has >80%, (2) open 50-80%, and (3) light 10-50%.

119. The changes in forest area have not been very significant over the past ten years, but the quality of forests has changed more. Also, a few more recent local forest inventories have been made in some regions by the Forest and Hunting Inventory Department of SAEPF (in 2011-2016), but their results have not been made public by SAEPF. This will be rectified during the year zero at the latest in consultations with SAEPF, FAO and NDA (National Designated Agency).

120. **Ak-Talaa Forestry Enterprise** is located in the Naryn and Jalal-Abad oblasts. The Forestry Enterprise is located on the outlying part of the Tien Shan mountain system. The Mountainous relief has a significant impact on the climatic conditions of the area. Depending on the relief and altitude, temperature and humidity, the amount of precipitation and other climatic factors are different. The main forest is spruce (*Picea tianschanica*), lower boundary of this forest is located at an altitude of 2,000 m above sea level. Along with spruce, other species of tree and shrub grow - birch, poplar, willow, and bushes (willow shrub, dog rose, sea buckthorn) in the lower zone. On the Alpine zone (3,200 m and more) there are juniper forest.

121. There are no settlements directly on the territory of the SFF, but mostly they are located in the vicinity of forest areas and take directly part in the anthropogenic impact on the environmental factors of the area. In total, there are 13 ayil aimaks (local self-government) in the Ak-Talaa district. The absence of industry and crops near the territory of the Forestry Enterprise makes livestock the main source of income for the local population. Livestock grazing is carried out practically throughout

the entire forest area. Stocking rate is high, which leads not only to destruction of the soil cover and erosion, but grazing is destroying forest plantations as well.

122. The total area of the Forestry Enterprise is **81,769.7** ha, including **24,564.7** ha of forest land, of which **18,880.4** ha is forest covered, and **5,684.3** ha not covered by forest (land that can potentially be covered by forest). Light forest area is 1,733.3 ha and clearings **3,895.6** ha. Non-forest lands occupy **57,205.0** ha, including **33,495.7** ha of pastures, **119.8** ha of arable land and **21,926.5** ha of other lands (rocks, stones, pebbles). True forest cover is 23.1% of the total area which is very small. Therefore, economic activity should be aimed at establishing and maintaining of stable plantations through reforestation. The main species of tree and shrub species in the Forestry Enterprise are: spruce (*Picea tianschanica* Rupr.), birch (*Betula turkestanica*), poplar (*Populus alba*), honeysuckle (*Lonicera* L.), rosehip (*R. cinnamomea* L.), currant (*Ribes* L.), Spiraea (*Spiraea* L.) and others.

123. According to the latest available forest inventory results (2006), **733.3** ha of forests were planted by the Forestry Enterprise, 60 ha of which were planted outside the SFF, and were under the responsibility of local municipalities. Monitoring has shown that only **86.6** ha (13%), out of 733.3 ha have a satisfactory condition; most are in unsatisfactory condition: **427.8** ha (64%), **138** ha (20%) were dead, **21.4** ha (3%) were not indentified, **0%** were in good condition. Thus, 84% of plantations are in unsatisfactory condition or dead, which leads us to the conclusion that investments in natural forest regeneration are not justified without solving the cause of this situation¹.

124. The main reasons for poor survival rates were (officially): drought - 47% of deaths; improper planting areas - 25%; disruption by livestock - 23.5%; and landslides -3%. It is not possible to figure out the real reasons of such condition without extensive fieldwork. The lack of plantation management leads to poor reforestation. The Forestry Enterprise does not grow coniferous species in nurseries. Planting material of coniferous species is purchased from the Issyk-Kul region, which affects the survival rate of plantations negatively, as long transportation (distance and time) lowers the overall condition of the planting material.

125. **Kara-Alma Forestry Enterprise** is located in the Suzak administrative district in between the high-mountain ranges of Sukhan-Tash and Ak-Tash. The vegetation type depends on the altitude and is divided into **5 vegetation zones**: **(1)** desert pistachio (*Pistacia vera*) light forest zone located on low foothills in a range from 700 to 900 m above sea level; **(2)** steppe pistachio light forest zone at an altitude from 900 to 1,100 (occasionally 1,300) m above sea level; **(3)** walnut-apple forest zone at an altitude of 1,100-1,300 m to 2,000-2,200 m above sea level. Walnut forests here are of natural origin, of different age and confined to northern exposures. Apple forests consist of apple trees *Malus kirghisorum* Al. and *Malus sieversii*. The upper edge (2,500-2,600 m. above sea level) of walnut-apple forests is formed by *Acer turkestanica* maple trees. **(4)** Subalpine shrub-meadow zone occupies heights of 2,000-2,500 m, in some places up to 3,000 m above sea level. Forest is represented mainly by light forest of *Acer turkestanica* and sometimes walnut forest and apple trees. **(5)** Alpine low-grass meadow zone is located at an altitude above 2,500 m above sea level and occupies mainly mountain tops, rocks and talus, devoid of vegetation. Woody vegetation is almost absent, shrubs are found in the form of individual specimens.

126. Kara-Alma Forestry Enterprise is located on the territory of Kara-Alma aiyl aimak (local self-government area), and has a **population** of 2,800 people. Forests are essential to the population for harvesting nuts, fruits and other types of natural resources. The Forestry Enterprise has significant amount of pastures as well. The total area of Kara-Alma Forestry Enterprise is **30,781.5** ha, of which forest covered area is **13,932.5** ha and pastures are **11,245.0** ha². Local community

¹ Project of Organization and Development of Aktalaa Forestry, Forest Inventory Department, Bishkek, 2007.

² Project of Organization and Development of Kara-Alma Forestry, Forest Inventory Department, Bishkek, 2005

relies mainly on these resources with grazing as the most important. Unregulated grazing of livestock commonly destroys the natural renewal of tree and shrub species. Livestock of the communities inside SFF lands graze in the forest area full year, starting in spring, from the moment of regrowth and maturation of grasses, and until the fall. In winter animals continue grazing inside the SFF territory because also villages are located there.

127. According to the materials of forest inventory in the Forestry Enterprise from 1991-2003 (the latest available data), **1,956.8** ha of forest that were planted, **699** ha or 36% were dead, **489.1** ha (25%) in bad condition, and **768.7** ha (39%) in a satisfactory condition. The main cause of death of forest plantations is grazing (70%); inconsistencies in conditions for forest plantations 12%; drought 10%; lack of care 7%; and poor-quality planting / seeding materials 1%.

128. Uzgen Forestry Enterprise is located on the territory of two districts - Uzgen and Suzak. Total area of the Forestry Enterprise as of January 1, 2002 was **49,187.4** ha, including **17,182.0** ha of forest area. The total area of non-closed canopy planted forest, light forest, standing snags, logged area and glades were **8,440.2** ha, and pastures **20,090.0** ha. The main economic activities of the local population are animal husbandry and crop production.

129. The main forest forming species of the forestry enterprise are: *Juglans regia* L. (walnut) -26%, *Acer* (maple) -22.2%, *Exochorda* (rose, 11.3%), *Crataegus* (hawthorn, 8.3%), *Malus* (apple, 4.5%), *Aflatus* = synonym of *Prunus triloba* Lindl. (flowering almond) - 4.4%, *Prunus dulcis* (almond, 3.1%), and other tree-shrub species. According to the forest inventory materials from 2003, only 23.9% of the plantings are "dense" (canopy cover 80-100%), 64.3% are "open" (50-80%) and 11.8% have a "light" canopy at 10-50%). The walnut and maple plantations have a "open" and "light" condition, respectively. This indicates that Uzgen forestry enterprise has a high need of carrying out work on enrichment planting¹.

130. During the period from 1992-2003, the forestry enterprise planted trees on 1,474.0 ha. The condition of these planted forest is relatively good: 28.4% are in good condition, 62.1% are satisfactory, and the remaining 9.5% of planted forest are dead. The main reasons for the death and unsatisfactory condition are: unsuitable site selection and grazing.

131. Toguz-Toro Forestry Enterprise is located mainly in the territory of Jalal-Abad oblast and its total area is **57,964.7** (according to inventory data in 2011). There are no settlements within territory of the forestry enterprise. However, in the immediate vicinity of the forestry enterprise there are 13 villages where more than 24,000 people live. Their main economic activities are livestock and agriculture.

132. Forests of Toguz-Toro forestry enterprise are characterized by a natural mosaic. Forest lands constitute **10,981.1** ha (18.9% of the total area of the forestry enterprise). Covered with forest area is **9,450.6** hectares (16.3%) and is mainly represented by species of natural origin. On so-called open areas light forest dominates, and these are inaccessible to economic activities. In non-forest areas, pastures and other lands (rocks, pebbles, steep slopes, etc.) prevail. The pasture area is 38.5% of the total area of forestry enterprise (**22,340.2** ha). The area of other lands (**23,357.1** ha) is 40.3% of the total area².

133. The main forest forming species on the forestry enterprise are: *Picea Schrenkiana* (Asian spruce), *Juniperus* (juniper), *Populus spp* (poplar), *Rosaceae spp.*, *Spiraea spp.*, *Lonicera spp.* and other

¹ Project of Organization and Development of Uzgen Forestry, Forest Inventory Department, Bishkek, 2003

² Project of Organization and Development of Toguz-Toro Forestry, Department of Environmental Monitoring and Forest Inventory, Bishkek, 2011

shrubby species. The forest with a dense closeness make up 19.7%, with free closeness 53.7%, and with a rare closeness 26.6% of the forest area.

134. From 1996 to 2007, the forestry enterprise planted 207 ha of new planted forest. Only 7 ha of the new planted forest is in good condition: 82.5 ha is satisfactory, 20 ha is unsatisfactory. The area of dead planted forest is 77.2 hectares. The main reason for the loss of planted forest is indicated as poor-quality planting material (26 ha).

135. Urum-Bash Forestry Enterprise is located in the territory of Karalma aiyl okrug of the Suzak district of the Jalal-Abad oblast. Forestry Enterprise was established on October 15, 1999 by the decision of the Government of the Kyrgyz Republic under No. 103P. The total area, according to forest inventory data in 2005, is **10,657.0** ha. There are four villages in the Karalma aiyl okrug: "Almurut" with a population of about 40 people, the village "Salkytor" with a population of about 60 people, the village of "Kyzyl Kyz" with a population of 90 people and Kara-alma with population around 2,400 people. The total area of forest lands is **4,904.8** ha, including **3,801.5** ha of forest. Pastures are on **5,442.1** ha¹.

136. Vegetation has a clearly expressed character of altitudinal zonality and includes five zones. **(1)** Zone of desert pistachio forests and small semi-shrubs occupy low and partly high foothills in the range from 700 to 900 m above sea level. Vegetation is represented by thickets of bush cherry, rare pistachio thickets (*Pistacia vera*) are encountered. **(2)** Zone of steppe pistachio forest of cereal meadows and steppes is confined to high foothills, located at an altitude of 900 to 1,100 m (occasionally 1,300 m) above sea level. Vegetation is diverse: in the lower part, there are thickets of pistachio, red-fruited cherry, hawthorn. In the upper and middle parts of the zone *Prunus*, *aflatunia*, barberry (*Berberis spp.*), cherry plum (*Prunus cerasifera*), and others species grow. **(3)** Walnut-apple forest zone lies at an altitude from 1,100-1,300 to 2,000-2,200 m above sea level. Woody vegetation of the forest zone is represented by walnut-apple forests. Walnut forests here are of seed-bearing origin, of different age and are confined to the slopes of northern exposures. Apple forests consist of apple trees of *Malus sieversii* and *Malus kirghisorum*. The top edge of walnut-apple forests is formed by maple trees, which rise to an altitude of 2,500-2,600 m. **(4)** The subalpine shrub-meadow zone occupies heights of 2,000-2,500 m, in places up to 3,000 m above sea level. The main components of this zone are rare maple trees from the *Acer turkestanica*, juniper, fir (*Abies spp.*), bushes and subalpine meadows. **(5)** The alpine low-grass meadow zone is located at an altitude of 2,500 m (or sometimes above). It occupies mainly mountain tops and rocks devoid of vegetation. The smaller part of the belt is occupied by alpine meadows. Woody vegetation is almost absent, shrubs are found in individual specimens from 800 to 3,000 m above sea level.

