

Tien Shan Ecosystem Development Project**ENVIRONMENTAL
AND SOCIAL ASSESSMENT****The Republic of Kazakhstan, The Kyrgyz Republic****This report was requested by the State Agency of Environmental Protection and Forestry of the Government of the Kyrgyz Republic, and the Forestry and Hunting Committee of the Republic of Kazakhstan****The report was prepared by the Institute of Water Resources Ecology and Desertification Problems***Team composition:**From the Kyrgyz Republic: Shukurov E.Dj., Asylbaeva Sh. M., Beksultanov M.A., Gabrid N.V., Gorborkova G.L., Karpachev K., Orolbaeva L. E., Sultanbaev M.;**From Republic of Kazakhstan: Ogar N.P., Valdshmith L.***Bishkek February 25, 2009**

TABLE OF CONTENTS

ACRONYMS	4
Executive summary	5
INTRODUCTION	5
PROJECT DESCRIPTION	6
Project Objectives.....	6
Project Components.....	7
ENVIRONMENTAL & SOCIAL ASSESSMENT (ESA)	10
1. TASK	10
Policy, legal and institutional frameworks of the Kyrgyz Republic and the Republic of Kazakhstan.....	10
Legal & Institutional Framework for Environmental Assessment/Management.....	11
Safeguard Policies Triggered.....	11
<i>Involuntary Resettlement: Access Restriction to Natural Resources (relevant for component B)</i>	12
<i>Access to land & natural resources under the Kyrgyz Legislation</i>	13
2. TASK	14
BASELINE DESCRIPTION	14
SOCIAL SURVEY	20
General information	20
Survey's Conclusions and Recommendations	21
3. TASK and 4. TASK	24
ENVIRONMENTAL IMPACTS	24
ANTICIPATED POSITIVE IMPACTS.....	24
POTENTIAL NEGATIVE IMPACTS AND RECOMMENDATIONS ON PREVENTIVE OR MITIGATION MEASURES	28
1. Impacts from small-scale construction works at specially protected natural areas (SPNA).....	28
2. Management of solid waste and wastewater	29
3. Increased competition for irrigation and increased competition for obtaining access to irrigation infrastructure.	29
4. Long-term demand for irrigation in areas with scarce water resources.	30
5. Negative impact for soil quality under preparation of areas.	30
6. Increase of fire hazard	31
7. Non-regulated usage of fertilizers, pesticides and herbicides	31
8. Access to pasture areas, reduction of existing pastures.....	32
9. Allocation of project benefits between the stakeholders.....	32
10. Allergic risks	33
11. Effects on cultural objects (nature relicts, sacred places).....	33
ANALYSIS OF ALTERNATIVE OPTIONS	33
5. TASK	34
Environmental Management Plan (EMP)	34
Guidelines for Environmental Selection of Investments	34
Application of environmental selection criteria against investments.....	34
PIU (Project implementation Unit) review & approach.....	35
Review & approval in SAEFP.....	35
Field supervision & monitoring.....	35
MONITORING PROGRAMME.....	36
Monitoring of forest plantations	37
6. TASK	39
INSTITUTIONAL STRENGTHENING PROGRAMME.....	39
CONSULTATIONS WITH BENEFICIARIES	43
PROPOSED BUDGET	43
7. TASK	44
Annex A Environmental Policies, Plans and Programs of the Kyrgyz Republic	45
«Jasyl El» Programme	46
Programme for conservation and efficient management of water resources, fauna and development of network of specially protected territories till 2010	46
Annex B Principal KR & RK Laws, Regulations and Resolutions that are relevant to TSED Project	47
Annex C. Primary State Environmental Institutions that are relevant to the TSED Project	51

Annex D Tien Shan Access Restriction Process Framework	52
Annex E Species of Red Book IUCN at the Territory of Tien Shan	55
Annex F. Dynamics of composition of the main forest-generating species within the forests under the authority of SAEFP	58
Annex H. Vertical zonation and landscape types.	62
Annex J. Annual distribution of reforestation	65
Annex K. Social component	66
Annex L Instruction on state environmental expert examination (1997)	80
Annex M. Use of Herbicides	83
Annex N. Mitigation Plan	87
Annex P - Minutes of the public hearings to discuss the draft social & environmental assessment of the “Tien Shan Ecosystems Development” Project	93

ACRONYMS

AO	Aiyl Okmotus, local Self-Government Administration
AK	Aiyl Kenesh, local Self-Government Council
CDS	Country Development Strategy
EA	Environmental Assessment
EAMP	Environmental Assessment and Management Plan
EMP	Environmental Management Plan
KR	The Kyrgyz Republic
IFAD	International Fund for Agricultural Development
IBRD	International Bank for Reconstruction and Development
LSG	Local Self-governments
LH	Lezkhos, local Forest Enterprise
MAWRPI	Ministry of Agriculture, Water Resources and Processing Industry of the Kyrgyz Republic
MDG	Millennium Development Goal
NEAP	National Environmental Action Plan
NGO	Non-governmental Organization
PIU	Project implementation unit
RK	The Republic of Kazakhstan
SAEPF	State Agency for Environment Protection and Forestry under the Government of the Kyrgyz Republic
SEE	State environmental expert examination
SFF	State Forest Fund
SMP	Small grants program
SPT	Special protected territories
TSEDP	Tien Shan Ecosystem Development Project
WB	The World Bank
WTSBCP	Western Tien Shan Biodiversity Conservation Project

Executive summary

An environmental and social assessment (ESA) was conducted as part of the appraisal of the proposed **Tien Shan Ecosystem Development Project (TSEDP)** of the Kyrgyz Republic (KR) and the Republic of Kazakhstan (RK) with co-financing of the International Fund for Agricultural Development (IFAD) and the Global Environmental Facility (GEF). The TSEDP comprise the following three components:

- A. Strengthening Biodiversity Conservation in Protected Areas and Productive Landscapes
- B. Forestry and Carbon Trading in the Kyrgyz Republic
- C. Project Management

Because the proposed project deals to a large extent with environmental management and improvement of environmental and socio-economic conditions in the Tien Shan and beyond, the overall environmental and social impacts are expected to be positive and to outweigh any negative impacts.

The proposed project will trigger the World Bank safeguard policies on Environmental Assessment (OP/BP 4.01), Involuntary Resettlement (OP/BP 4.12; Access Restriction to Natural Resources), International Waterways (OP/BP 7.50), Natural Habitats (OP/BP 4.04), Forests (OP/BP 4.36) and Pest Management (OP/BP 4.09). According to these policies, this ESA provides Environmental Management Plan (EMP), Access Restriction Process Framework (ARPF) / Resettlement Policy Framework (RPF) and Social Accountability Strategy (SAS). The proposed environmental and social management describe measures to avoid, minimize, mitigate or offset negative and enhance positive environmental and social impacts. Potential negative risks/impacts, as well as appropriate preventive actions, mitigation measures were identified in order to prevent, eliminate or minimize any anticipated adverse impacts.

The ESA confirms that in accordance with the project objectives, the implementation of the TSEDP would contribute globally to improved biodiversity conservation and ecosystem restoration, reduced pressure on natural resources, climate change mitigation, and increased sustainability of the Tien Shan mountain ecosystem. Locally, the project would improve environmental and socio-economic conditions by developing sustainable tourism, establishing carbon payment schemes for forestry, improving rural economy and access for rural population to forest products, promoting protective forest functions and increasing financial sustainability of the Forestry and Environmental Administrations.

INTRODUCTION

Tien Shan is one of the largest mountain systems in the world with the altitude reaching 7439m above sea level (Victory peak). It is located in the heart of the Eurasian continent between latitude 39°30' and 44° 30' North and longitude 71° 30' and 95° East, stretches 2275km from west to east and 585km from south to north. Its larger part is located in Kyrgyzstan (more than 3500km²), in Kazakhstan (about 1900km²), in China (1340km²), in Uzbekistan (about 600km²) and in Tajikistan (100km²). The Tien Shan is characterized by a high degree of biodiversity concentration. Various ecosystems, ranging from glaciers to deserts, in a relatively small area of Central Asia with a sharply continental climate requires special attention to the conservation of natural balance of ecosystems, including biodiversity conservation.

The area is also extremely important in terms of global agro-biodiversity. In the Kazakh regions of Zailiyskiy and Djungarskiy Alatau as well as in the Fergana and Chatkal mountain ranges of Kyrgyzstan the mountain wild-fruit forests present a natural habitat for agro-biodiversity of unique value. About 100 species of wild congeners/progenitors of 24 cultures are growing here. The global value of mountain agro-biodiversity is found in that wild-fruit plantations are source of the unique gene pool. Currently the areas of wild-fruit forests are reduced, they are under degradation and subject to numerous threats caused by destruction of natural habitat of mountain agro-biodiversity as a consequence of overgrazing, fires, dense site coverages and operations within the territory of mountain wild-fruit forest belt, inadequate management of wild-fruit ecosystems, genetic erosion and introduction of aggressive and alien species, poor social & economic life conditions of population.

Tien Shan forest ecosystems play an important role for biodiversity by providing habitat for flora and fauna species, erosion control and carbon sequestration. Tien-Shan covered by more than 1 million ha of forests. Before the Second World War, it had around twice this amount of forested area. The main reasons for the reduction have been intensive timber felling for economic needs during and after the war, overgrazing of collective farms' livestock, more recently increasing forest degradation due to encroachment for grazing and fuelwood collection, as well as lack of forest regeneration and reforestation activities. Forest resources are very important for rural livelihoods and economy and for the sustainability of mountain ecosystems. Therefore, biodiversity conservation, forest restoration, improved forest management and the promotion of small-scale fast-growing plantations and orchards on the community level are important socio-economic and environmental objectives for the Government of the Kyrgyz Republic and Republic of Kazakhstan. Similar picture is observed in adjacent part of Tien Shan in Kazakhstan.

PROJECT DESCRIPTION

Project Objectives

The proposed TSED project will be implemented in two countries - Kazakhstan and the Kyrgyz Republic – with the potential for replication in other countries in the region. The proposed project has both global and local development objectives.

The main **global objectives** are to:

- Increase sustainability of the Tien Shan Mountain Ecosystem of Kazakhstan and the Kyrgyz Republic
- Improve biodiversity preservation through strengthening conservation and protection of specially protected areas and extension of forest habitat to sustain biodiversity of Tien Shan region in Kazakhstan and Kyrgyzstan;
- Reduce pressure on natural resources by increasing the environmental benefits generated by improved forest management and eco-tourism;
- Mitigate climate change through reforestation to reduce emission of greenhouse gases (CO₂) in the Kyrgyz Republic;

The main **local objectives** are to:

- Reduce anthropogenic pressure on natural ecosystems and natural resources through development of sustainable tourism and increase of income of local population;
- Earn incomes from selling certified carbon received as a result of afforestation in the Kyrgyz Republic and to share this practice in the region;
- Increase income of rural population by means of wood and non-wood forest products and incomes from selling certified discharges received as a result of afforestation and foresting;

- Reduce water and wind erosion of soil by creation of erosion-preventive and wind-protective forest strip by means of ecosystem approach. Plant 13,950 ha of new forests to reduce erosion of soil, prevent avalanches and mudflows and decrease water logging caused by deteriorated drainage systems;
- Increase financial sustainability of the SAEPP of the KR and AO thanks to revenue generated by carbon (certified discharges) trading.

Project Components

The proposed project will comprise the following three components:

A. Strengthening Biodiversity Conservation in Protected Areas and Productive Landscapes

- A.1. Protected Area Management
- A.2. Conservation in the Broader Landscape through Small Grants
- A.3. Sustainable Tourism Promotion

B. Forestry and Carbon Trading in the Kyrgyz Republic

- B.1. Afforestation and Reforestation
- B.2. Validation and Monitoring of Carbon Sequestration
- B.3. Improved Sustainable Forest Management

C. Project Management

A. Strengthening Biodiversity Conservation in Protected Areas and Productive Landscapes (approx. cost US\$ 6.9 million, GEF Grant: US\$2.35 million for Kazakhstan and US\$1.0 million for the Kyrgyz Republic)

This component will have mostly global objectives of biodiversity protection. It will contribute to improve in-situ biodiversity protection by (i) increasing the capacity and coverage of protected areas (PA) and (ii) promoting environmentally friendly practices and improving the management of the productive landscapes, including forests, natural parks, and hunting reserves. To increase the coverage, the component will support the creation of the “Western Tien Shan Biosphere”, which was started under the Central Asia Transboundary Biodiversity Project. It will also provide technical assistance and goods for the management of different categories of protected areas in the region (such as natural reserves, parks, game reserves), so that they increase their effectiveness in protecting biodiversity. The component would also promote integration of protected areas into broader landscapes and sectors so as to maintain ecological structure and functions in order to reduce the threat to biodiversity.

The activities of this component will contribute to development of the Tien Shan ecological network, including protected areas of different categories (such as natural reserves, parks, game reserves) and buffer zones. This will be done based on development of closer cooperation between protected areas and (i) neighboring local communities, (ii) local authorities; and (iii) educational and scientific institutes, both at national and international levels. The component will support productive landscapes by improving the management of existing forests and supporting sustainable tourism both to increase the local benefits generated by protected areas and to generate income for local communities and for parks and protected areas. Productive landscape activities will support improved forest management, including fire prevention, and increase the demand for and supply of eco-tourism services by mainstreaming biodiversity concerns in tourism development.