137. From 1991-2003, the Urum-Bash forestry enterprise created 304 ha of forest new forest, 89 ha of them are in good growth. Planting of walnut seedlings was carried out mainly under existing forest (400-450 seedlings per ha). The survival rate of new forest under forest canopy is too low, and their condition is mostly unsatisfactory or dead. The new forest planted in open areas survived better. In general, the growth is satisfactory or good on 137.5 ha out of 304 ha (45.2%), unsatisfactory on 45 ha (14.8%), and dead on 121.5 ha (40%). The main reasons for the loss of planted forest is grazing on 53 ha (43.6%), followed by a mismatch of planted trees with the geophysical and climatic conditions: on 47.5 ha (39%).

138. **Ortok Forestry Enterprise** located in Suzak Raion of Jalal-Abad province. The total area of forestry enterprise is **18,181.9** ha (2017). However, according to the Governmen Degree total area is larger at **19,263.8** ha. The difference is because Ortok Forestry Enterprise did not transform part of the land into forestry land, so the real area is the smaller figure. Total forest covered area is **11,216.8** ha, or 61.7% of total, and most of these are natural forests. Natural regeneration of the

¹ Project of Organization and Development of Urum-Bash Forestry, Forest Inventory Department, Bishkek, 2005

forest, according forest inventory data, is rated as “good” on **2,480.2** ha, **8,903.0** ha is bad, and on **4,302.4** ha there is no forest at all. These numbers are obviously poorly recorded, because their total sum (**15,685.6** ha), is more than the forest covered area.

139. From 2003 to 2013, **615.6** ha of the land were planted: 387.7 ha *Juglans regia* L. (walnut, 62.9%), 127.8 ha *Prunus* (plum, 20.8%), 42.4 ha *Malus* (apple, 6.9%), 14.5 ha *Gleditsia* spp. (honey locust, 2.3%) 22.2 ha *Acacia* (3.6%), 5 ha cherry (0.8%), 7 ha *Ulmus* (elm, 1.2%) and 9 ha apricot (1.5%). According to inventory result, only around 4.9% of planted forest is in good condition, 59.6% satisfactory, and 35.5% unsatisfactory condition or dead. The main cause of death of planted forest is grazing and lack of management. There are around **1,383.4** ha which potentially can be planted for new forest. However, for the next 10 years only **224.9** ha of new forest are planned for, and **1,158.5** ha of forests have to be rehabilitated. The 224.9 ha of planned new forest contains: 159.4 ha of walnut, 33.9 ha apple, 0.7 ha cherry, 28.9 ha apricot and 2 ha apricot¹.

140. **The National Natural of Park Saimaluu-Tash.** In order to improve the overall ecological situation in the Kyrgyz Republic, the preservation of unique natural areas of the Saimaluu-Tash SNP were organized to cover **32,007.2** hectares in Toguz-Toro district of Jalal-Abad region (Resolution of the Government of the Kyrgyz Republic No. 249 of May 25, 2001). On the territory of the Saimaluu-Tash SNP, at an altitude of 3,000-3,200 meters above sea level, one of the largest clusters of petroglyphs in Central Asia (more than 107,000 pieces) are carved into basalt slabs. This grand sanctuary of the ancient nomadic tribes of Saimaluu-Tash SNP is unique for the richness and variability in designs, from the ancient Bronze Age (3rd century - the beginning of the 1st millennium BC and to the 8th century AD).

141. The area of the protected area covers **9,221.8** ha (28.8% of the total area of the Natural Park), a recreational zone **4,540.9** ha (14.2%), and a natural regeneration zone **18,244.5** ha (57.0%). There are no settlements in the Natural Park, but there are settlements in the adjacent zone to the park where about 3,000 people live. The main economic activity is animal husbandry.

142. The forest lands of the Natural Park are recorded at **3,695.9** hectares (11.5% of area). Forest covered area is **3,314.6** ha (10.4%) with natural forest. Forest with full canopy density make up 762.1 ha, **1,339.8** hectares are open, and **1,212.7** hectares light. On natural areas not covered by forests, natural prehistoric sites predominates, and those are inaccessible to economic influence. Non-forest areas are dominated by pastures **15,236.6** hectares (47.6%) and other lands **11,769.4** hectares (36.8%) on rocks, pebbles, steep slopes, etc. The natural regeneration of the forest in the recreational zone is weak: only **11.8** hectares were in good condition, and **4,226.1** ha in a bad state.

143. Tree species represented mainly by: *Populus*, *Sorbus tianschanica* (rowan), *Juniperus* spp, *Acer* spp, *Salix alba* (white willow), *Crataegus sanguinea*, *Betula* spp. Main shrub species are: *Juniperus sabina*, *Lonicera*, *Rosa*, *Spiraea* and *Aflantunia ulmifolia*. Planted forest area defined by the Forest and Hunting Inventory Department is **1,152.3** ha, and **931.9** ha of them are located in the non-expropriated zone, which means that the problems associated with the availability of these sites need to be resolved. In the year of forest inventory (2011) 220 ha were considered in good condition. For the next 10 years, only 3.1 ha of land has to be planted each year².

144. **The National Natural of Park Kara-Shoro** is located in the south-eastern part of the Osh region on the territory of the Uzgen district. The total area of the Kara-Shoro NP is 14,340.2 ha and

¹ Project of Organization and Development of Ortok Forestry, The State Institute for Forest and Hunting Inventory, Bishkek, 2017

² Project of Organization and Development of The Saimaluu-Tash National Park, Department of Environmental Monitoring and Forest Inventory, Bishkek, 2011

it is divided into three zones: the strictly protected area - 2,090.9 ha, the regeneration zone - 11794.9 ha, and the recreational zone 454.4 ha.

145. The State National Nature Park "Kara-Shoro" was established in 1996 according to the Decree of the Government of the Kyrgyz Republic No. 353 of August 2, 1996 in order to preserve unique natural complexes and organize recreation for citizens of the Republic and foreign tourists.

146. The forest lands of the Natural Park cover 2,311.7 ha, of which actual forest covered area is 1,315.5 ha. Non-forest areas are presented by pastures 5,321.9 ha, and other lands 2,064 ha on rocks, pebbles, steep slopes, etc. The natural regeneration of the forest varies according to zones and on average the success is estimation weak, as only around 10% of forest covered areas have some regeneration (only 131.4 ha of forest have survived seedlings).

147. Tree species that are represented in Kara-Shoro NP are mainly *Picea schrenkiana*, *Juniperus spp*, *Juniperus sabina*, *Acer turcestanica*, *Malus niedzwefzkyana*, *Crategus sanguinea*, *Sorbus tianschanica*, *Lonicera mycrophylla*, *Cerasus austera*, *Betula turcestanica*. Planted forest area defined by the SAEPP Forest and Hunting Inventory Department is only 100 ha.

148. On the basis of the inventories the monitoring results of forest conditions, an estimate has been produced on the availability of lands in target areas, and presented in Table 8. At minimum, there are sufficient lands available both for afforestation/reforestation (12,501 ha) and for forest restoration (enrichment planting) - 25,069 ha.

149. Estimation of available land is based on the following land categorizations:

- For afforestation/reforestation (planted forests on barren, clear-cut or pasture land):
 - including Forestry Inventory Department's designated land for planting forests;
 - excluding dense (successful) forests already planted;
 - excluding areas planned for planting trees in the next 10 years (BAU);
 - including glades/trails without trees
- For forest restoration (defined as enrichment planting on degraded forests with some tree cover; and in accordance with the Russian language definition, including assistance to the natural regeneration of forests):
 - including only areas inside open and light forests (according to canopy class)
 - excluding lands defined unavailable according to zoning, and other unproductive land

Target Groups

150. In the Kyrgyz Republic, settlements are in many cases located close to forests, and more than 2 million of the rural population of registered in the 283 aiyl aimags (territorial entity) are in the forested areas (Table 7). Their socio-economic development is highly dependent on forest resources. 51 aiyl aimags are in the four districts where the Project is targeted at. The detailed tables containing the names of aiyl aimags per district/oblast and pasture hectares are in Annex 1. Details are given on Suzak, Toguz-Toro, Ak-Talaa and Uzgen districts, located in Jalal-Abad and Naryn oblasts.

Table 7. Aiyl aimags Located in Forest Areas

Administrative area	Total Aiyl Aimags*	including in forest areas	
		Aiyl Aimags**	%
Batken oblast	31	25	80.6
Jalal-Abad oblast	68	63	92.6
Issyk-Kul oblast	61	38	62.3
Naryn oblast	63	36	57.1
Osh oblast	88	53	60.2
Talas oblast	37	24	64.9
Chui oblast	105	44	41.9
Total	453	283	62.5

Sources: * Data from the National Statistics Committee, 2016; ** Department of cadastre data and registration of rights to immovable property GDS.

151. At the governmental level, direct beneficiaries of the Project are the Ministry of Agriculture, Food Industry and Melioration (MAFIM) and the State Agency for Environmental Protection and Forestry (SAEPF). The direct beneficiaries of the core project area are 65,000 citizens in the regions of Jalal-Abad, Osh and Naryn and over 100 staff from local and central administrations.

152. Indirect beneficiaries of the core project area are all those living downstream of the pilot districts, estimated at about 465,000 people. Also, a number of NGOs and service providers will be deployed in the implementation of afforestation¹/reforestation² and forest restoration³ activities, in accordance with Collaborative Forest Management⁴ and in the preparation of Integrated Natural Resource Management and Community Resilience Plans (INRMCRP).

153. The rural population, women and youth in particular, lack employment opportunities in the country. Unsustainable management of forest and land resources is also significantly exacerbating the situation. This process is resulting in increased internal and external labor migration. About one million workers, mainly men, are leaving their homes for permanent and seasonal work. They leave behind women, children, old and disabled people to tackle the daily works. This results in lower skill input and labor productivity per unit of production in agriculture and forestry, cropping, supply of fuelwood for heating and cooking, collecting non-wood forest products, etc. For many households, energy needs for heating and cooking are primarily met from biomass sources from a close range around settlements. This has resulted not only in local deforestation but also in loss of time, labor and health of the main resource users. (FAO and GEF. Sustainable management of mountainous forest and land resources under climate change conditions. 2012)

¹ Afforestation is the establishment of a forest or stand of trees (forestation) in an area where there was no previous tree cover.

² Reforestation is the natural or intentional regeneration of existing forests and woodlands that have been depleted, usually through deforestation caused by direct or indirect human activity.

³ Forest restoration means enrichment planting of a degraded natural forest under the existing canopy or vegetation. In Russian language the term also includes assistance to natural regeneration of forest.

⁴ Collaborative forest management (CFM) is a joint forest management approach between government and community.

154. The proposed project will have immediate socio-economic benefits to and impact on the well-being of vulnerable local people, particularly women, in project areas. The project will tackle the gender issue by promoting SFM/SLM based resource user associations (forest, pasture) in the project areas and respective national and local resource management institutions. By improving the provision of goods and services of forest and pasture ecosystems, the project will have significant implications for food production, rural development, productivity of sustainable economic activities, such as forest products, and economic costs of addressing environment-related natural disasters, such as landslides and flooding.

Table 8. Analysis on the Availability of Lands for Forestry Activities

Type/ area			Forestry Enterprise						National Parks		Total
Name of Target Area			Ortok	Urum-Bash	Kara-Alma	Uzgen	Ak-Talaa	Toguz-Toro	Saimal. Tash	Kara-Shoro	
Forest inventory (year):			2017	2005	2005	2003	2007	2011	2011	2010	
Total area, ha			18,182	10,657	30,782	49,187	81,770	57,965	32,007	14,340.2	294,889.6
Forest Land, ha	1	Forest covered area	11,216.8	3,801.5	13,932.5	17,182.0	18,880.4	9,450.6	3,314.6	1,315.5	79,094
	2	Non closed canopy planted forest	55,6	39,0	88,6	1037,8	40,7	20,3	0	113.1	1,395
	3	Nurseries, Plantations	13,1	3,7	11,8	105,5	0,3	1,7	0	0	136
	4	Light Forest	549,8	737,6	2,026.5	3,826.3	1,733.3	1,316.2	363,5	849.2	11,402
	5	Standing Snags	0	0	0	102,8	14,4	17,5	0	0	135
	6	Logged Areas	0	0	0	15,1	0	0	0	0	15
	7	Glades (trails)	471,0	323,0	1373,1	3352,7	3895,6	174,8	17,8	33.9	9,642
Total Forest Land, ha			12,306	4,905	17,433	25,622	24,565	10,981	3,696	2,312	101,819.2
Non Forest Land, ha	8	Irrigated Land	12.4	0	0	86.6	110.2	17.7	0	6.3	233
	9	Rainfed Land	18.5	53.4	119.8	24.5	8.9	27.0	1.4	0	254
	10	Meadows	363.7	37.3	202.1	200.7	48.6	199.8	57.3	0	1,110
	11	Pasture	3,745.9	5,442.1	11,245.2	20,090.0	33,495.7	22,340.2	15,236.6	9,350.1	120,946
	12	Orchards	1.5	0	71.7	54.2	0	0	0	0	127
	13	Homestead	142.3	42.5	189.8	77.0	11.3	123.0	0.4	0	586
	14	Wetlands	2.1	0.3	0	12.2	91.4	61.2	0	0	167
	15	Roads	3.9	18.0	27.6	0	28.0	35.8	2.4	23.0	139
	16	Rivers	225.2	12.8	22.1	202.6	1,484.4	810.2	13.6	18.9	2,790
	17	Sands	0	0	0	9.2	0	0	0	0	9
	18	Glaciers	0	0	0	0	0	11.6	1,230.2	228.4	1,470
	19	Other unproductive	1,360.1	145,8	1,470.7	2,808.2	21,926.5	23,357.1	11,769.4	2,401.8	65,240
Total Non-Forest Land, ha			5,876	5,752	13,349	23,565	57,205	46,984	28,311	12,028.5	193,070.4
Land Fund for planted forest defined by Forestry Inventory Department			1,384.0	No data	No data	1,100.4	No data	1,625.7	220.4	n.a	4,331
Plan area of afforest./reforest. in next 10 years (from year of inventory)			224.9	119.7	565.1	600.0	405.3	281.1	61.8	100.0	2,358
Exploitation	Available		7,023.6	1,797.4	10,925.0	no data	2,675.3	3,166.6	177.0	128.1	25,893
	Available to planting		9,128.4	7,317.6	17,372.0	no data	44,961.0	22,527.7	7,785.1	3.3	109,095
	Not available		2,029.9	1,542.0	2,484.5	no data	34,133.0	32,270.4	24,045.1	1,184.1	97,689
Canopy	Dense - >80%		3,892.6	456.6	3,552.1	4,108.5	752.0	1,866.2	762.1	31.1	15,421
	Open - 50-80%		4,875.4	3,095.0	6,789.8	11,045.3	14,117.2	5,070.9	1,339.8	1,177.7	47,511
	Light - 10-50%		2,448.8	249.9	3,590.6	2,028.2	4,011.2	2,513.5	1,212.7	106.7	16,162
Conclusions on Project Pilot Areas											
Min. available area for planted forest (afforest./ reforestation)			1,384	941	2,835	500	5,238	1,345	159	100	12,501
Min. available area for forest restoration (enrichment plant.)			6,654	1,949	9,367		5,922			1,177.7	25,069

Detailed Description of Interventions

(Please note that this part on Component 1 has been largely moved to another Working Paper. The considerations on NRM governance are presented here from the forest sector perspective, and serve the purpose of information-sharing for interested readers).

Contributions to Component 1: Evidence-based strengthening of NRM governance

Objective 1.1 Design and implementation of effective inter-institutional coordination and cooperation mechanisms for achieving a conducive policy and regulatory system for integrated ecosystem-based natural resources management and community resilience planning (INRMCRP)

Baseline:

155. Kyrgyzstan's public sector contains a number of institutions with functions related to the management of forests, some of which are overlapping. In one way this is good, since it demonstrates the cross-sectoral nature of forest management. It can also be a problem when a forest-related decision taken in one institution can have an adverse effect on another office dealing with forests. The problem is often a structural one, as it is driven by the strongest economic agents for a particular landscape. Without a cross-sectoral consensus for a tangible intervention, this may result in a continuous cycle of deforestation and forest degradation due to a lack of incentives for sustainable management of forests, and keeping trees on farms and in critical frontiers. Forests are often considered as a free reserve for other land uses without proper recognition of their fundamental role in the maintenance of life-supporting ecosystem services, including climate regulation and water security.
156. There needs to be a change in the mindset on how the SAEPF, leskhoz, forest users, forest tenants and communities perceive the sustainable resource management imperative, and communicate its effectiveness on achieving resilience, Green Economy Strategy and sustainable development goals. Collaborative and integrated natural resource management planning approach is a new concept in Kyrgyzstan, and albeit is in general accepted, it is not yet implementable. There is a need to strengthen partnerships at all levels, and to build new alliances for mitigation and resilience on the evident future scenario of an accentuating climate change. Conflicting institutional demands on forests call for well-informed decision-making and proactive communication between the Ministries, civil society organizations, communities and specialized agencies.
157. The forest data has to be made openly accessible to leskhoz staff, forest users, pasture users and NGOs. There is very limited communication between leskhoz and the Forest and Hunting Inventory Department of SAEPF which develops forest management plans. Usually, leskhoz do not have access to their own area data collected by the inventory department. Project should support the creation of a common database and a portal where leskhoz, forest users, pasture users, private sector and NGOs could extract information for forest management planning, lease auctions and use. This will require decisions at the highest political level.
158. Coordination has to be improved between different natural resource users. So far, Kyrgyzstan does not have real Integrated Natural Resource Management plans in use. Plans of leskhoz and pasture committees are contradicting each other. One direct result of this is the low survival rate of newly planted forests. The better adoption and inter-institutional support to the Project's Integrated Natural Resource Management and Community Resilience Plans (INRMCRP) would be a major achievement.
159. At the local level, a new approach will be deployed by establishing Community Landscape Management Groups (CLMGs) with engagement of local government *ayil okmutu* (AO) and *ayil*

kenesh (AK), state forest enterprises, cooperatives, PUUs, relevant private sector enterprises and other key stakeholders, to plan Collaborative Forest Management, and out-sourcing activities to communities through contracting and Public-Private Partnerships.

Table 9. Project component 1, Sub-components, Outputs and Activities

Components and sub-components	Draft focus and brief (non-exhaustive) outputs / activities description
1. Evidence-based strengthening of NRM governance Results in brief: Through evidence-based and inclusive processes, relevant institutions jointly design integrated, participatory and adaptive NRM and climate resilience plans and monitor their execution.	
1.1. NR policy and legal framework reform	<p>Outputs:</p> <p>1.1.1 Two national forest and pastures stakeholders meetings held (year 1): the first one for information-sharing, discussion and organization (membership); the second one for task force(s): TOR, workplans, institutional setting</p> <p>1.1.2 Thematic task force(s) on (i) afforestation/reforestation, (ii) forest restoration, and (iii) forest management are set up, instructed and kick-started with GCF Project's operational support (biannually)</p> <p>1.1.3 Task force(s) make targeted inputs to give support and leverage to GCF Project implementation, improving linkages with the Green Growth Strategy, and help promoting the Project into new areas (every year)</p> <p>1.1.4 Forest policy and legal processes are strengthened for improved efficiency and governance</p> <p>Activities:</p> <p>1.1.1 Conduct national stakeholders meeting to set up a task force for each major Output area on forests and pastures</p> <p>1.1.2 Consultations to develop task force work plan and terms of reference</p> <p>1.1.3 Coordinate, conduct and report task force meetings</p> <p>1.1.4 Engage legal consultants to review legislations, policies and regulation</p>
1.2. Integrated ecosystem planning: evidence-based integrated national NR M&E system	<p>Outputs:</p> <p>1.2.1 Evidence-based integrated (forest and pastures) NRM and community resilience plans (INRMCRP) are prepared covering every participating <i>aiyl aimag</i> (in total 51, but neighbouring ones can be combined) with:</p> <ul style="list-style-type: none"> • a guideline and a INRMCRP template, • a training package on methodologies and terminology (for ToT), • Community Landscape Management Groups (CLMGs) preparation process, • multi-stakeholder engagement rules, • selection tool for disaster-prone areas and severely degraded forest and pasture ecosystem, • georeferencing IT module and manual, • implementation steps, technical assistance and organization (PPP), • incentives, investments, grants and financial management (linked with afforestation/reforestation, restoration of degraded forests, management plans under Project), • roles, responsibilities and retention plan of participants, • grievance, environmental and social safeguards, • approval process with self-governed local organizations, institutions, and the government (SAEPF, leskhoses), • monitoring, evaluation and reporting scheme and template. <p>Activities:</p> <p>1.2.1 Community Landscape Management Groups (CLMGs) at the level of watershed or other appropriate to area of forestry enterprise) to participate in development of the INRMCRP</p> <p>1.2.2 Run dedicated community sessions on the opportunities for match-making, negotiating, and assistance on agreement-making, to convince communities to participate in integrated land use planning of INRMCRP and PPP</p> <p>1.2.3 Arrange legal consultation, technical assistance and facilitation of PPP models to implement INRMCRPs in forestry and pastures through community-based partnership events (coordinated with self-governing organizations)</p>