B. Reforestation and Carbon Trading in the Kyrgyz Republic (approx. cost US\$12.2 million; IFAD Grant: US\$8.0 million). This component will contribute to forestation activities on 13,950 ha of marginal land to (a) mitigate climate change by sequestering greenhouse gases in forests; (b) develop a carbon trading mechanism to raise revenues from carbon sequestration; (c) recreate habitat for biodiversity; and (d) generate local benefits such as fuel and construction

wood, fruits, nuts, forage, and other non-timber forest products, and environmental benefits such as wind breaks and retention of snow charges for neighboring agricultural lands to reduce water and wind erosion, and reclaim agricultural land compromised by waterlogging, salinity, and erosion.

The following table summarizes areas planned to be forested, disaggregated by fast-growing or rapid-production species including elm, poplar, willow, and fruit trees such as almond, apple, apricot, cherry, peaches, pistachio, plum, seabuckthorn, and walnut, etc.; and slow-growing species such as juniper, pine, spruce, saxaul, and others. To avoid the risks associated with monoculture, multiple species will be used in reforestation activities.

Table 1 – Forestation Plan by Implementation Arrangement (Ha)

	ARIS	LEZKHOZES	PPP	Total	Share %
Fast-growing species	6,150		1,770	7,920	57
Slow-growing species	130	5,900	0	6,030	43
Total	6,280	5,900	1,770	13,950	100
Share in %	45	42	13	100	

Reforestation will be implemented through three arrangements:

- **Community Development and Investment Agency (ARIS):** reforestation and afforestation by communities and private investors in Aiyi Okmotus (villages) and private lands in collaboration with ARIS/VIP, which has developed a methodology for local planning and management of resources.
- **Lezkhozes (LH):** forestation by State Owned Forest Enterprises or LH in State Forest Fund land; and
- **Public Private Partnerships (PPP):** forestation by private investors in State Forest Fund land

Soil preparation will be manual for most slow-growing species, only for poplar and elm the sites will be ploughed while taking into account standards to minimize soil disturbance. In combination with manual weeding, in some cases two herbicides, glyphosate (Roundup) for initial weed knockdown and Simazine for residual control will be use, and this would control weeds for a whole growing season. Apart from this no pesticides will be applied.

Initial estimates show that reforesting an area of around 13,950 ha should sequester around 500,000 tons of CO₂ by 2017. The BioCarbon Fund could be available to purchase around 500,000 tCO₂. This however will be revised on the basis of more detailed carbon sequestration estimates and particularly the potential level of emission reduction which could be achieved by 2012.

In addition, this component contributes to improving the management of existing forests and established plantations by: (a) continuing and expanding «Collaborative Forest Management» (CFM) activities in the Walnut Fruit Forest in the Southern Kyrgyz Republic to improve the protection of this unique livelihood system, and (b) providing technical assistance and capacity building to LHs and private sector.

C. Project Management (approximate cost US\$1.5 million, GEF grant: US\$0.33 million for Kazakhstan, IFAD: 0.7 million for the Kyrgyz Republic). Overall coordination of project activities and the fiduciary aspects of project management will be handled by the State Agency for Environmental Protection and Forestry (SAEPF) of the Kyrgyz Republic and the Forestry and Hunting Committee (FHC) of Kazakhstan. The FHC of Kazakhstan is implementing a new Forest Protection and Reforestation Project with IBRD financing, and fiduciary responsibilities

will be initially handled by the existing project unit. In addition the project will collaborate with the Community Development and Investment Agency/Village Investment Project (ARIS/VIP) in the Kyrgyz Republic for reforestation by communities in Aiyl Okmotu (village administration) land.

ENVIRONMENTAL & SOCIAL ASSESSMENT (ESA)

Primary objective of the assessment process is the delivery of environmental and social management documents (e.g. EMP, RPF) in which the measures to avoid, minimize, mitigate or offset negative environmental and social impacts, and enhance positive ones, will be documented. These management plans will be specific enough and contain enough detail to allow (i) mainstreaming into project design and (ii) the integration of implementation-ready provisions into tender documents for project implementation.

Secondary objectives of the EA will be to (i) establish a preliminary baseline of environmental conditions in the Tien Shan, (ii) identify any significant environmental or social risks/impacts of the proposed project (both positive and negative), and (iii) specify appropriate preventive actions and mitigation measures (including screening and approval of sub-projects and appropriate monitoring) to prevent, eliminate or minimise any anticipated adverse impacts.

A **third objective** is to integrate and accomplish all necessary activities and steps to comply with the Kyrgyz and Kazakh national legislation / regulations on environmental and social assessments, usually known as OBOC (OVOS). The Consultant shall thus prepare the ESA in a form and with contents acceptable both to the World Bank and the authorities of the two Client countries.

The ESA presents an **environmental management plan (EMP)** and adequate social instruments, such as an **access restriction process framework (ARPF) / resettlement policy framework (RPF)**. **7 assigned tasks** were performed to achieve the ESA objectives:

1. TASK

Relevant national environmental policies, laws and regulations, as well as relevant international environmental agreements and conventions to which either Kyrgyzstan or Kazakhstan is party were reviewed. Moreover, the World Bank safeguard policies triggered by the proposed project were reviewed and put into practical context. Relevant national policies, laws, and regulations relevant to land access, informal land use, and restricting access to protected areas were reviewed and described in the framework of a comparative analysis with the provisions of the World Bank's Operational Policy on Involuntary Resettlement (OP4.12).

Policy, legal and institutional frameworks of the Kyrgyz Republic and the Republic of Kazakhstan

The key national legal & regulatory acts (laws, regulations, resolutions of the Government and public authorities) of the KR and the RK as well as international agreements relevant to the TSED Project are shown in [Annex B](#). In accordance with national legislations of the KR and the RK in the case of discrepancy between national legislation provisions and international regulatory acts where either Kyrgyzstan or Kazakhstan is a party and which came into effect within their territory, the latter would prevail. The KR and the RK ratified and are the parties of such Conventions as Convention on Biological Diversity, Convention Concerning the Protection of the World Cultural and Natural Heritage, Convention to Combat Desertification, Framework Convention on Climate Change, Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Convention on Environmental Impact Assessment in a

Transboundary, Ramsar Convention on Wetlands of International Importance and others. The KR ratified the Kyoto Protocol to the Convention on Climate Change.

Environmental Policies, Plans and Programs

The national environmental policy of the KR and RK is based on a number of national strategies and action plans, which define the main objectives for environmental protection and sustainable use of natural resources. Key policies, as listed in [Annex A](#), demonstrate the Governments' engagement in environmental protection.

The RK adopted, implemented and launched the following policies and programmes: Strategic Development Plan of the RK until 2010, Environmental Conservation Programme for 2008 – 2010, Environmental Safety Concept of the Republic of Kazakhstan for 2004-2015, Programme for conservation and efficient management of water resources, fauna and development of network of specially protected territories until 2010.

The KR adopted, implemented and launched the following policies and programmes: Country Development Strategy (CDS) for 2006–2010, Environmental Safety Concept of the Kyrgyz Republic, National Environmental Action Plan (NEAP), National Strategy and Action Plan on Sustainable Development of Mountainous Territories of the Kyrgyz Republic, Millennium Development Goals (MDGs), Forestry Development Concept of the Kyrgyz Republic till 2025, National Forestry Programme of the Kyrgyz Republic for 2005-2015, National Forestry Development Action Plan of the Kyrgyz Republic for 2006-2010 in order to conserve and reproduce forest ecosystems, National Forest Inventory of the Kyrgyz Republic, and National Framework Programme for Sustainable Land Management until 2016.

Legal & Institutional Framework for Environmental Assessment/Management

Legal & regulatory acts of the KR and the RK related to environmental protection, nature management and biodiversity conservation encourage the conservation of flora, fauna and their habitats, identify the obligation of all legal and natural persons to use natural resources sparingly. Specific use of natural resources related to removal of flora & fauna species from their habitats is permitted only if they are prescribed areas and if there is a special license.

KR & RK legislations on ecological expertise (EE) and environmental impact assessment (EIA) bind all nature users planning environmental impact operations to be subject to EE & EIA procedures at planning phase. Control of implementation of sectoral legislations in force, state ecological or other specific expertise and nature management is imposed on KR & RK state agencies listed in [Annex C](#). Responsibilities of state agencies, interaction procedures are regulated by laws, by-laws and relevant Regulations to be approved by the KR & RK Governments. The assessment concludes that the project objectives are in line with the goals and supported by the KR & RK state environmental agencies.

Safeguard Policies Triggered

The TSEDP was classified under **Category «B» under the WB's Operational Policy (OP) 4.01, the main environmental safeguards policy**. The proposed project will trigger the WB Safeguard Policies indicated in Table 2. A partial **Environmental assessment** is required, as under category «B» there are no indications that the project impacts would be “considerable, irreversible, growing or long-term adverse”. The **environmental assessment** revealed a significant potential for positive impacts while potential negative impacts are limited, they can be efficiently prevented or reduced through the implementation of appropriate preventative actions and mitigation measures.

Table 2: WB Safeguard Policies triggered by the TSED Project

WB security control policy triggered by the TSED Project	Yes	No
Environmental assessment (OP/BP 4.01)	[X]	[]
Natural habitats (OP/BP 4.04)	[X]	[]
Pest control (OP 4.09)	[X]	[]
Cultural heritage (OP/BP 4.11)	[]	[X]
Involuntary resettlement (OP/BP 4.12)	[X]	[]
Indigenous peoples (OP/BP 4.10)	[]	[X]
Forests (OP/BP 4.36)	[X]	[]
Dam safety (OP/BP 4.37)	[]	[X]
Disputed areas (OP/BP 7.60)*	[]	[X]
International Waterways (OP/BP 7.50)	[X]	[]

Because future plantations will be situated on international waterways, the project triggers WB Safeguard Policy OP/BP 7.50 on International Waterways.

Involuntary Resettlement: Access Restriction to Natural Resources (relevant for component B)

The involuntary resettlement safeguard policy is triggered solely due to the possibility of reforestation activities leading to a restriction of access to natural resources where lands have been used for other purposes.¹ The project will not involve any forced withdrawal of land causing resettlement, loss of house, loss of property, loss of income sources as specified in the item 3 a) OP/BP 4.12 “Involuntary resettlement”.

Project design minimizes the risk of access restriction to natural resources by excluding lands that are currently classified as pasture or arable lands, or under any leasing/renting agreement. Project activities will be focused on marginal, low-productive lands of AOs and SFF lands that are clearly unsuitable for pasture or crops. While the ecological assessment conducted for site selection by the project field teams will identify the sites with least potential for this risk, it is possible for both land types that the lands to be reforested are currently used by local people as informal and mostly seasonal pastures. The project activities may in particular during early years restrict access to pastures, and therefore affect the livelihood of local livestock holders. While this risk applies similarly to both land types, it is lower on State Forest Fund lands designated for forestry purposes.

An Access Restriction Process Framework (ARPF, [Annex D](#)) was designed in order to minimize the risk of conflict between pasture use and forestry, and to ensure that no individual or collective livelihood is negatively affected by the project. The ARPF is currently explored and further adapted based on the experience in the pilot micro-projects.

Component A for biodiversity conservation will focus on the improvement of management in existing protected areas and does not seek to increase protected area. It is therefore unlikely to trigger the safeguard policy and to cause any restriction of access, while for the exceptional case it would, the same framework process can be applied.

* By supporting the proposed project, the Bank does not intend to prejudice the final determination of the parties' claims on the disputed areas.

¹ Detailed information regarding WB security control policy is available at:

<<http://go.worldbank.org/WTA1ODE7T0.A>>.

Access to land & natural resources under the Kyrgyz Legislation

In KR the issues related to access to land resources are regulated by Civil Code, Land Code, Forestry Code, Administrative Code, Criminal Code, Water Code, the Law on agricultural land management, a number of Governmental Resolutions and other relevant by-laws, amendments and addenda. Governmental decisions are subject to compulsory implementation on the territory of the Republic.

According to the legislation, the property right for agricultural land belongs to (1) the State, (2) solely to citizens of the KR who have been resident in the rural area for not less than two years, or (3) to agricultural cooperative societies of citizens of the KR who have been resident in the rural area for not less than two years. As a result of the land reform since 1999, 665,800ha or 77,6% of 858,400ha of irrigated agricultural lands are privatized, while 145,600ha or 20% are allocated to the state-owned Land Redistribution Fund (LRF) lands under the administration of the AOs and AKs.

LRF lands can be transferred for short-term (5-7 years), medium-term (7-10 years) or long-term (up to 50 years) leases, under conditions of efficient land management and complied agro-technical standards. Plot size differs for different land users: (1) to natural persons, within irrigated land up to 25 ha, and within arid land up to 50 ha; (2) to legal entities, within irrigated lands up to 50 ha and within arid lands up to 100 ha. Formal land use permits can be obtained by applying to the Land Committee under the AO, and the selection of users is in most cases based on tender and competition. The land use permit is based on an agreement between the user and the AO, according to the decision of the Land Committee.

The SFF comprises forest and non-forest land. It exclusively owned by the state, while the user right may be given for use to organizations and citizens of the KR, and certain other groups, with various types of uses ranging from pasture, collection of NTFPs, sanitary felling, fuelwood collection etc. According to the relevant Governmental Resolutions (*inter alia*, No. 377 of July 27 2001 on collaborative forest management, No. 482 of October 19, 2007 on the procedures of forest plots leasing and use) formal user arrangements vary in timeframe, eligibility of tenants, allocation process, payments and other conditions.

Any informal use on both SFF and LRF lands is illegal under the Land Code, Forestry Code, Administrative Code, and in some cases can be considered illegal under the Criminal Code. This legislation is to be enforced by local AOs and Gosregister for LRF lands, and by LH for SFF lands.

KR legislation about specially protected natural areas (state reserves, national parks, preserves) regulates the issues related to SPNA creation, operation, regime and access restriction. While creation of state reserves and national parks the preliminary sociological researches are carried out, outcomes of these researches are the base for the Government's decrees identifying their boundaries, zones and regimes.

During implementation of this project in the KR, in the course of selection of lands for forest-planting within the lands of LHs and AOs there should be an envisaged elaboration of legal issues securing property rights for grown production and obligations (responsibility) of executors as well a foreseen package raising public awareness.

2.TASK

Based on a review of available information and data on social and environmental conditions in the Tien Shan area, a preliminary baseline of environmental and socio-economic conditions for the project area was established. This baseline will be further adapted and completed during the first year of implementation.

BASELINE DESCRIPTION

General Evaluation of Current Situation (Development Trends for 2006-2008)

Physical and geographical features of the Tien Shan high mountain ecosystems that the territory of the KR and target territory of Kazakhstan refereed to predetermine their special natural instability and increased vulnerability to anthropogenic impacts. Tien-Shan has relatively small area (about 20%) with biosphere conditions suitable for settlements and agricultural production. However, pressures on this small portion of economically usable land are high, aggravated by fast population growth with the result of constant reduction of per capita availability of water and land resources and limited potential capacity of the ecosystems for expansion of productivity or buffering of natural fluctuations. This fact, along with poorly managed economic activity caused by resource intensive sectors continues to worsen environmental condition of the republic, which in some regions are threatening to turn into irreversible crises involving processes such as desertification, deforestation, soil erosion, mudflows, land slides and etc.

Issues related to climate change are starting to become a reality having serious impacts on human life and economic activity. This is new and serious challenge for Kazakhstan and Kyrgyzstan dictates the necessity to take urgent measures to prevent possible catastrophe, both in terms of natural resources, and in terms of social and economic activity. In Tien-Shan, the main regress factors related to climate change have already started emerging: reduced agricultural productivity, increased danger of extreme meteorological phenomena, alteration and even devastation of ecosystems and increasing threat for the health of the population.

According to official statistics in Kyrgyz part of target territory of the Project, 65% from total population of the country are accounted to rural area. Poverty rate remains high, while poverty is mainly concentrated in rural area, where three fourth of total poor population (1.8 million in Kyrgyzstan), and the population below poverty level live. Agriculture is the main livelihood for these people, including livestock breeding and crop cultivation. Major share of rural population migrates to large cities because of the lack of adequately paid jobs. Progressive urbanization of the territories (the lands of settlements as of the end of 2006 compared to 1995 increased by 84%) accompanies reduction of access of new constructions to centralized drinking water supply systems and adequate sewage systems. Despite the fact that in general in the country the share of the population having access to safe drinking water tends to increase annually and in 2006 made up 89.8%, however, more that half million people do not have access to safe sources of drinking water supply as before, which negatively impacts health condition of the population. The share of the population having access to adequate sanitary conditions from 2000 to 2006 reduced from 32.8% to 23.9%. This is caused by the deterioration of sanitation systems and appearance around the capital city Bishkek of a circle of newly erected buildings that are not provided with water supply and sewage systems. This factor is the reason of periodical outbreaks of mass infectious diseases.

Out of 10.6 million ha of agricultural land (arable land and pastures), 60% are threatened or already impacted by water and wind erosion. Out of 280,000 small farms in Kyrgyzstan, more than 84% have arable land of less than 1 ha. With such small land plots it is very hard to provide crop rotation, to arrange anti-erosion and forest plantation works. The absence of crop rotation on arable lands, violation of agrarian techniques of land processing, deterioration of the irrigation and drainage infrastructure and transformation of agricultural lands into other categories of land increase potential erosion danger and increase the risks of land degradation. Each farm needs to collect annual harvest to provide food supply, while the specific of the duration of production cycle (from planting to collecting harvest and obtaining income) of wood species cultivation, including fruit trees, does not allow farmers to use their land plots for forest plantations. The TSED project activity is rather attractive in this sense being aimed at growing wood species on the lands of LHs and AOs that are not used for agricultural production by farmers.

Biodiversity Conservation

5 special protected territories (SPT) are located at the area of proposed project with the area of 7.004 km² in Kazakhstan and 16 SPTs with total area of 19.205 km² in Kyrgyzstan. The area of special protected natural territories in KR increased from 4.37% in 2002 to 5.03% by 2007, which is conducive to enhancing mitigation factors for the consequences of climate change. In 2000, “Issyk-Kul” biosphere territory with the area of 4,314 thousand ha, which has a status of protected natural territory was established. On the Kazakh part of the Tien Shan a new Ugam-Sairam National park was organized, includes west Tien Shan reservation area including Kara Taus national park that has been established in the year of 2005. In Tien Shan (on Kyrgyzstan and Kazakhstan territories) there are 9 species of mammals, 27 species of birds, 1 specie of reptile and 1 fish specie that are included into the Red book of IUCN (Annex E).

It should be noted that with increasing of the area and the number of SPTs in the KR the amount of funding from the state budget does not increase. Their material, technical and research base becomes obsolete and gets deteriorated, however, not all reserves and natural parks are able to strengthen their capacity adequately, while social and economic condition of SPT staff forces them to deal with other income generating activities, including illegal hunting, cutting of trees, collection of fruit and berries in protected areas. The activity of TSED project aimed at capacity building and widening coverage of special protected areas along with facilitating promotion of environmentally friendly methods and enhancing effectiveness of productive landscape management will have positive impact on biodiversity conservation in general on the project area.

Forest Ecosystems and reforestation (relevant for the KR)

The forests of the KR are the property of state and form a unified State Forestry Fund (SFF), which includes forested areas and areas that are not covered with forest but designated for forestry purposes. Total area of SFF lands constitute 3,321.5 thousand hectares as of 1st of January 2003. Forested land constitutes an area of 864.9 thousand hectares, percentage of forestland constitute 4.32% from the territory of the republic. The objective of forest policy of Kyrgyzstan is to achieve increasing of the area covered with the forest to the level of 6% from total area of the country, which will make up about 1,200 thousand ha of the area covered with forest at the lands of SFF.

The forests of the KR are composed of 4 varieties: walnut-fruit, coniferous – firry, archa (*Juniperus spec.*) and flood plain forests. Total resources of timber of all kinds in the KR constitute 28.87 million cubic meters, including: Tien Shan spruce (*Picea shrenkiana*) – 15.35 million cubic meters; Turkestan, Zeravshan and Hemisphere juniper (*Juniperus spec.*) – 3.78

million cubic meters; walnut-fruit, walnut (*Juglans regia*) – 3.76 million cubic meters; hard-leaf (oak, ash-tree, maple) – 1.55 million cubic meters; soft-leaf (birch, poplar, willow) – 1.19 million cubic meters; bushes – 2,2 million cubic meters². Distribution of the areas broken down by species is given in Annex F, where it may be seen that shrubbery occupy the largest area (43.8%), conifers (35.6%), and other wood species: walnut, pistachio, apple (13.9%). Fast growing species such as poplar, aspen, and willow occupy the area of 12.9 thousand ha, or 1.5%.

Since 1998, the KR implements the reform of forest sector aimed at the introduction of the new forms of forest management to achieve sustainable use of forest resources. The following forms were introduced in the republic: community-based forest management³, various forms of woodlot lease, and the procedures of transfer of some production activities to private sector. The National action plan for forestry development of Kyrgyzstan (NAP), approved by the Government of KR envisages annual planting of wood species on 2 thousand hectares of the territory of SFF and on 1 thousand hectares beyond SFF (on the land of AO). TSED Project provides forestation works at the area that is not covered with forest during 5 years, including at 7 thousand hectares of the lands of SFF and on 7 thousand hectares beyond SFF (on the land of AO). This is a considerable contribution to the implementation of NAP of Kyrgyzstan, since during TSED project implementation period the area of forestation will be increased almost twice. Due to insufficient supply of firewood and timber, local population has certain knowledge and is rather actively engaged in cultivating fast growing (poplar, willow), draught-resistant (elm) and fruit wood species (apple, pear, apricot, plum) at their gardens. This fact will considerably facilitate the implementation of TSEDP.

The lands of the state forest fund located all over the republic where there is natural forest. The lands adjacent to the forest and not covered with the forest are also included into the forest fund. The LHs are state structures located at the land of state forest fund and mainly performing activities on protection of the forest from illegal deforestation, fires and forest pests (forest diseases), on reforestation and small-scale sanitary deforestation (felling of old trees, trees damaged by the wind, avalanches and harmful insects). Due to the fact that various types of forest (spruce forest, walnut and fruit forest, pistachio, almond, juniper, flood-plain forest) depending on climate conditions of mountain country grow in small quantity all over the country (along the flood-lands and mountain slopes), accordingly, the LHs are located all over the country too. There are 42 LHs, 9 forest areas with independent balance, 1 forestry hunting area in the country at the moment (for convenience, hereinafter all of these entities referred to as LHs). In spring 2008 forestry enterprises (LHs, forest areas, parks) in KR planted and seeded forest on the area of 3,021 ha. However, it should be noted that limited financial resources of LHs do not allow achieving adequate level of plantation survival (more than 70%). A brief analysis of the main obstacles to successful reforestation activities by LHs are presented in [Annex G](#).

Altitude zoning is the main pattern that defines the distribution of soils, plants, wildlife and landscapes in Kyrgyzstan; detailed description is given in [Annex H](#). The entire republic is potential project territory, i.e. selected for reforestation land areas are located practically in all regions that have different local climate conditions. In this view, and with the purpose to improve planning and accounting of forest plantation works it was reasonable to group the territories by partners participating in the implementation of TSEDP (ARIS, LHs) and by project wood species (fast-growing, slow-growing).

TSEDP - Analysis and recommendations

² Simultaneous stock-taking of State Forestry Fund of the Kyrgyz Republic, Volume 1, Book 1, Composite materials in the republic. Abdykaimov M. E., Murzaev K., Bishkek, 2003.

³ Community-based forestry is based on participatory work on forest use, forestation, revegetation by economic associations and societies, by families and individuals, organizationally founded based on kindred and family relations, compactly living on the territories of state forest fund or nearby. Community-based forestry is implemented by means of transferring of plots of forestry fund to be used on long-term basis.

The distribution of forest wood species plantations area between ARIS and LHs is given in table 2.

Table 2

Distribution of plantation area broken down by species between ARIS and Forestries

Wood species	Total, ha	Land Type	
		Lezkhozes/ PPP, ha	Aiyl Okmotus, ha
Poplar	6250	1250	5000
Fruit trees	790	10	780
Willow	380	210	170
Elm	500	300	200
Total, fast growing	7920	1770	6150
Spruce	2000	2000	
Juniper	1000	1000	
Pine	500	500	
Walnut	250	120	130
Pistachio, almond-tree	1000	1000	0
Saxaul	1000	1000	
Other	280	280	
Total slow growing	6030	5900	130
Total	13950	7670	6280
Percent	100%	55,0%	45,0%

The TSEDP seeks to establish fast-growing plantations, such as poplar, orchards, elm and willow on the area of 7920ha, of which currently and area of 6,150 ha lands that are unused and unsuitable for agricultural production (low-productive, marginal land) of RFL lands. Selected composition of species is optimal for natural and climate conditions of Kyrgyzstan, while the legal, institutional and social and economic conditions provide the grounds to assume that comprehensive support will be provided from the part of public agencies, local self-governance bodies and the population to forestation activity. The distribution of planned plantations broken down by years is given in [Annex J](#).

According to consultations with LH specialists, weeding is essential for plantation establishment and high survival rates of plantations. Forestry specialists reported that ideally, the practice is that it is required to clean the area from weeds 5 times during a season for up to 4 years. This is made manually. However, in practice this is made not more than 2 or 3 times due to the lack of funding. If there is a necessity to treat the area 5 times during a season, TESD project has to find the way to provide enough means for this important work.

Heterogeneity of forests within the structure of species, ecological and economic meaning defines specificity of Kyrgyz forests and requires a special approach in realization of economic and protective actions in each particular forest growing zone. Effective forest protection is possible only under usage against pests a complex of methods, i.e. system of forest protective

actions including different methods and tools mutually complementing and successively replacing each other. By principal of action and technology of application of actions this is forestry, physical and mechanical, biological and chemical methods.

Water Resources and Water Use (relevant for component B)

The KR possesses considerable water resources: about 44 km³/year of surface river flow, 13 km³ potential underground water resources, 1,745 km³ of lake water and 650 km³ are concentrated in glaciers⁴. Water resources are concentrated in the country's mountain regions and generate numerous rivers flowing towards Kazakhstan, Uzbekistan, Tajikistan, Turkmenistan and Sindzhan-Uigur province of China.

There are five main river basins in the country; they cover about 75% of the country's territory and their combined volume of annual average runoff is approximately 97 percent of Kyrgyzstan's total. Water from melted snow and seasonal and eternal glaciers are the main sources that feed the rivers. Seasonal and annual runoff fluctuations are observed in the basins depending on weather and climate controlling precipitation and snowmelt. The KR has developed a national hydrographical report under UNEP (implementation assistance of Johannesburg plan of implementation of 2006 – "Plans (2005) on integrated water resources management and water safety" (<http://www.cawater-info.net/library/reports.htm>), information from this report on river basins on the KR is provided in Table 3.