<p>1.3. Improved skills and capacities in adoption of climate resilient and adaptive forest and pasture planning, management and use</p>	<p>Outputs:</p> <p>1.3.1,300 staff, farmer, local people are trained on ecosystem-based approaches of INRMCRPs, and the underlying institutional and community-district level capacity is developed to help 49 <i>aiyl aimags</i></p> <p>1.3.2 10 PPP partnerships per year are established under the principles of INRMCRPs, and implement forestry and pasture management activities which are georeferenced to facilitate reporting into NRM monitoring system</p> <p>1.3.3 INRMCRP approach and methodology is further scaled up in new Project areas in North and North-West of Kyrgyzstan (doubling outputs, i.e. number of INRMCRPs and 300 people more)</p> <p>1.3.4 Contracted NGOs and ToT instructors do facilitation of INRMCRPs in 20-30 locations/ combined <i>aiyl aimags</i></p> <p>Activities:</p> <p>1.3.1 Budgeting and planning of the details for an inclusive training programme provision to relevant stakeholders</p> <p>1.3.2. Provision of hands-on assistance on implementing PPPs.</p> <p>1.3.3 Training of key forestry officers in SAEPF and in target areas, NGOs, CSOs, local forest and pasture experts, PUUs, and community people (lead farmers, local champions) in conducting the planning and implementation process of evidence-based INRMCRP</p> <p>1.3.4 Provision of hands-on, field activity driven training on georeferencing, monitoring, evaluating and reporting the successes and challenges to the task force(s)</p>
<p>1.4. Establishment of an integrated system to monitoring NRM</p>	<p>Outputs:</p> <p>1.4.1 A new standard and open-source software for compiling and infeeding data on INRMCRP and PPP on forests and pastures</p> <p>1.4.2 Reporting and monitoring is based on untampered data and guarded through multi-stakeholder adoption of software based on georeferencing and GIS</p> <p>1.4.3 Quality and reliability of NRM reporting and monitoring is improved to international level</p> <p>Activities:</p> <p>1.4.1 Develop a new reporting standard on forest and pasture management, monitoring and reporting, by adopting the definitions and best practice by FAO</p> <p>1.4.2 Develop an open-source monitoring and reporting (M&R) software and mobile application on the platform of georeferencing and GIS tools of the Project</p> <p>1.4.3 Train forest and pasture users to key-in all annual/seasonal activities carried out, and observations on forestry and pasture management, into the M&R software</p> <p>1.4.4 Train stakeholders on the benefits of electronic, georeferenced and untampered system in NRM monitoring and reporting</p> <p>1.4.5. Agree with SAEPF and leskhozoes on the necessity of enrolling into a common platform and end outdated and unreliable reporting standards and systems</p> <p>1.4.6 Integrate results periodically into the data system of the relevant Ministries, Climate Finance Secretariat, State Design Institute of Land Management, National Statistical Committee, the Cadastre Department, and State Registration Service</p>

Contributions to Component 2: Green investments for forest and pasture rehabilitation

(Please note that this original description of Component 2 has been modified by Project Formulation Team Leader, and its content has been integrated for its most applicable parts into the GCF Full Project Proposal and Feasibility Study.)

Objective 2.1 Afforest/reforest 3,000 ha of mostly dry high-altitude forest lands which are deforested or severely degraded lands inside and outside existing SFF lands. Main purposes are carbon sequestration, timber production, environmental benefits and improved livelihoods of local communities.

Objective 2.2 Undertake forest restoration in 3,000 ha of degraded forests with substantive recovery potential through enrichment planting with indigenous tree seedlings which sequester carbon, improve the adaptation of forests and communities to climate change, and enrich biodiversity.

Baseline:

160. Reference sample areas have been identified for each type of intervention forest type. These are communicated in GPS coordinates and polygons, which are fed into the Project Atlas for geo-referencing and data layering. The reference areas are representative of a "fair average condition" of forest without Project intervention. They are used as a baseline sample for monitoring the Project's impacts over the next 8 years.

161. Reference samples are defined by adopting the borders of leskhozoes (shapefiles) on digital maps of Google Earth, and by selecting a polygon with GPS coordinates. The reference areas are at minimum 10 hectares of size. The Project Atlas is using these polygons for calculating the benchmarks for performance of forest activities in the Project. 11 data layers are available for monitoring the Projects impact on target areas *vis-a-vis* reference area development (without Project).

Description of Detailed Activities:

162. Areas of Project's forest interventions are allocated to the six leskhozoes and two national parks in accordance with land and forest availability, activities allowed by law (See Text Box 4 on Activities allowed by legislation in different zones in national parks, leskhozoes); and by assessment of the typology of altitude, climate and forest zones.

163. Tree species and varieties have been matched according to scientific knowledge from the Kyrgyz Forest Institute under the Academy of Science, and validated with SAEPF. Project supports only the planting of endemic or non-invasive domesticated tree species from the Central Asia region. The same rule applies both for afforestation/reforestation purposes (i.e. where mostly single-species forest is the target) and for mixed broadleaved (a mixed forest with several tree species), and also in forest restoration.

164. From the onset, it is envisaged that the Project's afforestation/reforestation (A/R) activities will support the idea of establishing "new generation" planted forests, i.e. climate resilient, multi-purpose forests with native (indigenous) trees, mixed with locally accepted, productive and non-invasive other species. In the case of fast-growing poplars and willows, the varieties to be used have been

domesticated to Kyrgyzstan more than 50 years ago from Russia, and do not pose an environmental, genetic or phytosanitary risk.

165. Local interest on planting these species in varied combinations was verified in fieldwork meetings with local communities and in consultations with leskhozoes. Both afforestation/reforestation target and forest restoration target amount to 3,000 hectares, the details of which are in Table 10 below. Walnut (1,000 ha), mixed broadleaved forests (770 ha, to be composed of fruit trees such as wild apple and apricot, cherry, plum, and poplar, elm, ash, etc.), and spruce (630 ha) will be the largest planted forests in afforestation/reforestation part of the work. In forest restoration areas, enrichment planting with spruce (1,400 ha) and walnut (1,160 ha) will occupy most of the target area of planting.

166. The Project's focus for A/R will be on growing marketable species for sustainable harvesting for timber (spruce, poplar) and fuelwood (mixed broadleaved trees), and NWFP (non-wood forest products such as fruits and nuts). This is to respond to the increasing demand for wood in rural households, construction, and to substitute over time for imported wood. Important complementary benefits to local livelihoods and nutrition will come from nuts and fruits, mainly walnuts, pistachios, wild apples and pears, but also cherries, and plums.

167. Afforestation/reforestation is most urgently needed on the failed/delayed reforestation sites and open grasslands of SFF, which have been totally deforested. The most feasible approach is to reforest patches of highlands/grassland between remnants of forest, and to extend forest margins. Secondly, private tree planting is supported on SLF low-productivity communal lands which are developed through long-term lease contracts from the ayil okmotus. Thirdly, Project supports the rehabilitation of spruce forests in two-three National Parks, and on their buffer zones.

168. The list of most preferable sub-species and varieties is presented below. In text and tables only common names are used.

A. Trees for single-species forests (endemic ones):

- Spruce: *Picea shrenkiana* and *Picea tianshanica* Rupr.
- Juniper: *Juniperus turkestanica* and *Juniperus semiglobosa*
- Poplar: *Populus alba* and *Populus nigra* (introduced at minimum 50 years ago)
- Walnut: *Juglans regia* L.
- Pistachio: *Pistacia vera* L.

B. Trees for mixed broadleaved forests:

B.1. Wild fruit trees (endemic ones):

- Wild apricot: *Armenica vulgaris*
- Wild apple: *Malus sieversii* and *Malus kirghisorum* (both threatened)
- Wild plum: *Prunus spp.*
- Wild cherry plum: *Prunus cerasifera*

B.2 Other broadleaved trees (introduced at minimum 50 years ago):

- Poplar: *Populus alba* and *Populus nigra*
- Maple: *Acer turkestanicum*
- Elm: *Ulmus parvifolia*
- Ash: *Fraxinus excelsior*
- Willow: *Salix alba*

Table 10. Allocation of areas and species for afforestation/reforestation and forest restoration (enrichment) in target areas (hectares)

Tree Species	State Forest Enterprise						National Park		Total
	Ortok	Urum-Bash	Kara-Alma	Uzgen	Ak-Talaa	Toguz-Toro	Saimaluu Tash	Kara - Shoro	
Afforestation / Reforestation									
Spruce					400	150	50	30	630
Juniper					70	70	40	40	220
Poplar	20	20	20	30	30	50		10	180
Walnut	500	100	100	300					1 000
Pistachio	50	50	50	50					200
Mixed forests	60	100	100	100	60	150	100	100	770
Total:	630	270	270	480	560	420	190	180	3 000
Forest Restoration / Enrichment Planting									
Spruce					400	400	300	300	1 400
Walnut	250	350	300	260					1 160
Mixed broad leave forests	50	70	70	50			100	100	440
Total:	300	420	370	310	400	400	400	400	3 000
Grand Total:	930	690	640	790	960	820	590	580	6 000

Investment model:

169. Project's forest investment model takes into account the altitude, dominant tree species, forest legal status, custodianship and the main partners as follows (Table 11). Three investment models can thus be identified:

1. Leskhoz investments in high altitude spruce and juniper forests
2. Collaborative forest management through long-term leasing of walnut and pistachio forests on SFF lands from leskhoz, as stipulated in Regulation No. 482
3. Individuals investing in tree-planting on municipal under-developed SLF lands, with a long-term leases tendered from ayil okmotu (poplar and mixed broadleaved trees)

170. In each case, the initial first year investment costs are calculated to include the following activities:

- preparation of soil (opening either planting plots or lines)
- cost of seeds (in direct sowing of pistachio)
- cost of seedlings (inc. fertilizer)
- labour: planting work, the loosening of soil, weeding and mulching
- contingency: 10% of labour cost.

171. The total investment outlay in the Project amounts to USD 2.76 million, divided between USD 2.01 million in afforestation/reforestation, and USD 0.75 million in forest restoration (Table 12). Thereafter, there will be the regular weeding, replanting and tending costs in years 2-5, which have been factored into the cost model and financial analysis.

Table 11. Investment Cases for Afforestation/reforestation and Forest Restoration (enrichment)

Tree Species	Altitude (m)	Type of Forests	Main Partners
Spruce	1800-2600	Single-species spruce reforestation & enrichment on leskhoz land and in National Parks	Leskhoz
Juniper	2300-2800	Single-species juniper reforestation & enrichment on leskhoz land	Leskhoz
Walnut	1400-2000	Single-species walnut reforestation & enrichment on leskhoz land, collaborative forest management through long-term leases	Individuals, a.o. members & leskhoz
Pistachio	500-1000	Single-species pistachio reforestation & enrichment on municipal and leskhoz land, collaborative forest management through long-term leases	Individuals, a.o. members & leskhoz
Poplar	500-2200	Single-species poplar planted forest on municipal & leskhoz land	Individual, a.o. members & leskhoz
Mixed broad leave forest	1000-2200	Mixed broadleaved fruit and timber trees on municipal unproductive land	Individual, a.o. members & leskhoz

172. The largest share of investments in both afforestation/reforestation and forest restoration is directed to the walnut forest districts of Suzak (Ortok and Urum-bash) and in Uzgen (Tables 12 and 13). This is mainly driven by forest land availability, local community interest in income generation, and higher population density. Walnut seedlings are also more expensive than e.g. spruce seedlings. It is expected that the walnut-rich areas will see the best opportunities and economic rewards in adopting the new Regulation No. 482 which allows leasing of SFF forest land to Ayil okmotus and private people (in five year renewable leases).

Table 12. Allocation of Investments in Afforestation/reforestation and Forest Restoration (enrichment) by District (USD)

Investment by Rayon			
Rayon	A/R	Enrichment	Total
Ak-Talaa	1 284 211	820 235	2 104 446
Toguz-Toro	1 295 419	1 286 302	2 581 722
Suzak	2 665 809	693 381	3 359 190
Uzgen	1 472 193	823 083	2 295 276
Total:	6 717 632	3 623 001	10 340 633

Table 13. Allocation of Investments in Afforestation/reforestation and Forest Restoration (enrichment) by Species and District (USD)

Tree Species	State Forest Enterprise						National Park		Total
	Ortok	Urum-Bash	Kara-Alma	Uzgen	Ak-Talaa	Toguz-Toro	Saimaluu Tash	Kara - Shoro	
Afforestation / Reforestation									
Spruce	0	0	0	0	895 029	335 636	111 879	67 127	1 409 671
Juniper	0	0	0	0	228 751	228 751	130 715	130 715	718 931
Poplar	48 006	48 006	48 006	72 009	72 009	120 015	0	24 003	432 055
Walnut	1 280 426	256 085	256 085	768 255	0	0	0	0	2 560 851
Pistachio	115 345	115 345	115 345	115 345	0	0	0	0	461 378
Mixed forests	88 422	147 370	147 370	147 370	88 422	221 054	147 370	147 370	1 134 746
Total:	1 532 198	566 805	566 805	1 102 979	1 284 211	905 456	389 963	369 215	6 717 632
Forest Restoration / Enrichment Planting									
Spruce	0	0	0	0	663 278	663 278	497 459	497 459	2 321 474
Walnut	205 955	247 146	240 281	247 146	0	0	0	0	940 527
Juniper	0	0	0	0	156 957	47 087	78 478	78 478	361 000
Total:	205 955	247 146	240 281	247 146	820 235	710 365	575 937	575 937	3 623 001
Grand Total:	1 738 153	813 951	807 086	1 350 124	2 104 446	1 615 822	965 900	945 152	10 340 633

Responsibilities:

173. The Project will support leskhozoes in collaboration with SAEPF to improve their planning process for afforestation/reforestation through the following steps:

- Identify planting sites through GIS and field surveys (inside and outside SFF lands)
- Deploy the new Regulation No. 482 which allows leasing of SFF forest land to Ayil okmotus and private people (in five year renewable leases)
- On Ayil aimag, communal lands: define unproductive lands, slopes and other natural formations such as riparian zones that define planting area
- Promote Public-Private Partnerships upon introduction of the new regulation on leasing and tree planting on so-called unproductive land
- Need for fencing and whose responsibility is to invest and maintain fences
- Suitable tree species and varieties (using only endemic and at minimum 20 years ago domesticated species)
- Plan number of seedlings required, and their procurement and transport (mainly from leskhoz nurseries, but fruit trees also from private ones)
- For pistachio and almonds, define the seeds requirement and supply for sowing directly to the ground
- Procure new technologies, terracing and local fertilizer production (mix of dung, crushed quartz of Toktogul rayon, soil) for planting trees on degraded, poor soils and on higher and rocky terrains (most activity will be on 10-50 degree slopes)
- Plan for necessary and feasible investments for irrigation

Capacity Building in Forestry:

174. The following capacity building efforts are proposed under the Project:

- Technical training on nursery techniques:
 - o Selection of the plot for establishment of nursery
 - o Planning of nursery operational scheme
 - o Perpetration of seeds/sticks
 - o Preparation of the seedling section and growing section ("schooling of seedlings")
 - o Norms and standards of seeds by species
 - o Watering techniques and standards
 - o Moving of seedlings from seedling sections to growing section
 - o Norms of digging up of seedling materials
 - o Transportation norms of seedlings
- Training on planting new forest (forest silviculture) and plantation management
 - o Selection of the plots
 - o Preparation of the soil, for different tree species and varieties
 - o Methods of planting
 - o Norms of planting different species
 - o Plantation management (weeding, replanting, maintenance, irrigation, thinning, etc.)
- Training on legislation
 - o Application of regulation #482
 - o Enforcement of CFM approach
 - o Application of Tax Code
 - o Leasing out land for grazing

175. Clearance of forests through logging and grazing, and for commercial agriculture and subsistence farming have been the primary causes for deforestation and degradation in Kyrgyzstan. Compounded with this, the largely unsatisfactory quality of afforestation and reforestation have rendered the national forest cover into a decline (verified through the Project Atlas, although some statistics suggest the opposite). The reproductive quality of timber forests and nuts-fruits producing forests is declining, and their survival is undermined to the level where the occurrence of some of the main commercial tree species has permanently changed. The poor success rates in establishing new planted forests and the lack of prospering community woodlots are other observed shortcomings in the sector.

176. Socio-economic situation will be duly considered when selecting target areas (Project's Household Survey process refers). For the public-private-community partnerships in afforestation / reforestation through collaborative forest management (CFM), pasturable lands that are accessible on lower plains and without permanent cultivation of crops and orchards (i.e. not arable), sustainable grazing or other economic development, will be prioritized. Any land use change from a higher value land class onto a lower value class needs a government permission. This effectively avoids conversion of arable land to forest.

177. The higher altitude areas which are not likely to be of interest in the future due to their remoteness, will be dependent on the action by the leskhozos and CFM for their afforestation/reforestation. Their relative infertility and barrenness will render them less competitive for other land uses, i.e. their opportunity costs are low. This is important for ensuring the full support of the communities which is vital for successful project implementation. Land use change from a lower value class to a higher value class (e.g. from barren land to forest) needs only a district level permission.

178. Project needs to address the knowledge and infrastructure gaps in facilitating seed collection, nursery capacities, and strengthen capacities in tree improvement programmes through scientific selection of climate-resilient indigenous and accepted, productive and non-invasive other trees. Production of salt and drought resistant tree and shrub species and mycorrhizal trees in the nurseries should be increased, as part of CC resilience measures.
179. Capacity building and enabling infrastructural improvements will need to be considered. SAEPF has indicated its willingness to offer / send its staff to refresher courses on related topics such as extension services related to silvicultural prescriptions, selective low-impact logging and establishment of community nurseries for scaling up afforestation/ reforestation; establishment of guidelines and model sites that demonstrate reforestation of degraded dry and montane forests.
180. A key tenet of SAEPF is to incentivize and encourage partnerships between communities and *leskhoz*es for joint forest resource replenishment and management. Increased awareness and participation of communities in planting trees through private sector managed out-grower schemes will be created, especially in strategic areas adjoining threatened natural forests of high biodiversity, ecosystem services or non-timber forest products value. This involves holding them fully accountable by stricter lease contract rules stipulating financial repercussions for violations. Contractual provisions would mark a significant move away from relying on poorly monitored and enforced terms of leases without any consequences of breach.
181. The forestry companies (*leskhoz*es) are for example tasked to assist with land preparation after logging a site to allow community members to swiftly replant the plots with native seedlings. On the other way around, communities can utilize their local knowledge to collect seeds, propagate seedlings and sell the seedling to forestry companies to fulfill the lease/logging license condition of replanting. The Project would pay landowners to plant the logged-over forest on market rate (at present communal rates are far lower). This would model a partnership between the SAEPF and *leskhoz*es (issuer of lease/logging license), community members, forestry company and state as the landowner.
182. SAEPF can regulate the logging and replanting to ensure policies and requirement of the code of logging practice are adhered with. The forestry company will only pay for the seedling and land preparation for reforest while landowners will be assisted by NGOs to identify and dedicate for protection superior “parent” trees to be propagated. Communities and *leskhoz*es will set up nurseries and deliver seedlings on a timely basis depending on the acreage under logging. Benefits from the sale of seedlings, planting and maintenance work of planted trees will be compensated in cash. Civil Society Organizations would fulfill their commitment to set up Conservation Management Plans on areas dedicated as Protected Area or Conservation Areas.
183. Involvement of the local community in planting of new forest will be done through the introduction of the Collaborative Forest Management (CFM) approach. This approach has been implemented since 2001 and this approach was originally proposed by the Kyrgyz-Swiss Forestry Sector Support Program in 1998. The main idea of CFM is management of forestry by the local community living in or near the forest area, as the permanently residing population depends on forest resources for fuel, forage and wood and non-wood forest products, and will have a strong interest in protecting and managing these resources.
184. Up until today, the development of CFM in the walnut forest areas in Kyrgyzstan has shown some positive initial results, but also local conflicts have emerged (as reported e.g. by Arslanbob area in Fergana). This underlines the challenge of sharing a high economic interest on annual crops that make a large contribution to the family income.

185. In addition to SFF forest and non-forest lands, there are some other potential lands with limited access and planting activity at the moment. Municipalities plant on limited access lands which belong to them, and which local people are not motivated to rent for their marginal nature. Very few walnut and pistachio plantations are created on SFF land.
186. Local government bodies (aiyl okmotu and aiyl kenesh) are responsible for management of municipal forests and pastures, but in many cases they delegate functions of pasture management to the PUUs and PCs.
187. Participation of the private sector in the creation of plantations will be implemented through the introduction of the private public partnership (PPP) principles and the project will support the implementation of PPP in the territory of the SFF through improvement of legislation. Measures will be supported to provide the irrigation system, fencing and other measures based on assessing the potential of forestry enterprises to implement PPP. This will help to create investment attractiveness of SFF for potential investors.
188. As for economic attractiveness, it is likely that planted forests with multi-purpose trees and agroforestry / agro-silvo-pastoral practices would be the most feasible targets for private sector involvement. Other than that, it is not realistic to expect private sector investment in the coniferous forest management and forest restoration outside the most high-value forest types.
189. It has been reported during the Project's preparations that long transportation distances and distant nursery locations cause pre-planting losses of seedlings. Some forestry enterprises (for example Ak-Talaa) purchase planting materials from other regions which may not be adapted to local conditions, and have a low survival rate. The setting up of local network of nurseries in the pilot areas is required.

Description of Detailed Activities: Afforestations/Reforestation

Summary:

190. By 2024, at least 6,000 hectares of severely degraded forest ecosystems are rehabilitated, expanded, diversified and managed by local stakeholders on the State Forest Fund (SFF) lands. Of the total target area, 3,000 ha will be afforested/reforested on open lands, and 10,000 ha will be subject to forest restoration through enrichment planting (under canopy) in degraded forests. The total outreach area considered under the integrated NRM and community climate resilience plans (INRMCRP) is estimated at 30,000 – 40,000 ha. Outside forests, the rest of the target area is mostly pastures, which will be brought under sustainable management plans. Minority of this land mass is forested, where any further deforestation will be avoided and degradation halted.
191. Majority of forests in pilot area have a low canopy density. It is necessary to develop protective measures to save these seedlings from cattle grazing. Experiences from e.g. the Bazar-Kogon district can be drawn, where individual seedlings are protected (cost is 3 USD/each), or through perimeter fencing. The restoration process will be implemented through the involvement of the local community on the principles of collaborative forest management (CFM). Forests with low density will be transferred to long-term lease, and tenants will be responsible for the safety of planted trees.

Table 14. Project component 2.1, Sub-components, Outputs and Activities

Components and sub-components	Draft focus and brief (non-exhaustive) outputs / activities description
2.1 Green investments for afforestation and reforestation and pastures Results in brief: Through investment funded by forestry grants (reforestation/afforestation) restoration of degraded forests and competitive grant schemes (public goods and productive investment for pasture restoration), the adaptive capacity of target population is increased and their exposure to climate risks is decreased.	
2.1 Green investment in afforestation/ reforestation	<p>Outputs:</p> <ul style="list-style-type: none"> 2.1.1 A geo-referencing system to tag and monitor all afforestation/reforestation activities 2.1.2 20 community teams/year trained and organized per year to work through PPP model 2.1.3 40 seed collection campaigns per year (two per community) 2.1.4 One new community nursery established / expanded in every participating community 2.1.5 A five-year A/R work plan at the community level, embedded in the INRMCRP, together with an economic and financial assessment tool 2.1.6 Assisted negotiations of 20 PPPs: next five years adjusted based on success and lessons learned 2.1.7 1,200 ha per year of A/R implemented (tbc in detailed design phase) 2.1.8 Each partnership is geo-referenced, monitored and reported to the task force and the media 2.1.9 New community-based fire management teams are set up 2.1.10 Kyrgyzstan's A/R code of practice is aligned with the criteria of forest certification and carbon market mechanisms <p>Activities:</p> <ul style="list-style-type: none"> 2.1.1 Map out forest plots for A/R in order of priority and immediate success potential 2.1.2 Organize and train communities into A/R task forces: apply Training-of-Trainers / Farmer Field Schools / Lead Farmer / Local Champion approach 2.1.3 Collect and purchase the required amounts of seeds of indigenous and other accepted tree species 2.1.4 Establish community and leskhozoes tree nurseries for growing seedlings of climate-resilient native & other accepted tree species 2.1.5 Prepare A/R work plans and tie them up with rural land use plans and farm activity calendars 2.1.6 Establish a logistical network and system for undertaking the planting of seedlings in the target areas 2.1.7 Contract local community crews to carry out the planting 2.1.8 Provide technical support, tools and equipment for land preparation and tree planting, weeding and tending 2.1.9 Scale up the A/R through partnerships (PPP) 2.1.10 Monitor progress in the planting and tending of young trees, survival rates, and replanting to replenish dead trees 2.1.11 Monitor social & ecological safeguards: stakeholder participation, risks and benefits; propose corrective measures per need 2.1.12 Calculate, monitor and report carbon sequestration resulting from A/R 2.1.13 Set up teams for collaborative fire management between communities (surveillance & first response), and district/province level and the private sector (fire management planning) 2.1.14 Develop an A/R code of practice as a policy and normative tool

Objective 2.2 Undertake forest restoration on 3,000 ha of degraded forests with substantive recovery potential through enrichment planting with indigenous tree seedlings which improve the adaptation of forests and communities to climate change, and enrich biodiversity.