Table 3: Main river basins of the KR

River basin	Annual average runoff, billion m³ total basin (including all riparian countries)	Basin area, km² in KR	Annual average runoff, billion m³ total in KR	Water intake limits of the KR billion m³ (% from total in KR)
Syr Darya	37,2	99,458 (Jalalabad, Naryn, Osh)	27, 40	4,88
Amu-Darya	79,28	7,700 (Osh)	1,930	0,42
Chu	6,64	14,154 (Chui, Naryn)	5,00	3,85
Talas	1,84	7,640 (Talas)	1,740	0,83
Issyk-Kul	4,65	15,738 (Issyk-Kul)	4,650	1,56

Source: 1983 Minutes of inter republican division of Chu, Talas, Syrdarya rivers flow

Kyrgyzstan uses only 23% of its available water resources, of which 90% are used for irrigation. The area of the irrigated lands in Kyrgyzstan is estimated as 1.04 million ha, at that, 0.85-0.91 million ha/year are actually irrigated. Water intake from water sources of the KR makes up 7,888 million m³, including 4,135 million m³ for irrigation and agricultural use.

TESDP – Analysis and Recommendations

It is envisaged in the process of TSED project implementation that forest plantations of fast growing wood species will be established on irrigated lands (mainly low-productive and marginal agricultural land redistribution fund).

⁴ Draft Water Strategy of the Kyrgyz Republic, Bishkek, 2003

Norms for irrigation of fast growing plantations and orchards;

In Osh, Jalalabad, Batken oblasts on average 7,800 m³/ha per year with six irrigations per year:

1. March, April: 800-1,000 m³/ha
2. May 1-10: 1,000-1,200 m³/ha
3. June 1-10: 1,200-1,400 m³/ha
4. July 20-25: 1,400-1,600 m³/ha
5. August 1-10: 1,400-1,600 m³/ha
6. September 20-30: 1,200-1,400 m³/ha

In Chui, Talas, Issyk-Kul, Naryn oblasts on average 4,500 m³/ha per year:

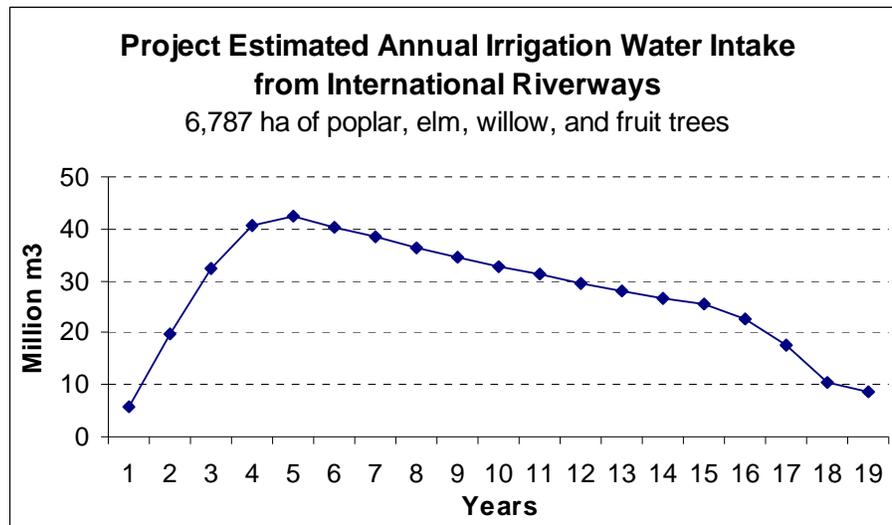
1. April 1-10: 800-1,000 m³/ha
2. May 15-30: 800-1,000 m³/ha
3. June 20-30: 800-1,000 m³/ha,
4. August 20-30: 800-1000 m³/ha
5. October 1-10: 800-1,000 m³/ha.

For calculations the average indicator of 8,000 m³/ha per year for the timeframe of 15 years, was used for the southern part of the republic and average indicator of 5,000 m³/ha per year for the timeframe of 15 years was used for northern part of the republic taking into account of water losses while transportation. Annual average water intake for irrigation of plantations of fast-growing species is expected to make up about 50 million m³ per year. About 0,09 % of water from total the annual river flow will be used for irrigation purposes.

The WB safeguard OP7.50 requires notification of affected riparian countries if a project potentially affects the hydrographical properties of a transboundary river, such as Syr Darya, Chu and Talas. Moreover, Kyrgyzstan is required under regional water sharing treaties to coordinate amount of annual water intake for the plantations created under the project, with Kazakhstan, Uzbekistan, Tajikistan.

Table 4: Estimated Irrigation Water Requirements affecting International Waterways

River basins	Plantation area of the Project (ha)	Annual irrigation water requirement* (m ³ /ha)	Project maximum annual water intake (million m ³ /year)	Total River flow (billion m ³ /year)	Project intake as share of total river flow
a	b	d	c	e	c/e
Syr Darya	2,854	8,000	22.8	37.2	0.06%
Chui	2,666	5,000	13.3	6.64	0.20%
Talas	1,267	5,000	6.3	1.74	0.36%
<i>Subtotal basins on International Waterways</i>		6,787	42.5		
Issyk-Kul (national basin)	1,133	5,000	5.7		
<i>Subtotal forestation with irrigation</i>		7,920	48.2		
Forestation without irrigation	6,030				
Total	13,950				
* Including delivery losses					



The current condition of irrigation and drainage systems must be characterized as unsatisfactory on majority of indicators. Major share of the irrigation assets is at the breaking point of deterioration, due to the fact that during the last 10 years irrigation infrastructure was operated practically without capital investments for repair and / or modernization. Thus, in project areas where fast growing wood species plantations are planned, which require irrigation, there likely will be the necessity to execute small construction works for rehabilitation, or on making small sections of irrigation network to irrigate plantations. It should be taken into consideration that the KR it is implementing a WB project on rehabilitation of irrigation networks, which aims to bring the efficiency coefficient of irrigation networks up to 0,7-0,8. This will significantly decrease water loss and will create added water capacities, which may be used for TSED project.

Pasture

Pastures make up 86 % of all agricultural lands in the KR and cover total area of 9.2 million ha, including winter pastures (2.1 million ha), summer pastures (4.1 million ha) and spring/autumn pastures (3.0 million ha). The rural population is heavily dependent on these pastures. Traditionally, pastures were used in the system of free roaming stockbreeding. During summer livestock grazed high in the mountains, where productivity of pastures was high. Then, during autumn period they moved to the pastures located lower and back to valleys for winter time. Currently, free roaming stockbreeding is not used as it was before due to remoteness, deteriorated pasture infrastructure and high transportation cost; the animals graze all year round at close winter pastures thus contributing to severe overuse and degradation, while the more remote summer pastures are underutilized. New Law of the KR “On pastures” will allow recommencing pasture turnover and use pasture resources more rationally.

SOCIAL SURVEY

General information

The objectives of the social survey conducted in selected villages in the KR and RK were the following:

- assess the relationship between natural resource use and local communities
- determine the importance of forest resources for livelihoods
- evaluate current social and economic conditions, including a baseline for poverty and other social and economic indicators
- identify environmental and social risks of project impacts

- arrange consultations with all the stakeholders and communities in order to evaluate the opinions and recommendations of local communities on the TSEDP
- develop recommendations for project implementation, preventive and minimizing measures for potentially negative impacts.
- identify possible alternative types of activities for the population to reduce poverty level.

Detailed information of the social survey is described in [Annex K](#). Methodological instruments of the survey included in-depth interviews, focus group discussions, expert interviews and desk reviews. The participants represented equally all groups of the population and the society, including equal gender representation, rural intelligentsia, farmers, lessees, unemployed, public servants, NGOs, businessmen and housewives took part in the survey. Thus, expert analysis was supported by the opinions expressed by the respondents during focus-group discussions and interviews with the representatives of local administration, researchers, LHs and national parks' specialists, NGO and business representatives.

The social survey results were obtained based on analysis of opinions expressed by the respondents during focus groups and individual interviews with the representatives of local administration, experts, LHs, national parks' and reserves' specialists, the representatives of NGOs and business, during the discussions at the meetings with community members.

Survey's Conclusions and Recommendations

Conclusions

The social survey results show understanding and concern of the local population about environmental problems, forest exploitation, pasture degradation, salinization and water-logging processes, and an increasing areas of degraded and non-arable lands. According to the study, each AO and Akimat possesses degraded, non-arable land unsuitable for reclamation. Further, the analysis indicates that poverty reduction and the provision of alternative livelihood sources can directly address environmental problems and promote sustainable development. Poverty is one of the main problems causing deforestation and forest degradation. High price for traditional energy sources such as coal and gas which considerably increased the demand for cheaper or free source, such as firewood. Lack of protection on forest plantations and orchards on former Kolkhozes and Sovkhozes land has led to increased fuelwood exploitation and led to extensive forest degradation of forest resources.

Specific outcomes and relevance for TESDP:

- 48% of respondents from Batken, and 9-12% of respondents from Southern Kazakhstan, Jalalabad and Chui identified soil salinization as the most acute problem.
- Forest dwellers in the Walnut-Fruit Forest consider logging of the forest as the main problem.
- Resident of those settlements that are located at the territory referred to anthropogenic ecosystem mention salinization and water logging processes that cause full unsuitability of agricultural land that, however, could be successfully used within the frame of TSED project to create plantations of fast growing tree species.
- 0-70% of respondents buy firewood currently.
- Rural people cultivating trees to satisfy their own needs for firewood and timber do not encroach forest resources; the more trees are grown by the villagers, the less damage people cause for the environment.
- **Conflicts over natural resource use** between rural residents mainly emerge in relation to pastures, water and forest. At the same time it should be noted that upon the implementation of proposed project the risk of aggravation of these conflicts appears.

Thus, the conflicts may emerge due to expansion of the area of forest plantation, since it may cause certain reduction of pastures area, which will directly impact the interests of pasture users. There is a risk of conflict between the two main groups. This is the group of pasture users who are striving to increase pastures area due to the fact that from year to year the number of animals increases. On the other hand, there are interests of villagers wishing to deal with forest plantations creation. The livestock will be the main threatening factor for the plantations, which means that the interests of forest growers will be impacted too. Partially, this may also be relevant to haying. At that, as the survey results have shown, these are the lands in the vicinity of the settlements of common use. So, **selection of land plots for forest plantations requires special grounding**. It should exclude the risk of damaging anyone's interests and conflict emergence. The search of compromise settlement of potential conflicts is seen in conducting wide awareness and education campaign, involvement of rural residents into the discussion and development of preventive measures, forest plantation management with the participation of not only groups of pasture users, but also the stakeholders interested in creation of forest plantations. It is also necessary to develop additional measures for pasture users – allocation of alternative land, arrangement of grazing on outrun pastures, installation of fences, provision of funding and etc.

- There is also a risk of conflicts due to shortage of the irrigation water, especially at those places where conflict level is high currently. To eliminate conflict situations under the implementation of proposed project it is feasible to establish public “water committees” composed of farmers, public associations’ representatives, NGOs and etc. apart from local administration representatives.
- The overwhelming majority of respondents sees the solution in attracting local communities to natural resources use management, establishment of special structures to coordinate activities and to develop practices of rational use of all types of resources. Both methods of natural resources use, and the implementation of protective measures for natural objects from negative man-caused impact depend on local communities. Involvement of local communities to nature resources management, establishment of the committees, which together with local administration participate in the management and jointly find the ways for rational use of all resources, may improve the situation. It is feasible to disseminate this experience for project area.
- To increase the number of people dealing with cultivating trees for commercial purposes. This business is considered profitable and very profitable by about 70-80% of the surveyed in Kyrgyzstan and very profitable by 87-100 % - in Kazakhstan.
- About 20-25% of respondents did not wish to cultivate trees due to the lack of fences. There are land plots, but those are not enclosed and that is why people do not want using them to plant trees.

Recommendations

According to the outcomes of the social survey it is recommended to involve local communities in natural resources management, to reduce potential negative project impacts; to identify possible alternative types of activities of the population to reduce poverty level. The following activities are proposed:

Measures aimed at increasing the area of the new plantations

Degraded land unsuitable for reclamation, including degraded pastures could be successfully used within the frame of TSED project to establish fast-growing plantations and orchards.

Actions aimed at capacity building of the LHs, rural people and natural parks

1. To enhance the capacity of active nursery forests of the LHs to produce bigger volume of the young plants. Capacity building and training of the personnel of nursery forests and national parks on marketing and advertising of products are required for successful competitive operation of nursery forests of the LHs.
2. For rural residents interested in cultivating orchards and fast-growing wood species plantations trainings needs to be arranged during the first year of young plants cultivation. This would allow to increase the number of survived young plants and to reduce the costs.
3. To support establishment of private nursery forests of fruit and fast-growing wood species. Currently existing nursery stock is insufficient. According to the respondents, it is not enough planting stock of guaranteed quality to satisfy the demand both in Kyrgyzstan, and in Kazakhstan. The number of private nursery forests is small; currently there is great potential for their development.
4. To support planting of fruit trees and fast-growing wood species by interested rural population at their land plots. The data given above is evidence that upon favorable conditions volume of wood species cultivated in the land plots may be increased.
5. To reduce losses of young plants when planting (these losses make up about 50%) due to the lack of knowledge of planting rules for both fruit and fast-growing wood species by conducting special training for interested rural population. To consider features of the area when developing measures (salinization, closeness to the forests, level of conflicts and etc.). To introduce limitations for grazing in the area adjacent to the settlements for the owners of large number of livestock (and goats in particular).
6. To envisage use of fencing for the new plantations. This is also an obstacle for afforestation and reforestation.

Measures aimed at enhancing the legislation

1. To combat illegal commercial logging through enforcement of the legislative acts providing for responsibility for illegal deforestation.
2. To involve organizations (LHs, nurseries) and law enforcement agencies to toughen control over deforestation and sanitary felling with the objective of further sale.