Baseline:

192. The currently prevailing practices of reforestation/afforestation, agroforestry and the restoration of pasture and forest ecosystems have not been leading to the desired result. Overexploitation of forests is due to illegal felling and fuel-wood harvesting¹ and of pastures on both forest and municipal land is due to the unsustainable number of livestock heads, poor incentive schemes leading to inappropriate management practices, and insufficient capacity of the *leskhoz*es (state forest enterprises) to secure survival of planted species, control resources², and to effectively involve communities in the process. For example, some species (pistachio and almond) are eaten up by cattle, and some trampled (walnut). In this regard, there is an urgent need to revise the approach to management of natural resources as well as in shifting from an economy of pure exploitation - with high dependency from natural stocks and low level of climate resilience - to a greener one resulting from sound and sustainable management of available resources (natural, financial and human) supported by processes of productivity enhancement via increased quality and efficiency.
193. Logging licenses issue by the SAEPF have a condition calling for replanting and restoration of logged over forest but implementation has been in many cases negligible due to the high costs associated with seed propagation and seedling distribution to the relatively poorly forests. Terrains are mostly relatively steep and logistics and distribution of seeds and seedlings to communities close to degraded forests is a major cost item and needs to be carefully planned.
194. Priority areas for forest restoration with planting of native trees will be those with high conservation value, rich non-timber forest product potential, water and soil protection, or cultural importance. The other main restoration options are multi-purpose trees on farm woodlots and natural regeneration with assisted seed dispersion.
195. Conservation forest restoration, which means planting of native species purely for conservation purposes, will serve primarily as buffer zones, extensions to existing native forests, watersheds and key biodiversity areas. Enrichment planting with indigenous species does not require as many of the preparatory steps than afforestation/reforestation on grasslands or slopes. But careful planting of the seedlings, their protection from cattle, and associated weeding in the first years, are necessary for improving the survival rate. Planting density of seedlings per hectare will be less than half of that on A/R, but the final selection of degraded sites will determine how much planting density varies. Catchments around headwaters of major river systems, where the loss of forest cover has major implications on water security for the lower communities are important to restore.

¹ World Bank, 2015: Kyrgyz Republic, Communities Forests and Pastures.

² Forest resources and non-timber products are exploited largely through an informal or non-corporate channel, leaving neither records on the use of these resources, nor sustainability strategies.

Table 15. Project component 2.2, Sub-components, Outputs and Activities

Components and sub-components	Draft focus and brief (non-exhaustive) outputs / activities description
2.2 Green investments for forest restoration and pastures	
2.2.1 Green investment in restoration of degraded forests	<p>Outputs:</p> <p>2.2.1 A geo-referencing system to tag and monitor all forest restoration activities</p> <p>2.2.2 20 community teams/year trained and organized per year to work through PPP models</p> <p>2.2.3 40 seed collection campaigns per year (two per community)</p> <p>2.2.4 One new community nursery established / expanded in every participating community</p> <p>2.2.5 A five-year restoration work plan on community level, embedded in the INRMCRP, together with an economic and financial assessment tool</p> <p>2.2.6 Assisted negotiations of 20 PPPs: next five years adjusted based on success and lessons learned</p> <p>2.2.7 2,000 ha per year of forest restoration implemented (tbc in detailed design phase)</p> <p>2.2.8 Each partnership is geo-referenced, monitored and reported to the task force and the media</p> <p>2.2.9 Forest restoration code of practice aligned with criteria of forest certification and carbon market mechanisms</p> <p>Activities:</p> <p>2.2.1 Map out forest plots for restoration in order of priority and immediate success potential</p> <p>2.2.2 Organize local forest restoration teams in each target area (leskhozoes, PUUs, communities, PPPs)</p> <p>2.2.3 Prepare a programme of work and implementation strategy for forest restoration</p> <p>2.3.4 Teams carry out seed collection, distribution, planting seedlings (with Project training)</p> <p>2.3.5 PPPs/communities establish nurseries for growing the tree seedlings of selected species</p> <p>2.3.6 Establish a logistical network and system for undertaking the planting of seedlings in the target areas</p> <p>2.3.7 Contract local community crews to carry out the planting of trees and forest restoration</p> <p>2.3.8 Provide technical support, tools and equipment for land preparation and tree planting, weeding and tending</p> <p>2.3.9 Monitor progress in the planting and tending of young trees, survival rates, and replanting to replenish dead trees</p> <p>2.3.10 Monitor social & ecological safeguards: stakeholder participation, risks and benefits; propose corrective measures per need</p> <p>2.3.11 Calculate, monitor and report carbon sequestration resulting from the forest restoration</p> <p>2.3.12 Develop a forest restoration code of practice as a policy and normative tool</p>

Institutional Aspects and Implementation Arrangements

196.NDA is the newly established Climate Finance Secretariat. Executing Agency will be the FAO. SAEPPF will be a key implementing partner in those forest area-based activities that fall within its mandate and are aligned with its current Action Plan and capacities. Implementation will follow the established government procedures with the line ministries (mainly Ministry of Agriculture, Food Industry and Melioration (MAFIM) coordinating and providing the necessary technical and policy guidance.

197. The implementation will be coordinated by SAEPF with the participation of the Oblast Administration and Rayon Administration. SAEPF is the government institution responsible for the coordination of state programs on forest management. It will be the main implementing partner. Oblast Administrations are the sub-national political entities in Kyrgyzstan. SAEPF has divisions under each oblast representing them. Rayon is a second degree of administrative division below the oblast level. The following rayons together with local communities will be involved in the project implementing activities:

- (1) Uzgen rayon of Osh oblast;
- (2) Suzak rayon of Jalal-Abad oblast;
- (3) Toguz-Toro rayon of Jalal-Abad oblast;
- (4) Ak-Tala rayon of Naryn oblast.

198. A multi-sectoral Project Steering Committee (PSC) will be established, with the usual tasks of checking the Project's alignment with policy and Gov't strategic planning goals, technical and legal reviews, annual work plans and budget monitoring. Chair will be the Permanent Secretary (PS) of the Ministry of Economy and co-chair PS of the MAFIM. Other members of PSC will be selected among the Permanent Secretaries or high-rank planning department officials of the Ministries. Steering committee will meet quarterly to review progress of project implementation and perform other functions it will be mandated to undertake.

199. A Multi-Stakeholder Advisory Committee (MSAC) will be established to meet regularly with the PSC to provide views on the progress and status of overall Project implementation, as well as recommendations for improving performance.

Possible members from forestry to PSC and MSAC include:

- Director of SAEPF
- Deputy Director of SAEPF
- Heads of Province Departments of SAEPF
- Head of the Forestry Inventory Department
- Head of the Forestry Department of SAEPF
- Directors of pilot area Leskhozes
- Relevant NGOs
- Forest Users' Associations (FUUs), Pasture Users' Associations (PUUs)
- Forest Research Institute (under Institute of Biology, National Academy of Sciences)
- Institute for Forest and Walnut Research (under National Academy of Sciences)

200. Oblast, District, *Ayl okmotu* (AO, executive body at *ayil aimak* level) and SFE participation: each Oblast/District and SFE will designate relevant competent forestry officers to act as District Focal Points for implementation of the project activities. The staff will form a local Project Delivery Team (PDT) for coordinating, facilitating, or jointly implementing Project activities with service providers, contractors and community members of selection. PDT's main role is to technical supervision and local back-stopping to the Project, which is operated through the decentralized forest administrations, SFEs in oblasts and districts. Extension tasks will be shared with Forestry Officers, Agriculture and Pastures Officers, and Conservation Officers in some activities, e.g. those on Protected Areas. A large amount of farmer sensitization, capacity-building and technical assistance to contractors is foreseen in the field.

201. National Stakeholder Committee (NSC): to provide (i) advice on relevant policies, actions and measures in particular related to participation of local communities at the pilot sites in the selected oblasts and rayons; (ii) new ideas and thinking on conflict resolution over management of natural resources, (iii) options for increased carbon sequestration and sustainable use, and creative

initiatives on how to increase public awareness of socio-economic and global environmental benefits generated by SFM and SLM; and (iv) improve communications between the government agencies, local communities and the private sector. The composition of the NSC will include representatives from local leskhozoes, farming and herding communities, municipal and oblast governments, Water User Associations (WUA), Pasture Committees, and other parties involved in tree planting, agroforestry, pasture management and forest conservation. The National Stakeholder Committee will meet back-to-back with the PSC to provide consolidated advice on stakeholder participation and engagement.

202. Involvement of NGOs, Civil Society Organizations and the Private Sector. There will be an extensive deployment and sub-contracting of the private sector operators (contractors, companies, consultants, etc.) and community members and groups to implement the Project activities. NGOs and CSOs are already actively running projects on the ground, and have accumulated experience on approaching and mobilizing communities for forest development work. Project planning has so far identified a number of NGOs and CSOs working close to the Project target areas.

- Pasture User Unions “Kyrgyz Jaiyty” (AKJ);
- NGO Rural Development Fund (RDF)
- NGO Kyrgyz Association of Forest and Land Users
- NGO Agrolead
- NGO Rural Advisory Service Jalal-Abad
- NGO Lesik Jug
- NGO CAMP Alatoo
- Forest Research Institute (under Institute of Biology, National Academy of Sciences)
- Institute for Forest and Walnut Research (under National Academy of Sciences)

203. Their experience and skills will be tapped for an expedited learning curve. It is expected that the Project detailed planning phase will identify new actors, whose capacities, quality of services, and self-governance will be evaluated. Their charters and records will be evaluated as part of the due diligence. A pool of such expertise and their frequent delivery ratings will be institutionalized into a Roster of Project Implementation Partners.

Expected Benefits

- 3,000 ha of new planted forests are created on open lands (afforestation/reforestation);
- 3,000 ha low tree density forests are restored (under canopy enrichment planting);
- 30,000 – 40,000 ha of forested lands falling under the 480,000 ha pasture land component of the Project will be brought under sustainable management plans, and their further deforestation avoided and degradation halted (this needs to be verified and decided);
- Mechanisms of involving of local community into forest management are developed, tested and scaled up;
- Local investments into forest plantations are stimulated and PPP approach on SFF land implemented;
- Local community's income is stable or increased.

204. Regarding the carbon benefits, the main contributions will come from the improved pasture management, which affects the largest block of land in the target areas. Planned forestry lands are a smaller portion of the total, and still partly undefined for final type of intervention. The detailed classification of the total land area (530,000 ha) between pastures and forests in land use will have to be achieved for a more definitive carbon assessment, keeping in mind that changes in land use classes need formal permission, are reflected in cadastre, and are regulated by either the government or the local district administration. Tentative calculation of the carbon sequestration

from afforestation/reforestation of 6,000 ha yields 2,106 million tons CO₂ eq in the 8 years implementation phase and 12 years capitalisation phase. In forest restoration activity, from 10,000 ha the carbon sequestration will be 0,632 million tons CO₂ eq for the same time periods.

Risks and Mitigation

205. Project risks have been identified and analyzed during the full project preparation and mitigation measures have been incorporated in the project design (Table 16).

Table 16. Risk Assessment

#	Risks	Mitigation Measures
1	SAEPF is not interested in transferring functions on afforestation/reforestation and forest restoration to local communities (CFM) and the private sector (PPP)	<ul style="list-style-type: none"> - Active involvement of SAEPP in legislation improvement process - Public discussion on local communities and the private sector involvement in forest management
2	Survival rate of new plantations is low	<ul style="list-style-type: none"> - A network of local tree nurseries to improve acclimatization of seedlings to local climate and soil - Providing plant materials of tree and shrub species with high quality and only to locations where chances of survival are high - Careful selection of forest lessees (tenants) or CFM/private groups, who are ready to take full responsibility for the planting and protection of plantations - Strengthening of control by forestry enterprises implementation of contractual obligations of tenants
3	Plantations destroyed by livestock grazing	<ul style="list-style-type: none"> - Develop and implement an integrated forests and pastures management plans in INRMCRPs, strengthen control over the implementation of the plan
4	Limited investments from the private sector to forest plantations	<ul style="list-style-type: none"> - Develop and implement a list of regulatory legal acts and incentives that give a guarantee to investors to use the plantation in the long term, subject to compliance with contractual obligations
5	Downward spiral of current forest resources due to growth in rural energy consumption and in urban construction needs	<ul style="list-style-type: none"> - Dedicating part of afforestation and reforestation target areas to selected fuelwood tree species - Incentives for high-efficiency household stoves and alternative energy - Higher efficiency and minimized waste in wood processing

ANNEX 1. AIYL AIMAGS AND PASTURE AREAS IN THE FOUR TARGET AREAS

Aiyl aimaks and pasture areas in Suzak district of Jalal-Abad oblast

№	Aiyl aimak	Total pasture area ha	Of which:		Used Pastures in ha
			Summer, ha	Spring-aut. ha	
1	Kara-Darya	9643	3081	6562	9643
2	Suzak	8890	2348	6542	4564
3	Yrys	6570	2638	3932	5000
4	Atabekov	6746	3733	3013	6746
5	Bars	8650	4938	3712	8650
6	Tash-Bulak	5656	2591	3065	5656
7	Kyzyl-Tuu	21335	16927	4408	16000
8	Kyz-Kol	12245	7355	4890	2000
9	Lenin	475	36	439	475
10	Bagysh	11600	8396	3204	5630
11	Kok-Art	5002	3478	1524	3260
12	Kurmanbek	12621	6046	6575	5137
13	Kara Alma	19286	18797	489	19286
14	Kok-Zhangak	259	0	259	259
	Total by area	128,978	80,364	48,614	92,306

Aiyl aimaks and pasture areas in Toguz-Toro district of Jalal-Abad oblast

№	Aiyl aimak	Total pasture area ha	Of which:		
			Near	Middle	Distant
1	Atay	23039	13661	5831	3547
2	Kara-Suu	23436	10903	6951	5582
3	Kargalyk	51930	30573	14814	6543
4	Kok-Irim	34962	19129	10913	4920
5	Toguz-Toro	61171	34618	26533	-
	Total by area	194,534	108,884	65,062	20,592

Aiyl aimaks and pasture areas in Ak-Talaa district of Naryn oblast

№	Aiyl aimak	Total pasture area ha	Spring-autumn	Summer	Winter
1	Kosh Dobo	56127	20435	28277	7415
2	Zherge Tal	43514	21500	14672	7342
3	Konorchok	3126	1042	2800	284
4	Kara-Burgon	43612	11744	27156	4312
5	Ak-Chiy	23141	4000	14181	4960
6	Baetov	30356	9206	16200	4950
7	Terek	18386	5462	9462	3462
8	Ugut	34244	5000	25744	3500
9	Ak-Tala	28129	5858	20641	1630
10	Kok-Jar	24171	4691	11041	8439
11	Jany-Talap	9074	4390	2684	2000
12	Togolok Moldo	21991	10191	7693	4107
13	Kyzyl-Beles	14936	3936	9000	2000
	Total by area	350,807	107,455	189,551	54,401

Aiyl aimaks and pasture areas in Uzgen district of Jalal-Abad oblast

	Aiyl aimak	Total area ha	pasture Used Pastures ha	Unused Pastures ha	Headcount (animal unit)
1	Kyzyl-October	9795	2632	7163	6907
2	Kurshab	9857	3500	6357	10008
3	Karool	3603	1245	2557	6958
4	Zhalpak-Tash	9882	4781	5101	9457
5	Kara-Tash	2256	2256	-	1679
6	Bash Dobo	2537	1602	1548	7060
7	Don-Bulak	3250	3250	599	8438
8	Myrza Ake	6393	4316	2076	7694
9	Ak-Zhar	5616	3864	1755	5646
10	Kolduk	9729	4004	5725	7819
11	Salamalik	24932	5570	19362	4149
12	Kyzyl-Too	5178	4170	1008	6787
13	Jazy	6737	3605	3132	6637
14	Zerger	17650	7200	9944	7968
15	Iri-Suu	12449	5590	6859	8945
16	Zhylaldy	5134	3834	1300	3639
17	Tort-Kul	7275	6570	705	10113
18	Altyn-Bulak	6423	3396	2966	5138
19	Changet	8163	3092	3960	4277
	Total by area	153257.5	74477.7	82120.6	129,321

ANNEX 2. LITERATURE

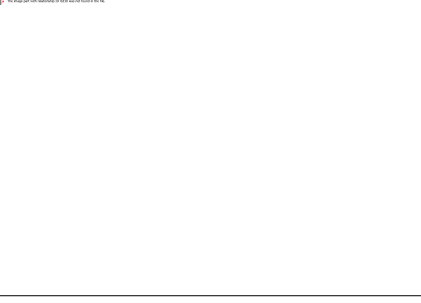


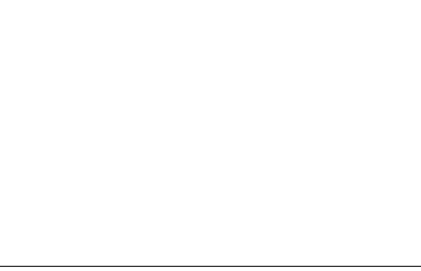
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Annex 3. Fact Sheet of selected trees used for afforestation/reforestation and forest restoration in Kyrgyzstan

Common Name	Scientific name	Appearance	Uses	Habitat range	Regeneration	Growth / age
Coniferous trees						
Tian shan Spruce (Schrenkian Spruce)	<i>Picea schrenkiana</i> <i>Picea tianshanica</i> (Rupr.)	Up to 45 m. tall Trunk diameter of up to 1-1.5 m. Narrow conical crown with level branches Needles 1.5-3.5 cm long, dark green	<u>Timber</u> for construction, <u>paper</u> production	altitudes of 1,200–3,500 metres	Seeds from cones, seedlings planted 3-4 years old: up to 5,200 seedlings/ha	Slow growth, up to 80-120 years
Juniper	<i>Juniperus turkestanica</i> <i>Juniperus semiglobosa</i>	<u>Coniferous shrub</u> or small to medium-sized up to 15 m. tall Trunk up to 1.2 m girth Scale-leaves 1–2 mm long on older trees	Erosion control, <u>windbreaks</u> , medicinal cone-like berries	Altitudes of 1,550–4,350 metres	Seeds from cones, seedlings planted 3-4 years old: up to 4,380 seedlings/ha	Slow growth, up to 80-120 years
Broadleaved / deciduous trees						
Silver Poplar	<i>Populus alba</i>	Medium-sized <u>deciduous tree</u> Height of up to 16–27 m Trunk up to 2 m in girth A broad rounded crown, <u>leaves</u> 4–15 cm long	Boxes, <u>light timber</u> , cellulose, <u>firewood</u> , windbreaks	From floodplains with high water tables up to 2,000 m altitudes	Propagates from seeds and branch sticks. 1-2 years old seedlings planted 2,500/ha. Produce <u>root suckers</u> from the lateral root, forming colonies	Fast growth: lowlands 20 years. In highlands 40-50 years.
Black poplar / pyramid poplar	<i>Populus nigra</i> syn. <i>Populus pyramidalis</i> Rozier	A riparian tree species, growing predominantly on floodplains in mixed forests. Pioneer species and can grow into large colonies and stands or can produce large trees in isolation or persist in mixed forests.	Boxes, <u>light timber</u> , cellulose, <u>firewood</u> , windbreaks	From floodplains with high water tables up to 2,000 m altitudes	Seeds are dispersed by wind or water. Branch sticks can be directly planted.	Up to 400 years
Walnut	<i>Juglans regia</i> L.	Seven basic varieties, further divided into at least 280 varieties on the basis of phenotype of trees and walnuts. Flowers of both sex are in the same tree, so walnut is monoecious. Only male flowers are visible.	<u>Nuts</u> are highly priced, and old walnut tree timber is used in luxury woodworking	1,100-2,200 m altitudes	2-year seedlings 1,300/ha. Closed root seedling production has been started to extend planting period and improve survival rate. Crafting has been started on experimental scale to improve yields and spread out early-ripening & early nut-producing varieties.	Fencing for first 10-15 yrs. Produce nuts until 20-40 years age Old trees suffer from a polypore which decays trunk. Productive trees live up to 100-120 yrs.

Pistachio	<i>Pistacia vera L.</i>	Up to 5-10 m tall with thick branches Trunk around 0,6-0,8 m girth A dioecious tree: natural pistachio forest has a 1:1 sex composition	Pistachio <u>nuts</u>	Seeds are sown on 700-1,400 m altitudes	6-8 seeds are planted in 1 m ² plots, 125-555 plots per ha. 875 - 3,885 seeds per ha.	Fencing for first 10-15 yrs. Harvest starts at year 10, and trees last for 60-80 yrs.
Wild cherry	<i>Prunus cerasifera</i> <i>Prunus magalebская</i>	A small tree or shrub of 2-4m height, small white flowers, juicy black fruits. Forms usually the second layer in a mixed forest with walnut. Provides a good micro-climate, shadowing and pollinators that benefit other trees.	Cherry <u>fruits</u> are sold fresh and in jams.	Up to walnut range.	Seedlings are commonly sold in commercial nurseries for gardens, also crafted in leskhoz nurseries. Can be used in tree planting in degraded forests with walnut.	