Measures aimed at public involvement into the management

1. To involve interested rural population groups to plantation management (local jaamats, NGOs and etc.)
2. To involve the stakeholders into the measures on environmental monitoring.
3. To draw public attention through mass media to the problem of illegal deforestation (denouncing illegal deforestation in the forests and in the forest belts), to encourage cultivation of the young plants, plantation and etc.
4. To inform rural population at village meetings on the results of spontaneous felling monitoring and on project activity aimed at the restoration of the forests and forest belts and fruit trees plantations.
5. To develop education programs (trainings, workshops, round tables).

Measures aimed at the development of new activities

1. To develop new activities aimed at increasing income and poverty reduction. Poor population is the greatest potential threat due to the fact that they use illegal deforestation as the livelihood
2. To provide young plants for planting, to advice and to facilitate sales of grown plants and etc. for poor rural citizens.

3. TASK and 4. TASK

Potential social and environmental impacts (positive and negative) of proposed project activities, including potential restrictions of access to natural resources were identified. Among other potential negative environmental and social impacts a possibility of negative impact from planting poplar is noted; in particular, almost all species of poplar are divided by sexual character; male poplar pollen is falsely considered as a common reason of seasonal allergy however according to scientists of National Academy of Science this consideration is wrong. It appears that seed hairs produced by female poplar make people feel uncomfortable due to the presence of allergenic pollen trapped in the hairs. Thus, female poplars cause allergies.

Mitigation measures have been identified and developed to address negative environmental and social impacts, revealed for project activity that include recommendations on possible and economic effective measures on prevention or reducing of any important unfavorable impacts on environment as much as possible.

ENVIRONMENTAL IMPACTS

ANTICIPATED POSITIVE IMPACTS

Improvement of SPT management and raising awareness of local population

Dissemination of the information on the necessity and ways of biodiversity conservation will update knowledge of all layers of the population on importance of natural ecosystems in terms of enabling environmental sustainability as necessary basis of environmental and social and economic development. Environmental awareness will be raised, along with the knowledge on the ways and opportunities of various layers of the population to participate in biodiversity conservation. In addition, raising environmental awareness through the dissemination of environmental information among the population will enhance responsibility and provide opportunities for the staff dealing with environment protection to work with the population.

Positive environmental impact will be related to improvement of protective measures and social impact due to creation of better working conditions. Provision of SPT with equipment and transport will meet the most urgent requirements of SPT and will allow improving environment protection in SPT and in adjacent territories. Positive impact is anticipated on the condition of protected natural ecosystems and its components, and in particular in terms of prevention of illegal grazing, poacher's cutting and shooting (catching) of some protected species.

Improvement of SPT operation from training on management plans

Training on preparation of management plans will allow using available SPT resources more rationally to effectively organize protection, identify priority objects, conduct monitoring, and improve SPT management. In addition, trainings will allow training SPT staff on methods of cooperation with local population and attracting additional investments to improve SPT operation. This will also have positive impact on the condition of natural objects in SPT and adjacent territories.

Creation of habitat for biodiversity

Restoration of natural forests will have great positive environmental impact on biodiversity conservation, and on stabilizing environmental situation as a whole. Newly created plantations will contribute to the creation of habitat for the development of biodiversity, and in particular of some birds' species. Location of fast growing wood species plantations along the banks of watercourses (canals, small rivers and etc.) will contribute to enhancing local biodiversity.

Combating erosion and water use

Restoration of forest plantations will facilitate reduction of the degree of water and wind erosion. Creation of anti-erosion and wind protection forest belts using ecosystem approach will also facilitate reduction of the rate of water and wind soil erosion, as well as water logging that is caused by the deterioration of drainage systems. Restoration of natural forests will improve general environmental situation, will facilitate strengthening of slopes, regulating and increasing of water content and sustainability of water bodies. Placement of fast growing wood species plantations along the banks of watercourses (canals, small rivers and etc.) will contribute to strengthening of the banks. Partial rehabilitation of the irrigation infrastructure will allow reducing water losses when the water is supplied for the irrigation.

Stabilizing of areas with geotechnical hazards

Forests restored on the mountain slopes will facilitate stabilizing of areas with geotechnical hazards, especially unstable and erosion prone slopes. Root systems of trees and shrubbery planted as a result of reforestation activity along with the restored grass cover will contribute to strengthening of the slopes, reduction of water seepage and pore water pressures, thus reducing erosion processes, development of ravines and formation of mud flows and landslides. This will significantly reduce the risk of unfavorable impacts on the productivity of adjacent lands.

Climate change mitigation and carbon trading

Reforestation and creation of fast growing wood species plantations will contribute to the mitigation of climate change by increased carbon sequestration through the forested areas created under the project. The development of carbon trading scheme will allow the generation additional income for sequestered carbon for the KR, specific land owners and communities. Income generated from sale of certified carbon in the KR will facilitate enhancing of the capacity of the SAEPP, AO, direct participants of the project and will be conducive to the dissemination of this experience in the region.

Creation of alternative utilization concepts for natural resources

The development of eco-tourism in SPT will have positive environmental impact in a view of regulated access, “soft”, low impact tourism and being able to use revenues to support environment protection activities. Additional financial means will have positive social impact by strengthening the SPT’s financial standing, increasing staff payments and benefits and creating revenues for local residents who work within the tourist service sector.

Apart from financial benefits positive impact is also anticipated on the formation of environmental awareness of tourists and local population, on improvement of mutual understanding and enhancing support from the part of local residents, and improving of SPT infrastructure. Eventually, this should have positive impact on the condition of nature in SPT and adjacent territories, including a friendlier attitude of tourists and residents alike to the natural environment, by understanding its value as a resource / asset.

The forestry project components will increase the incomes for the local rural population by revenues from wood and non-wood forest products to be obtained as a result of reforestation. The biggest social and economic benefit for local rural population is anticipated from fast growing wood species plantations and orchards. As a social assessment has shown, about 70% to 80% of rural population depend on firewood for heating and cooking. For the poorer segments of the rural population firewood is the main type of fuel. Average requirement for firewood for the households during heating period makes up about 2 cubic meters for the season.

Fast-growing tree species plantations will facilitate growth of timber for the local market. This will determine more stable pricing for firewood, the price of which may, without the project,

increase disproportionately due to growing demand for this type of fuel. Local population will be able to buy firewood at competitive price and reduced transportation cost. In addition, the community may decide to sell firewood at accessible low prices for those who are in need and to vulnerable groups of the population, for instance, for pensioners, single mothers and mothers with many children and etc.

With the creation of fast growing wood species plantations local timber demand on community level will also be met by increased supply. As social assessment results have shown, annual requirement in timber is more than 4 cubic meters for 40-60% of the rural residents. Much of this demand today is fulfilled by illegal logging in natural forests. Furthermore, skills acquired by locals for plantation and forestation management will increase the chance for generating sustainable income from wooden products for part of the population. In general, this approach should have favorable impact on the condition of natural forests. Positive social impact will be expressed in obtaining additional sources of non-wooden forest products for local population (wild fruit, berries, mushrooms, herbs).

Creation of additional jobs

Project implementation will cause creation of temporary jobs. During the process of consultations with local population many rural residents expressed their hope for creation of additional jobs in a view of implementation of reforestation works. Having big volumes of seasonal works the forestry usually hired local people as temporary workers and paid them either in cash, or in kind (especially with firewood). Job opportunities may emerge to enable the preparation of soil, perform planting works, weeding, thinning, protection and irrigation.

There will likely be some gender specificity, however opportunities for women and men alike in work distribution: for hard labor mainly men will be involved, including works such as excavation, planting, planting stock preparation, minor construction works. Women may be attracted to the work in nursery forests, weeding, collection of non-wooden products, branches in the case of sanitary felling and improvement felling. Appearing of the opportunity to provide wooden products and an opportunity to sell this deficit good and production will create new jobs in rural area and will reduce the degree of forced migration. Sharp reduction of income and the number of jobs in rural area caused mass forced migration to the cities during the last two decades.

Soil quality improvement

In the long-term perspective, forest plantation will facilitate accumulation of organic component, improvement of soil structure and fertility. Restoration of forest vegetation facilitates mitigation of reduced productivity of adjacent arable lands, moistening of soil and creation of more favorable hydrological regime of the soil. Among potential project areas there are some, where high water table causes problems of water logging and soil salinization (Chui, Talas, Batken oblasts). Creation of fast growing wood species plantations at the areas with high water table and secondary salinization will lower the groundwater table, support the reduction of salinization, the opportunity to seed perennials in row-spacing, on adjacent areas of the most crops sensitive to salts, which also will prevent soil erosion and will raise agricultural productivity of soil.

CLIMATE CHANGE IMPACT ON FOREST ECOSYSTEMS

Another important set of positive impacts is related to climate change. The project will facilitate both climate change mitigation (through sequestering carbon in the trees in the form of cellulose), and climate change adaptation (reduction of temperature rise impact and water shortage impact due to increasing of the capacity of snow and water accumulation). According

to climate change scenarios, the following changes may be anticipated for various types of forests.

Spruce forests

Upper and lower limits of spruce prevalence will not change significantly. By 2100, fullness of the forests will increase up to 0.5-0.6. This change will not be the same everywhere, which is related to different moisture content and different degree of heating of mountain slopes. At the altitude 2,000-2,200 m with moisture deficit and considerable amount of heat, spruce will occupy only northern slopes, at that, the area of spruce forest will make up just 5.2% from total plantation area. At the altitude 2,200-2,600 m spruce forests will occupy not only northern slopes, but also western and eastern slopes. Here, 37.2% from total forest area will be concentrated. At the altitude 2,600 m and higher the density of the forests will sharply increase in a view of considerable increasing of the amount of heat received at these altitudes. High moisture content and increased amount of heat will facilitate further expansion of forest area and appearance of spruce at southwest slopes. At the altitude from 2,600 m and higher up to the limit of forest vegetation the forests will occupy 57.7% from total area. Within these altitude limits spruce prevalence will coincide with sub-belt of sufficient moisture. In the upper part of the belt, at the altitudes from 2,800 to 3,000 m, with significant forest area (27.2%) it may grow at shaded northern and northeast mountain slopes. Rather poor natural restoration of spruce forests is related to its age structure, biological features and forest vegetative conditions.

Juniper forests

As a result of rising of the sum of positive temperatures by year 2100, in the belt of juniper forest a shift of ecological belts of juniper forests limits may occur for each specimen of juniper (Zaravshan, semi-spherical and Turkestan juniper), each of which occupies its altitude zone. Thus, with increasing the sum of positive temperatures from 210°C at the altitude 2600 m above sea level to 462°C at the altitude 1600 m above sea level and with the duration of vegetation period from 33 to 40 days, the prevalence of all species of juniper will rise by 150-200 m altitude. Nevertheless, presumably the area of juniper forests by 2100 may slightly reduce in a view of high prevalence of diseases and low yield of seeds (non-climatic factors).

Walnut-fruit forests

At the altitudes 1,400-2,300 m in southwest region with sufficient moisture content rising of bioclimatic productivity may occur. In dry steppe and semi desert regions at the altitudes 800 - 1,400 m above sea level (pistachio savanna forest and almond forest) bioclimatic productivity will not practically change, while under the impact of anthropogenic factor it may even reduce. In general, walnut could go up by 100-150 m due to the rise of a sum of active temperatures by 4-8°C, increasing of moisture content and duration of vegetation period by 30 days, if to exclude impact of age structure (ripen and overaged forest area reaches 60%) and anthropogenic impact.

Adaptation measures

Forest ecosystems of Kyrgyzstan under the condition of anthropogenic impact and the rate of recreation may be preserved first of all due to establishing and expansion of special protected territories. By 2100, forests should be restored at the area of 340 thousand ha, which will allow bringing the area covered with the forest up to 6% from total area of the republic. To do so, it is necessary to annually plant forest specimen at the area of at least 3.4 thousand ha. With the objective of sustainable preservation of forest ecosystems it is necessary to arrange inventory of specific and intraspecific diversity based on single methodological approach and developed method of assessment of forest genetic resources. Poverty reduction of the population is one of the main ways to provide preservation of forest ecosystems, as well as improvement of natural resources management. Participation of local communities in the decision-making in terms of access to forest resources based on community forest use is required. Additionally to the measures on preservation and expansion of natural forest ecosystems it is reasonable to develop

practices of cultivated plantations, for instance, industrial plantations of poplar (more than 1 thousand ha annually).

POTENTIAL NEGATIVE IMPACTS AND RECOMMENDATIONS ON PREVENTIVE OR MITIGATION MEASURES

Potential negative impacts

Mainly for Component A:

1. Impacts from small-scale construction works at specially protected natural areas (improvement of roads, reconstruction of buildings, irrigation constructions etc.).
2. Management of solid waste and wastewater

Mainly for Component B:

3. Increased competition for irrigation and increased competition for obtaining access to irrigation infrastructure
4. Long-term demand for irrigation in areas with scarce water resources
5. Negative impact for soil quality under preparation of areas
6. Increase of fire hazard.
7. Non-regulated usage of fertilizers, pesticides and herbicides
8. Access to pasture areas, reduction of existing pastures
9. Allocation of project benefits between the stakeholders
10. Allergic risks
11. Effects on cultural objects (nature relicts, sacred places)

1. Impacts from small-scale construction works at specially protected natural areas (SPNA)

Potential Negative Impact

Construction works planned under the project include e.g. strengthening of irrigation infrastructure for the rehabilitation of on-farm (tertiary) canals and drainage systems. All construction works will be designed and performed according to engineering practices and should be guided by the relevant standards on environment protection existing in the Kyrgyz Republic. To perform these works heavy machinery will be required (i.e. excavator, bulldozer), but the works to be done at the area used for agricultural purposes will be small. The main effects of construction works may be the following: generation and disposal of dredged material and construction debris and (i) temporary obstacles for access and traffic; (ii) obstacle to agricultural activities as a result of access limitations, earthworks; (iii) generation of waste, noise, emissions, mud and dust at the sites and roads; (iv) damage caused to trees or other vegetation planted along canals and (v) damage caused to nature at the sites located closely to environmentally sensitive zones.

Due to long run effect there may be possible destruction of irrigation canals, roads and other engineering constructions with the roots of growing trees (this should be considered at the stage of designing) and intensification of transpiration from the ground waters under mass plantation of trees in the zone of high water table. There are possible negative environmental effects caused by intensification of concern factors in SPNA and neighboring zones due to tourism development, additional road construction, and the infrastructure (improved paths, parking lots and etc.).

The number of tourists visiting SPNA in 2007 amounted to about 15,500 people in RK and 20,000 people in the KR. These numbers show a clearly growing trend. Strengthening SPNA capacity and implementation of Small Grants Program under TSED Project may increase the number of tourists what may result in construction of extra roads, infrastructure, parking places, well-equipped paths, stopping sites, bill boards etc.

Recommendation on preventive or mitigation measures

In environment assessment it is given a recommendation on adoption of combined preventive actions and monitoring to minimize potential effects caused with realization of construction works described above. First of all it is necessary that all contractors prepare plan – guideline on environment protection especial for each object where it would be described in detail suggested measures for prevention or softening of construction effects on environment protection. Instruction on preparation of such plan – guidelines on environment protection is submitted in [Annex L](#). Inter alia, in the plan – guideline on environment protection especial for each object, it is necessary to state if irrigation scheme covers area of small irrigation dam or reservoir that World Bank policy on safety measures is not applied. Those irrigation systems that are in the risk zone must follow special instructions developed for such purposes (see Annex C. OP / BP 4 /01). These plans – guidelines on environment protection especial for each object will be studied by the SAEPF for meeting requirements of state ecology expertise, before financing or construction of this irrigation system.

Secondly, all contracts for performance of construction works must meet standards on environment protection, health and safety required by the legislation of the KR and World Bank procedures. These two preventive measures will prevent any potential unfavorable effects of rehabilitation works. Within the framework of TSED Project implementation it is important to develop a tourism concept and tourism strategy in specially protected areas and to apply them within the framework of implementation of Small Grants Program.

2. Management of solid waste and wastewater

Potential Negative Impact

There is a possibility of increasing pollution of water resources (ground and underground), as treatment facilities of discharge water and sewage systems exist only in big cities (Bishkek, Osh, Karakol, Naryn etc). The increase in tourist numbers and the absence of sewage collection and treatment systems and facilities may cause pollution. Existing practice of septic tanks and sewage pits cannot be considered proper decontamination and processing of wastewater (approximately 20% of fresh water) and sewage discharges.

Recommendation on preventive or mitigation measures

In view of unavailable information related to existing and possibly increased volumes of flows caused by increased number of tourists in SPNA it is of need to develop a simple monitoring program to produce accurate estimates of waste and sewage generation and the current management situation. For reducing the risk of increasing pollution of water resources (ground and underground), concerned with increasing flow of organized tourists and absence in rural areas of canalization systems and treatment facilities of discharged water, it is required observance of existing ecological and sanitary norms and rules under commissioning of tourist sector infrastructures. SAEPF jointly with local AOs are realizing control and responsible for environment condition at corresponding area. TSED project in realization of the Component MGP stresses on observance of ecological and sanitary norms and rules by all potential beneficiaries that obligatory reflects in granting applications for realization of tourist activity.

3. Increased competition for irrigation and increased competition for obtaining access to irrigation infrastructure.

Potential Negative Impact

While creating plantations of fast-growing tree species in areas with existing shortages of irrigation water there is potential for increased competition for the irrigation and possible growth of competition for access to irrigation resources. The results of social survey show high level of

conflict caused by irrigation water use. There is also a risk of conflict caused by lack of irrigation water especially in the areas where the level of conflict is high at the moment (Talas, Chui, Batken regions).

Recommendation on preventive or mitigation measures

For elimination of conflict situations under realization of proposed project it is reasonable a collaboration with public Association of Water Users (AWU), into which in addition to representatives of local administration, farmers, public organization participants of TSED project, NGOs etc should enter. After consultations with local AOs, communities and AWU, irrigational quotas should be identified and a sequence established for watering of quick growing species plantations. There will be obligatory trainings on agrotechnological skills relating to the selection of species within specific climate conditions and selection of corresponding methods under site preparation, planting, watering and taking care of them. Measures on mitigating the additional water demand and for ensuring sustainability will be jointly specified by all stakeholders in the process of identifying potential project areas.

4. Long-term demand for irrigation in areas with scarce water resources.

Potential Negative Impact

Similarly, the long-term demand for irrigation may cause or aggravate problems in areas with scarce water resources, in particular during periods of droughts. This in turn also presents a risk for the sustainability of the established plantations.

Recommendation on preventive or mitigation measures

Irrigation methods and management will be adjusted to specific climatic, hydro(geo)logical and soil characteristics of the site, as well as to discrete phases, such as preparation of the site and planting period. The selection of plant species and forest types appropriate within natural and climate conditions and selection of corresponding methods in preparation of the site and during planting will exclude long run demand for water in order to maintain plantings. TESDP Project will ensure with necessary training programs on agro-technologies of planting for personnel of forestry.

5. Negative impact for soil quality under preparation of areas.

Potential Negative Impact

Soil preparation (e.g., ploughing and furrowing) for establishment of fast growing plantations in the irrigated areas can lead to an increase in soil erosion. However, such effects will be short-term and insignificant as the project envisages seeding or natural regeneration of grasses between rows. As in most cases project activities foresee the forestation of fast-growing species on already degraded and in many cases eroded land, the new ecosystem of trees and grasses will in fact contribute significantly to erosion control and soil reclamation in the long term. For slow-growing species, soil preparation will be manual (e.g., digging holes) and only 4-10% of the total area of will be processed mechanically, while the surrounding area and existing vegetation will not be removed. Once during plantation establishment, the renovation of irrigation networks, transportation and machineries may have negative impacts on soils such as through compaction, however this impact is short-term and considered insignificant.

Recommendation on preventive or mitigation measures

The main measures on reducing ecological risks for negative impacts on soil are the minimization of soil disturbance during site preparation, by applying techniques for conservation tillage, the seeding of forage and permanent grass vegetation or their natural regeneration. Potential risks during plantation establishment should be minimized by monitoring and coordinating the relevant work, including the work of contractors.

6. Increase of fire hazard

Potential Negative Impact

The risk of fire hazard is relevant for the of their occurrence in southern regions during hot and dry seasons, due to several factors, such as uncontrolled fuel-loads, careless handling of inflammable substances, ecological conditions etc.

Recommendation on preventive or mitigation measures

This risk can be effectively minimized by introducing and promoting fire management standards for plantation management and protection in the relevant areas. Moreover, the introduction of proper handling of wastes (e.g. kerosin) can reduce the fire risks. Based on the risk assessment by field groups, fire breaks and appropriate monitoring responsibilities by project participants will be established. In addition, training programs and awareness raising for local population can present an effective mitigation measure.

7. Non-regulated usage of fertilizers, pesticides and herbicides

Potential Negative Impact

In order to ensure effective weed control, the TESDP allows the use of Glyphosate (Roundup) and Simazine in combination with manual weeding for coniferous species. Fertilizer and pesticide application will be limited to nursery purposes and will be strictly controlled by the PIU. There are risks of negative impacts on soils, water (including surface, ground, underground and fresh water sources) and health of rural population and staff due to improper handling and use of chemical substances.

Recommendation on Preventive or Mitigation Measures

The ESA recommends a combination of preventive measures, such as trainings, and monitoring to reduce potential negative impacts of herbicide or fertilizer use.

The KR applies FAO Guidelines on usage and application of pesticides and stimulation of integrated control under plant pests. Department on plant protection (under the MAWCRI) distributed regulations on safety usage and storage of permitted for usage pesticides and provides services on training, licensing and regulation of pesticides usage within Stockholm Convention and FAO Guidelines. Due to the absence of specific national regulations, FAO guidelines will be applied to any project investments, within which procurement, distribution or application of pesticides or herbicides is envisaged.

Competent and efficient application of herbicides requires training seminars for forestry specialists dealing with transportation, storage and application of herbicides. Training on proper handling, storage and application of herbicides should be provided by specialists of Chemicalization & Plants Protection Department under Ministry of Agriculture, Water Industry and Processing Industry. See training programme in [Annex M](#).

TESDP will ensure conducting of corresponding trainings for forestry personnel and project participants on creation of plantations of quick growing wood species, on training of integrated fight with pests and other progressive forestry practices. In nurseries for growing planting material it will be using technologies and methods excluding or minimizing potential damage effects on environment. For decreasing of man-hours at maintaining (weed control) of different types of forest plantations it is recommended by international consultants to apply herbicides tested in laboratories and field conditions. Such description of recommended herbicides and training program are given in [Annex M](#).

Pursuant to OP. 4.09 of World Bank upon evaluation of the project dealing with pest control the team carried out the assessment of legal & regulatory base of the country and ability of system of regulating authorities to organize and sustain a reliable, effective and environmentally rational pest control. Legal & regulatory framework regulating application of herbicides is given in [Annex B](#). It should be noted that herbicides to be applied within the framework of the project belong to the Class 4 and access to their application is not restricted in the country.

8. Access to pasture areas, reduction of existing pastures

Potential Negative Impact

Although minimized by project design as well as certain provisions for social mobilization, selection of sites and participants, for all reforestation activities envisaged by component B and implementation schemes, there is a risk for negative socio-economic impacts.

The TESDP will establish plantations of fast-growing species and orchards on 6,150 ha of irrigated lands of agricultural LRF. Land formally designated for pasture use is excluded from the project, and it is assumed that the irrigated lands of the LRF are currently either barren, degraded or used for marginal grazing, if any, by local people. Still, assuming that the LRF land was used for pasture and without assuming any distinction for pasture productivities (e.g., marginal versus high-productive pasture), the LRF area to be afforested would be equivalent to 0.07% of the total area of pastures in the KR. Therefore the reforestation would have a negligible impact on the livestock sector, though it may concern the interests of local livestock holders.

The area to be reforested during the first year of project implementation is small, and will therefore in combination with the experience from currently implemented pilot activities allow local AOs and ARIS to test and evaluate mobilization, awareness raising and other procedures relevant for rational land use.

For activities on SFF lands, restricted access and related conflicts could present a risk for reforestation of informal pastures located near the forests. This in particular applies to areas that were deforested during World War II or constantly degraded since then, and are still officially designated as forests, but are now grazed informally.

The results of the social survey showed pastures as the most important source for conflicts between rural people on natural resources. In addition during consultations within the process of preparation of social assessment some rural inhabitants, livestock farmers and shepherds stated a fear of possible access limitations to pastures. Therefore the project could cause an aggravation of and increased number of conflicts.

Recommendation on preventive or mitigation measures

This risk is addressed by the ARPF (see also description, and [Annex D](#)).

9. Allocation of project benefits between the stakeholders

Potential Negative Impact

Social assessment and consultation with rural inhabitants show that local population not always trust official bodies for the allocation of rights and opportunities in natural resource use. Therefore the fair allocation of benefits and revenues from the project activities between project participants, rural inhabitants, natural resource users whose interests may be infringed by project and all interested parts must be regulated by a Strategy of Social Responsibility. From the moment of planning up to the moment of receiving finished product all the rights and

responsibilities must be clearly negotiated between participants of the project (FH, AO, local communities, micro-project groups etc.). Local communities must have equal access along with other project participants to project funds and received benefits. For AOs, the social mobilization process will play an important role in minimizing any potential negative impact.

Recommendation on preventive or mitigation measures

PIU consultants should prepare Strategy of Social Responsibility explaining mechanisms assisting members of rural communities and in particular users of forest resources participating in resource management:

- information and training campaigns for information of rural inhabitants and users of forest resources that interests may be infringed by project activity on their rights in access to project resources and new forest plantings; this can be part of the social mobilization and relevant training processes;
- joint activity on development of plan for decision-making on issues of project resources usage at the local level (for example, by establishment of committees on planning of activities with participation of a number of interested parties);
- development of compensation measures on specific natural, ecological and social conditions of the project realization sites;
- approaches of joint monitoring and evaluation.

10. Allergic risks

Female poplar can store allergenic pollen in seed hairs, and therefore in some cases present a source of allergies. Especially in the vicinity of villages this can have a significant impact on the health of the local population. Taking into account the recommendations of the scientists of the National Academy of Science of the KR, poplar will be propagated from clones of male trees in order to prevent any allergies.

11. Effects on cultural objects (nature relicts, sacred places)

Project activity is not envisaged at the locations of physical cultural heritage, natural monuments or sacred sites, so negative impacts are not expected. This will be confirmed by the field assessment, and by the social mobilization process in AOs.

The Mitigation Plan is described in [Annex N](#).

ANALYSIS OF ALTERNATIVE OPTIONS

“No project” alternative. From economic, ecologic and social points the no-project alternative and subsequent refraining from development and re-forestation of Tien-Shan Ecosystems is not desirable. The high concentration of different nature ecosystems from glaciers to deserts in comparatively small area of Central Asia requires special attention to saving biodiversity of Tien Shan, which is very important from the point of agro biodiversity. Forest ecosystems play extremely important role in protection of biodiversity by providing habitats, reducing water and wind erosion, and carbon sequestration. Forest resources are very important for the economy of the KR and for assurance of sustainability of mountain ecosystems, thus the project is expected to play an important role with clear positive impacts and should be prepared and implemented.