Text Box 2. Walnut for A/R, enrichment planting and high-value nut crops in Kyrgyzstan

<p>Natural forests of walnut (<i>Juglans regia</i> L.) occupies a belt in the altitude range from 1100 to 2200 m above sea level in Kyrgyzstan. Distribution of walnut on higher areas is limited by low temperatures, and the lower limit of walnut is limited by the lack of precipitation, especially in summer. Although the Kyrgyz nuts can be considered the largest ones in Central Asia, the average yield is relatively low: from 40 kg-170 kg / ha. These are from wild forests with a suitably formed small crown, a high trunk, a large number of low-fertile, or infertile trees. Similarly, low yields also apply if walnut plantations are established in unfavorable growing conditions. In harsh climate (late spring frosts, arid summer, early spring frosts), the entire crop may be lost. The production of stable high walnut yields can be ensured only by the creation of plantations from high-yielding resistant varieties and supported by intensive agro-technologies. (See natural walnut forest in the right)</p>		
<p>There are fast-growing varieties of walnut which allow plantation-based, semi-industrial walnut cultivation. The fast-growing forms begin fruiting earlier and are reaching higher productivity. For example, varieties 7A and 15A of <i>Juglans regia</i> L. are fast-growing, bear fruit well, and often form fruit on shoots from lateral buds and from secondary flowering. They are also resistant to diseases and changes of environmental conditions.</p> <p>The most promising forms of walnut are distinguished by a complex of biological and economic-valuable traits. These forms include: 3A, 4A, 10A, 11A, 12A, 2K and AB. They fruit regularly, are resistant to frost and produce high quality nuts. Among the selected forms, as a late-flowering form, form 2K and AB, self-pollinating forms 3A, 4A and 11A can be distinguished.</p>		
<p>Seed propagation of walnut</p> <p>Walnut is propagated in both seed and vegetative manner. With the seed method of reproduction, the characteristics of the variety in the offspring are not preserved. This method is used in the mass cultivation of planting material used to create forest stands, for growing common walnut (<i>Juglans regia</i> L.) or black walnut (<i>Juglans nigra</i> L.). For the cultivation of seedlings of these breeds, only well-ripened, non-dried nuts are used.</p>		
<p>Cultivation of walnut with closed root system (in plastic containers or bags)</p> <p>This method allows to grow seedlings in a small volume of the substrate and to preserve the root system intact during transplantation. This increases the survival rate and allows to obtain a more uniform planting material from a smaller nursery land area and to shorten the period of its growth. The growth of plants depends on the quality of the substrate and the agro-technology, and on the size, shape and the material of seedling containers. Containers / bags are typically made of polyethylene film and hard plastic, baked clay, foil, etc. Before planting, the root system is released from the containers and the seedlings are planted with a substrate clump.</p> <p>In the fieldwork it was observed that also recycled five-liter water containers were used in closed root growing of tree seedlings. While the reuse of such bottles is ecologically good, there were some observed impracticalities associated with the practise. Bottles are made of transparent plastic what requires that they must be placed to the ground with</p>		

<p>shades on the sides so that the roots do not expose to sun and wither. Secondly, the container shape is contoured what makes it difficult to remove the seedling and its root soil clump intact. As a result, containers are sliced open and are discarded after one use.</p>	
<p>Planting of walnut</p> <p>In afforestation/reforestation and in establishing industrial walnut plantations, 1,300 one-two years old seedlings are planted and fenced per hectare. In afforestation /reforestation, seedlings are planted on plots of 10x8m, 10x10m or 10x12 m. Between the main tall tree varieties of walnut, fast-growing forms of walnut are planted. This Project applies 5x5 m planting density in forest restoration (enrichment planting of degraded forests) with 5-6 yr. old seedlings, which need to be fenced or tubed.</p> <p>A walnut can be planted in autumn and spring. Spring planting should be done in the shortest possible time. In autumn they are planted approximately 20 days before the onset of winter cold. The pits are dug with a diameter and depth 60-70 cm. During the planting, the roots of the seedlings are dipped in clay slug (mash) from the soil, humus with the addition of water.</p> <p>2-3 buckets of water are poured in to provide soil subsistence and improve rooting. When the water is absorbed, the pit is covered with loose soil.</p>	
<p>To obtain high harvests of nuts, fertilizers should be introduced. The best are manure and compost containing all the necessary substances. Under fruit-bearing plantations, organic and mineral fertilizers are introduced every 2-3 years, phosphorus and potassium in autumn, and nitrogen in spring. It was also suggested that a mix of dung, crushed quartz of Toktogul rayon, and soil can be used.</p> <p>To obtain guaranteed and sustainable crops, irrigation of the plantation is necessary and economically justifiable, as it almost doubles the yield of nuts. Following the planting pit watering of the seedlings, three to four spring-summer watering and one autumn moisture-charging (300-500 liters of water per plant) are done in the next three years. Starting from 4-5th years, the norm of irrigation is increased to 700-1,000 liters, and with full fructification up to 1.5 m³ of water per plant. It is recommended to irrigate in the first half of May, June, July, August and after the fall of leaves (in Oct.-Nov.). The greatest need for irrigation is in June and July, when there is fruits grow intensively and develop regenerative organs for the following year.</p>	

Source: Recommendations for the creation of walnut plantations

FOOD AND AGRICULTURAL PROGRAM OF THE UNITED NATIONS / INSTITUTE OF WALNUT AND FRUIT CROPS / ASSOCIATION OF FOREST USERS AND LAND USERS OF KYRGYZSTAN. Authors: MAMADZHANOV D.K., KENZHEBAEV S.K.

Text Box 3. Pistachio for Afforestation / Reforestation and tree crops in Kyrgyzstan

Main pistachio sub-species in Kyrgyzstan is *Pistacia vera* L. In 60-80 years it grows into small tree of 4-6 m, sometimes 10m tall, and 0,6-0,8 m sometimes up to 1 m in diameter. According to literature the oldest pistachio trees can reach up to 700 years². In Kyrgyzstan's growing conditions the *Pistacia vera* L. is richly branched, and usually reaches around 0,6 m diameter, up to 5 m tall, and have a well-developed root system. *Pistacia vera* L. is a dioecious tree and occurs in natural pistachio forest at 1:1 sex composition. However, depending on climatic and ecological conditions sex composition of *Pistacia vera* L. can vary up to 60% of male trees³.

Plantations from the *Pistacia vera* L. in Kyrgyz condition are most productive in altitudes from 700 to 1200 m above sea level. In altitude 1400 m above sea level the trees grow very well, however because of lower temperature, yield of nuts is not high.

In order to meet pistachios ecological requirements, and based on biophysical conditions in Kyrgyzstan, it is recommended to use different seed (not seeling) planting schemes: 6x3m (555 plots/ha) 6x6m (278 plots/ha) 8x8m (156 plots/ha), 8x10m (125 plots/ha) planting scheme. Each plot is 1 m², where 6-8 seeds are dispersed.

After 3-4 years, when seedlings reach 1 cm stem diameter, grafting is needed. First pistachio yield will come in 3-4 years after grafting (from 6-8 years old trees). In pistachio plantations, male trees should be limited to max. 10%. 10 year old trees start to give proper harvest in plantations. Average yield per tree is around 1-2 kg per year.

In order to provide a high survival rate and avoid grazing, plantations have to be fenced at least 10-15 years.

Fertilizing is recommended: 100-120kg/ha of nitrogen, 75-90 kg of phosphor and 15-20kg of kalium⁴.

Ozolin V.E. The Pistachio trees South of Kirgizia, Frunze, 1969 – p.17.

² Whitehouse W.E. The Pistachio nut – a new crop for the Western United States // Econom. Botany. – 1957. –V.11. -#4. – P. 281-321.

³ Bolotov C. Establishment of industrial pistachio plantations in The Sought of Kirgizia, Frunze, 1985 – p.21.

⁴ Kengebaev S.K. Growing of *Pistacia vera* L. in Plantations in Kyrgyzstan, Bishkek, 2011 – p.7.

Text Box 4. Activities allowed by legislation in different zones in national parks, leskhozoes

Policy	# and year	Functional zoning of the forests	Project Area
Law on specially protected natural territories of the Kyrgyz Republic	#18, 2011	<p>State Natural Reserves (Zapovednik)</p> <p>Functional zoning in State Natural Reserves takes place according to the following zones:</p> <ul style="list-style-type: none"> - Core zone (main zone) <p>In core zone any economic and other activity is forbidden, except for activities: protection of the natural complexes, to recover and prevention of changes of natural complexes and their components due to anthropogenic impact;</p> <ul style="list-style-type: none"> - to maintain conditions that ensure sanitary and fire safety; - for the implementation of environmental monitoring; - to perform scientific research; - to exercise state control over compliance with the established regime. <ul style="list-style-type: none"> - Buffer Zone <p>In the buffer zone of state nature reserves, in order to prevent negative impacts on the state of biological and landscape diversity, it is prohibited:</p> <ul style="list-style-type: none"> - the creation of new settlements; - provision of territory for hunting grounds, organization of hunting farms and accommodation of hunting bases; - construction, placement and operation of production facilities; - exploration and mining of minerals; - all kinds of felling, except for selective-sanitary in coordination with scientific institutions; - introduction (acclimatization) of new species of plants and animals; - actions that change the hydrological regime of the core of the reserve, and other activities that may have harmful effects on the ecosystem as a whole; - economic and other activities that threaten the state of natural complexes and objects. <ul style="list-style-type: none"> - Protected Zone <p>In the protected zone of the state natural reserve, the main types of economic activities that do not damage the state of natural resources are resolved. It is prohibited:</p> <ul style="list-style-type: none"> - collection of medicinal raw materials, fruits, berries and flowers, as well as plant species listed in the Red Book of the Kyrgyz Republic and under threat of extinction; - hunting, trapping animals, ruining nests, burrows and other shelters and dwellings of wild animals, as well as collecting eggs for birds and reptiles; - acclimatization of wild animals; - other activities that result in a decrease in the natural, scientific, cultural and aesthetic significance of the state natural reserve. 	

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Regulation of the Government of the Kyrgyz Republic on “Procedures of forestry inventory in the Kyrgyz Republic” Instruction on inventory approved in 2017 by Director of the State Agency for	#706, 2015	<p>Part 2, point 25 of the Procedures:</p> <p>Procedures of forest inventory in the Kyrgyz Republic establishes unified rules for forest management on the lands of the state forest fund, specially protected natural areas, as well as in forests that are not part of the forest fund. An inventory is conducted on the lands of the forest fund, specially protected natural areas according to the developed, discussed and approved methodology/instructions.</p> <p>The methodology / instructions for collection of information on assessment of forest resources and inventory during forest management operations is developed and approved by the authorized state body in agreement with the National Academy of Sciences of the Kyrgyz Republic. According to the given instructions functional zoning of forests of the Leskhozes are distinguished as:</p> <ol style="list-style-type: none"> 1. Forest exploitation zone - forest areas where activities like felling/cuttings with wood removal are possible. Conduction of silvicultural works and forest use is also permitted on these lands. The categories of forestlands (covered with forest and non-closed forest cultures) are taken into account. 	<p>“Ak Talaa” leskhoz</p> <p>“Uzgen” leskhoz</p> <p>“Toguz-Toro” leskhoz</p> <p>“Kara-Alma” leskhoz</p> <p>“Ortok” leskhoz</p>

Environmental Protection		<p>These areas also include admissible steepness of the slope up to 35 degrees, availability of roads for forestry and fire prevention purposes, horse dragging.</p> <p>2. Zone only with the possibility of planting forest and forest use – possibility to plant forest, use forests and cut the forest without removal (due to lack of logging roads or unprofitable wood removal).</p> <p>3. Non-operational zone - transport inaccessible areas, areas with a steepness of more than 35 degrees. Impossibility of forestry works. Non-forest, uncultivated land (rocks, wasps, steep slopes, bogs etc.)</p> <p>Each leskhoz conduct its own inventory using the given procedures and instructions.</p>	"Urumbash" leskhoz
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