5. TASK

Under this task ecological and social plans are developed for environmental management for project realization concerning monitoring of all key ecological and social indicators and including institutional roles, responsibilities, opportunities of participated interested parties, and requirements to professional experience. Ecological and social plan of management include guideline principals for selection and approval of sub projects with participation of construction works or physical interference in order to ensure ecologically safe planning, placement and practice of construction for project activities.

Environmental Management Plan (EMP)

The EMP of this chapter presents the procedure ensuring environmental prevention and mitigation measures identified within feasibility study what is to be duly applied during implementation period of the proposed project. Also EMP includes the guidelines for environmental selection of project investments, monitoring plan and institutional strengthening actions contributing to positive effects of this project. And finally EMP describes the institutional base for implementation of preventative & mitigation measures and proposes the schedule for implementation of these actions with relevant costs specified in the budget of the proposed project.

Guidelines for Environmental Selection of Investments

The objective of this Environmental Selection Guidelines is to review small infrastructure investments financed under TSEDP in order to reveal and settle (prevent, reduce or eliminate) potential negative environmental impacts. If potential insignificant risks are the case, they will be settled through preventative actions and simple mitigation measures identified within EMP; settlement of more significant impacts is likely to require review of Kyrgyz & Kazakh legislation frameworks and decrees and implementation of specifically identified mitigation measures.

Types of Investments subject to environmental selection: Environmental selection involves the investments supporting the activities connected with immediate environmental effect, impact on biological communities or specific natural valuable objects (specific species etc.), or those with potential environmental risk. Within TSEDP such activities can be investments connected with the impact of small-scaled construction operations, tourism development, reforestation, plantations of fast-growing trees, in particular with increased competition in irrigation, increased fire hazard, non-regulated use of pesticides and herbicides, reduced number of existing pasture lands. Meanwhile, the assessment should deal with methods, technologies and location. Special attention is to be paid to reasonable selection of plantation plots. In order to avoid and minimize infringement of local public interests the selection of plots is to be based on results of consultation meetings with specialists (forestry experts, environmentalists), AO representatives as well as direct users of selected plots.

Application of environmental selection criteria against investments.

The criteria for environmental investments selection aim at minimization or complete elimination of negative environmental impacts of subprojects. They should take account of level of:

- damaged soil & vegetable cover,

- impact on biodiversity (reduced factor of concern, conservation of breeding places and migration ways etc.),
- damaged surface & underground flows (conservation of river basins against pollution, exhaustion etc.),
- water supply for irrigation purposes,
- fire hazard,
- applied chemical fertilizers and pest & malady controlling chemicals,
- reduced pasture lands,
- as well as maximization for use of natural reducing capacities of environment.

PIU (Project implementation Unit) review & approach.

The PIU will ensure an adequate review of all investments on the base of applied selection criteria before approval of investment implementation in the framework of TSEDP. In those cases where application of appropriate best practices, preventative & mitigation measures relating to location, design, construction or management is proposed under implementation of selection procedures, TSEDP will ensure presentation of adequate best practices, actions, measures or training as well as further implementation of those practices or measures during investments implementation. In those cases where pursuant to selection criteria there is a need in further environmental review in the framework of Kyrgyz & Kazakh legislations, the PIU will ensure completion and submission of due forms for SAEFP consideration as well as investments implementation after available approval of relevant bodies. The PIU will provide a complete background information required to facilitate review in SAEFP.

Review & approval in SAEFP.

Pursuant to environmental law the projects with potential negative environmental impact should be subjected to SAEFP-based SEE before their implementation. The overwhelming majority of TSEDP investments are expected to be considered at SAEFP oblast level due to their insignificant volume and minimal environmental impact. In order to settle potential environmental impact there is a need in application of the best practices, preventative actions and mitigation measures identified within this paper regarding location, design, construction and project management.

Field supervision & monitoring.

The PIU technical staff will conduct monitoring of all **TSEDP** investments to ensure introduction of all environmental provisions, i.e. application of the best practices, preventative & mitigation measures. Upon investments completion the PIU technical staff is to verify that adequate practices, actions or measures were applied or all mitigations measures required were implemented. The PIU will conduct monitoring for compliance with environmental standards and include monitoring outputs in regular project reports.

MONITORING PROGRAMME

In the part of overall responsibility for the PIU of TSEDP to ensure implementation of regular environmental monitoring & assessment of the project activities. They will include control of the adequacy and effectiveness of preventive actions, mitigation measures and regular monitoring of environmental indicators. Monitoring outputs will be recorded, analyzed and reported throughout project lifetime. The PIU will account for results of its monitoring program in current project progress reports to be submitted to WB. WB supervision missions will review the monitoring program and its results on regular basis. Principally, the monitoring program is aimed to confirm overall success of project activities and will be directly focused on the areas and locations of the project activities. The content of monitoring will be defined by characteristics of the subject of monitoring. Monitoring will be included in project management system as feedback element with the view of adjustment of activity and identification of its success with regards to the project objectives.

Component A. *Strengthening of biodiversity preservation in specially protected natural areas and productive landscapes* will provide control of implementation of operations specified within the framework of each subcomponent as well as control of environmental effects caused by such operations.

Subcomponent A.1 Support of SPNA foresees the following:

- 1) control of implementation and allocation of relevant purchases of equipment etc.
- 2) monitoring of state of key SPNA ecosystems (conducting the assessment of the state at initial and final stages of the project)
- 3) IUCN methodology-based assessment of success of SPNA operations covered by the project to be implemented at initial and final stages of the project.

Subcomponent A.2 Conservation in the Broader Landscape through small grants. This subcomponent will finance small grants for local groups and organizations directly linked to either threats or opportunities for biodiversity protection around Protected Areas (SPNA).

- 1) Monitoring the implementation of small grants project in terms of spending
- 2) Monitoring the implementation of the small grants projects and apply tranche payments according to results of monitoring
- 3) Involve local administration, public and NGOs in the monitoring process

Subcomponent A.3 Sustainable tourism foresees the following:

- 1) monitoring of conformance to preventative measures of impact mitigation
- 2) monitoring of draft on funds generated from sustainable tourism and allocated to improve ecosystems protection within SPNA and surroundings.

The Component B. *Forestry and Carbon Trading in the KR* will provide control of implementation of operations specified within the framework of each subcomponent as well as control of social & environmental effects caused by such operations. Thus, the subcomponents foresee the following:

Subcomponent B.1. Reforestation and forest plantations:

- 1) Control of conformance to preventative measures of impact mitigation including environmental, social & economic ones
- 2) control of time & volume terms for restoration of natural forests
- 3) control of time & volume terms for creation of plantations of trees
- 4) record & polling-data-based assessment of successful use of plantations' products and successful press mitigation of natural forests to be implemented at final stage of the project

Subcomponent B.2 Monitoring and substantiation of carboxylic absorptions provides fulfillment of relevant standard-methodology-based assessments

Subcomponent B.3 Improvement of forest management:

- 1) control of completion of relevant legal documents
- 2) control of conducting training and other planned activities
- 3) monitoring of state of forests (plantations) to be implemented at initial stage and during the project.

Component C. *Project Management & Monitoring* will provide control of time & volume terms for planned activities, compliance of expected actions with the project objectives, conformance to preventative & mitigation measures specified within the framework of each component as well as control of social & environmental effects caused by such operations.

Control of conformance to preventative & mitigation measures. Also PIU (Project Implementation Unit) will be responsible for control of due implementation of various preventative & mitigation measures required in compliance with foregoing feasibility study in the framework of identified EMP ([Annex O](#)). It will entail organization of regular working missions with the view of verifying application of adequate preventative measures and/or mitigation measures. Annual social & economic reviews should be performed in order to control social outcomes and project progress.

Monitoring of environmental indicators.

During the whole period of TSED Project the PIU conjointly with SAEFP will perform regular monitoring and analysis of soil & water, vegetative resources of pasture lands in locations where project investment took place as well as in locations where herbicides were applied. Pursuant to the monitoring plan presented in [Annex O](#) this monitoring will include regular analysis of:

- quality of water resources such as streams and rivers, surface runoff, ponds or wells in project locations where herbicides are applied;
- quality of soils especially with regard to concentration of herbicides in project areas where herbicides are applied,
- baseline and comparative measurements in areas near project locations to measure existing background concentrations in environmentally relevant substances.

The PIU environmentalists conjointly with SAEFP and Kyrgyzprozem will deal with water/soil/vegetation sample intake in project's target areas through exploiting field equipment provided by this project, they will keep records of the results and regularly report on the results achieved. The samples taken for chemical analysis will be sent to national laboratory. The PIU will analyze all data sets and issue an annual summary report on results achieved within water & soil quality monitoring program through providing recommendations on adequate preventative measures or mitigation measures in those cases when implementation of such actions is required.

Monitoring of forest plantations

Effective monitoring implemented by SAEFP and other agencies carrying out supervisory functions of different aspects of environmental safety (i.e. Ministry of Health, Ministry of Agriculture, Water Industry & Processing Industry and Kyrgyzprozem), may be a guarantee of minimization and liquidation of prospective negative impact caused by afforestation. These agencies have a limited capacity in the monitoring sphere, particularly in rural area where the

most part of Project activity will be implemented. In this connection, monitoring of Forestry and Aiyl Okmotu lands allotted for plantations, that is aimed at erosion prevention is to be included into the monitoring of project investments providing for more productive and sustainable methods of plantation management. High-quality monitoring may show to what extent the management applied was appropriate, successful or unsuccessful.

The goal of monitoring of forest plantations and fast-growing wood species is to document changes in soil, water and other environmental aspects.

This methodology is applicable at community level. Leased forest plantations and monitoring of leased land plots may help to improve communities' attitude to forest and forest plantations and to increase their responsibility for rational use and improvement of forest plantations. Communities' inclusion into the process of reforestation and increase of forest plantations contributes to prevention of further deforestation and improvement of forest management in the Kyrgyz Republic.

This Project is aimed at monitoring of plantations and proposes introduction of the checklist (list of check issues) with a view to simplify monitoring procedures. Additional items may be included into this checklist at communities' discretion.

Table 7: Checklist on monitoring of plantations of fast-growing wood species

Name of Aiyl Okmotu: _____ Land plot owner _____

№ п/п	Indicators	Year of Project implementation TSED			
		2009	2010	2011	2012
1	area				
2	state of plantation area (stoniness, salinity, water logging)				
3	state of plantations				
	establishment				
	damage				
	indicators for pests				
	indicators for disease				
4	state of irrigation network				
5	soil condition (density, consolidation, erosion, etc.)				
6	assessment of infrastructure state				

Table 8: Checklist on monitoring of forest plantations

Name of Forestry _____ plot _____

№ п/п	Indicators	Year of Project implementation TSED			
		2009	2010	2011	2012
1	area				
2	state of plantation area (stoniness, state of slope)				
3	state of plantations				
	establishment				
	damage				

	indicators for pest				
	indicators for disease				
4	soil condition (density, consolidation, erosion, etc.)				

This Project will be directed at stimulation of potentiality of local self-government development in the sphere of environmental monitoring and total environmental management. In this connection, the Project is to ensure introduction of efficient monitoring programs in project investments that are financed by the Project, as well as to reimburse expenses caused by implementation of such monitoring. Project investments that have a capacity for significant environmental impact are to develop monitoring plan, as it is a constituent element of set of documents required for getting approval to project investments implementation. Monitoring results will be taken into account at considering applications for financing. Moreover, the WB is to conduct monitoring of project investments selection within the framework of regulating supervisory missions in order to identify conformity of the project investments with mitigation plans.

6. TASK

Support in coordinating the environmental assessment within and between all relevant Government agencies, and in obtaining and incorporating the views of affected/beneficiary groups and non-governmental organizations (NGOs) through public consultations. Preparation of reports (EMP and ARPF) in compliance with WB standards as well as Kyrgyz & Kazakh ESA procedures.

INSTITUTIONAL STRENGTHENING PROGRAMME

In order to ensure proper implementation of different environmental activities (preventive measures, monitoring) recommended in this EMP, TSEDP will assure necessary institutional strengthening of the PIU under SAEFP, as well as support of social coverage for environmental management provided to community-based institutions dealing with tree-planting and to their members. This institutional strengthening will include rendering technical assistance and training, and support to social coverage/activities on public awareness as well. Description of every kind of activity is provided below.

Technical assistance and training. In order to ensure proper implementation of environmental activities identified by EMP, TSEDP will employ national environmentalist/ expert on environmental monitoring for work with EMP during the whole period of Project implementation. The Expert will provide technical assistance in the whole of environmental supervision and monitoring activities identified by feasibility study and EMP. Particularly, the Expert will be engaged in organization of appropriate training sessions on environmental issues for PIU experts of the Project working with the Project communities both in the sphere of increase of environmental awareness and in the sphere of strengthening environmental management capacity of Project staff in general. These training sessions will be directed at development of special technical skills necessary for implementation of environmental supervision and required monitoring functions. Moreover, Environmental Expert will render assistance in conducting activities on environmental coverage to community-based institutions established within framework of the Project through increase of awareness on sustainable plantation management practices and environmental requirements applicable to investments.

SAEFP capacity building. TSEDP will render technical assistance in order to strengthen institutional capacity of Forestry Department on environmental control and activities on monitoring of plantation management. In this regard environmental expert will provide on-the-spot training for technical staff of Forestry Department’s central & regional divisions in order to enable them to perform such supervision and monitoring responsibilities. If it is needed the supplementary technical training on implementation of monitoring and analysis will be provided for relevant staff.

Public outreach and awareness. Also TSEDP will contribute to coverage and public awareness actions within target communities and will assist their institutions dealing with afforestation management. This support will cover performance of information campaigns: workshops with community-based organizations involved at the level of AO, dissemination of publications on afforestation management & monitoring or another social coverage and similar information actions. Campaign will involve all community members and include information relating to forest plantation activities, possible benefits and privileges for community, procedures of compensation in the case of their infringed interests.

Work Schedule

Implementation of the activities described in the EMP will begin simultaneously with project implementation, with an immediate review and refinement of the details of the mitigation plan, monitoring plan and institutional strengthening program proposed above. The PIU, with the support of the environmental specialist, will then ensure implementation of the mitigation and monitoring plans and institutional strengthening program, as appropriate given the schedule of forest management-related and other infrastructure investments under the project.

The institutional strengthening activities, for example, will take place over the life of the project, on the basis of identified needs, with scheduled training for PIU environmental management specialists occurring early in project implementation, followed by the outreach and public awareness activities. The environmental specialist will be hired by the PIU on an on-demand, part-time basis for the lifetime of the project.

The monitoring plan will be implemented throughout the lifetime of the project based on the schedule of project interventions with community-based forest management organizations and with the small-scale infrastructure investments. Periodic monitoring will be used to evaluate the impacts of mitigation measures and track baseline environmental conditions in the areas of project intervention.

The proposed schedule for implementing EMP activities is shown in Table 9.

Table 9

EMP Implementation Schedule

EMP Activities	2009	2010	2011	2012
Mitigation Plan (Annex N):				
Component A.	+	+	+	+
Component B.	+	+	+	+
Monitoring Plan (Annex O):				

Component <i>A</i> .	+	+	+	+
Component <i>B</i> .	+	+	+	+
Institutional Strengthening:				
Technical assistance (env. consultant)	3 months	3 months	3 months	3 months
Training	+	+	+	+
Public outreach and awareness	+	+	+	+

Institutional framework

Responsibility for EMP implementation will be shared by the PIU and the SAEFP. The SAEFP, working conjointly with the PIU, will have overall responsibility for implementation of **TSEDP** and will ensure that the EMP is fully integrated into implementation of the project, including the monitoring and reporting. More specifically:

- The PIU will assume responsibility for (a) the design and assessment of the physical works in accordance with Kyrgyz environmental norms, regulations and requirements and (b) the physical implementation of the activities under the project. Contractors will be responsible for implementation of the construction works in accordance with environmental requirements specified in the site-specific EMPs and bidding documents.
- The PIU’s environmental specialist will work to ensure that all preventive actions and mitigation measures identified by the site-specific EMPs are undertaken in a proper and timely manner and will take the necessary actions to monitor their effectiveness. To the extent feasible, the local SAEFP staff in the project oblasts will assist the environmental specialist in monitoring implementation of the mitigation plan. Where it becomes apparent that different or additional measures are required to minimize potential negative impacts, the environmental specialist, with the advice of the SAEFP staff, will recommend such measures to the PIU.
- The environmental specialist will supervise all construction activities in the field for planned civil works and infrastructure, explain environmental management plans to contractors and other relevant stakeholders (e.g. local residents), illustrate environmental protection and mitigation measures and report cases of non-compliance to the PIU. The environmental specialist will also work and liaise with the responsible authorities for environment and construction and coordinate joint supervision efforts.
- The environmental specialist will also oversee implementation of the environmental monitoring plan specified in the EMP, ensuring that monitoring is performed effectively and that information is shared promptly with appropriate project and SAEFP officials. The specialist will package the results of the ecological and social monitoring in annual reports to the PIU Project Coordinator, national and local GOKR officials.
- The environmental specialist will directly manage the institutional strengthening activities recommended by the EMP, including scheduling training, overseeing the purchase of equipment and managing efforts to raise public awareness.

SAEFP will work closely with the PIU in implementing the EMP. SAEFP, through its state ecological expertise functions, will be the primary monitoring agencies for TSEDP activities and will support the environmental specialist in the assessing the environmental impacts of project activities, evaluating the effectiveness of the preventive actions and mitigation measures taken and performing the ecological monitoring assigned. Committees will collaborate with the environmental specialist to ensure that environmental considerations are incorporated into their activities, not only in the construction/rehabilitation, operation and maintenance of forest infrastructure but in improved practices for forest, pasture, water and soil resources management among their members.

Institutional Strengthening

1. Purchase of equipment

Table 10

Purchase of equipment

Type of equipment, title	Local or international purchase	Number	Price \$	Total \$
Field Monitoring equipment: microprocessor hardware (turbidity)		1	960	960
Total				960

2. Information campaigns on public awareness, training

Table 11

Information campaigns on public awareness, training

Kind of training, title	Venue, executor	Number of training	Duration, days	Number of	Costs \$	Total \$
Training on soil/water quality protection, adequate waste management techniques	Bishkek, oblast centres	2	1	25	1,500	3,000
Training on methodology system of forest-protection actions and herbicides/ pesticides/ insecticides application techniques	Bishkek, oblast centres	2	1	25	1,500	3,000
Training on management techniques	Bishkek	3	1	20	1,500	4,500
Campaigns on public awareness	oblast centres	7	1	50	1,000	7,000
Total						17,500

3. Consultant's services / Special surveys

Table 12

Consultant's services

Kind of services	Executive summary of ToR	Local or international	Validation	Costs \$	Duration, months	Total \$
Supervision for implementation of construction works in compliance with environmental standards	ToR	local	EMMP	700	3	2,100
Control of implementation of environmental monitoring plan identified within EMP	ToR	local	EMMP	700	3	2,100
Scheduling training sessions	ToR	local	MP	700	3	2,100
Public Awareness-Raising Guidelines	ToR	local	MP	700	3	2,100
Total					12	8,400

CONSULTATIONS WITH BENEFICIARIES

In October-November 2008 a team of Consultants initiated consultation meetings with relevant stakeholders and project beneficiaries under implementation of environmental & social assessment: there were meetings with PIU staff, SAEFP officials and scientific associates held in Bishkek. During working missions within rayons of the project's target area the project team had meetings with local authorities, village councils, "aksakals" councils (councils of the elders), staff of specially protected natural areas, reservations, national parks, local forestry agencies as well as with a big number of farmers and other beneficiaries. Public consultation meetings pursuant to EIA of the KR, EIA of the RK and WB were held in February in Bishkek and in Almaty.

The outcome of the consultations did not indicate any resistance, negative attitude, dissatisfaction or other issues warranting a change in project design or implementation planning from the affected stakeholders and population.

PROPOSED BUDGET

The estimated costs of implementing the various activities specified in the EMP are displayed in Table 13. The costs are broken down in terms of personnel expenses (i.e. the part-time environmental specialist), institutional strengthening expenses (i.e. training, public awareness), monitoring program expenses (laboratory analyses) and equipment costs.

The project should make every effort, however, to ensure that the GOKR shares some of the costs that support government functions (e.g. monitoring by the SAEFP). The costs of the EMP will be included in the total costs. No additional costs are envisaged in implementation of the EMP.

Table 13

Proposed EMP Budget

EMP Category	Quantity	Unit Rate (US\$)	Cost (US\$)
Personnel:			
PIU environmental specialist (part-time over 4 years)	12 m*	700/m	8,400
Institutional Strengthening:			
- training, workshops, etc.	7	1,500	10,500
- public outreach/awareness campaigns	7	1,000	7,000
Monitoring Program Expenses:			
Laboratory costs (estimated based on other projects)	4 yrs.	2,000	8,000
Travel costs	4 yrs.	1,000	4,000
Field Monitoring Equipment:			
- microprocessor device (turbidity)	1	960	960
TOTAL			38,860

* person months of labour

7. TASK

Draft report for above tasks is prepared. The final reports will incorporate the changes resulting from the comments received from the public consultations and comments made by the two Governments and the World Bank. All reports are available in Russian and English language with executive summaries in Kyrgyz & Kazakh.

Annex A Environmental Policies, Plans and Programs of the Kyrgyz Republic

Environmental Policies, Plans and Programs	Goals & objectives
	Kyrgyz Republic
Country Development Strategy 2006–2010 (CDS)	Provision for environmental safety, increase of the level and quality of life of the country's citizens through sustainable economic growth, creation of conditions for full employment, receipt of a high and stable income, accessibility to a wide range of social services and observance of high living standards favorable to a healthy environment
National Environmental Action Plan (NEAP), 1995-1997	To ensure sustainable economic growth and reduce poverty, to improve management of renewable and non-renewable natural resources and public health protection.
National Strategy and Action Plan on Sustainable Development of Mountainous Territories of the KR	To ensure optimal benefits from mountain resources for the rural population of Kyrgyzstan. A main focus of this document was on managing agricultural resources, including pastures and meadows.
Millennium Development Goals (MDGs) 2000	Support of sustainable development principles
	The RK
Strategic Development Plan of the RK till 2010	Control of environmental safety that identifies the key areas for environmental conservation and efficient nature management
Environmental Conservation Programme for 2008 – 2010	Optimization of system for environmental quality management, conservation and restoration of natural environment, reduction of adverse environmental effect on population health
Environmental Safety Concept of the RK for 2004-2015	To ensure protectability of natural systems, essential public concerns and individual rights against the threats causing by anthropogenic and natural environmental impacts

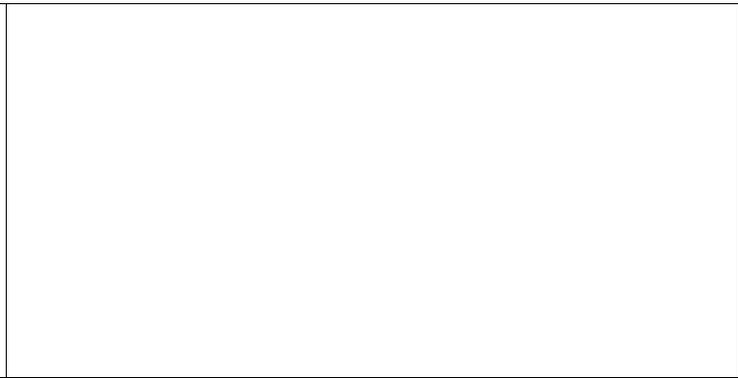
<p>«<i>Jasyl Programme</i> EI»</p>	<p>Increase of treeplanting, settlement gardening and increase of percentage of forest land through young people involved in these activities</p>
<p><i>Programme for conservation and efficient management of water resources, fauna and development of network of specially protected territories till 2010</i></p>	<p><i>Conservation and efficient management of water resources, fauna and</i> promotion of the network of specially protected territories</p>
<p>Programme for desertification control in the RK for 2005-2015</p>	<p>To suspend and prevent the desertification processes within the territory of the Republic of Kazakhstan</p>

Annex B Principal KR & RK Laws, Regulations and Resolutions that are relevant to TSED Project

Principal Laws, Regulations and Resolutions of the KR that are relevant to TSED Project

Legal Authority	Legal Mandate
Constitution (1993)	Addresses environmental protection and management of the country's natural resources, rights and duties of citizens
Law on Environmental Protection (1999)	Defines national environmental policy and establishes the legal and institutional framework for environmental protection and use and management of natural resources
Law on Specially Protected Natural Areas	Defines national policy on conservation of natural bodies and complexes in natural state
Law on Ecological Expertise (1999)	Requires environmental review (ecological expertise) and the prevention of negative environmental and human health impacts from economic and other activities
Land Code (1999)	Regulates the use and management of lands (agricultural, pasture, etc.)
Law on Mountainous Territories (2002)	Regulates management of natural, historical and cultural resources, including pastures, in mountainous areas
Law on Administration of Lands for Agricultural Purposes (2001)	Regulates the use of lands for agricultural purposes
Regulation on Allocation of Pastures for Rent and Use (2002)	Establishes current allocation system governing use and rent of pasture lands
Regulation on Procedures to Transfer (Transformation) lands from one category to another one or from one type to another one (2008)	Identifies the procedures to transfer (transformation) lands from one category to another one including transformation of types of lands.
Law on Pastures (was adopted by the Parliament and is under consideration of the KR President)	Would promote sustainable management of pastures, employing community-based approach and transferring responsibility to the <i>aiyl okmotu</i>
Law on Chemicalization and Protection of Plants of the KR as of December 28, 1998.	Regulates relationship in the field of application of herbicides

Regulations of State Department for Chemicalization, Protection & Quarantine of Plants under the Ministry of Agriculture, Water Industry & Processing Industry of the KR as of 2005 implements public management (control and supervision) in the field of chemicalization & protection of plants.



**Principal Laws, Regulations and Resolutions of the RK
that are relevant to TSED Project**

Legal Authority	Legal Mandate
Law about Environmental Protection (1999)	Identifies national environmental policy, legislative and institutional frameworks for environmental protection and nature management
Environmental Code of the RK	Regulates relations in environmental protection, restoration and conservation, management and reproduction of natural resources while implementation of economic and other activity
RK Water Code was adopted on July 9, 2003 (with amendments and additions as of 27.07.2007).	Identifies the priority water supply to satisfy population's needs for drinking water use and residential use and envisages a number of standards for efficient management, protection and improvement of water resources
RK Land Code (2003)	Regulates land use and land management. Land protection, state control, land management, monitoring and land cadastre
RK Forest Code (2003)	Regulation of forest legal relationship for ensuring conservation, protection, restoration of forests and forestation, efficient and balanced use of environmental and resource capacities of forests; conservation of biological diversity, facilities of natural reservation inventory
«About specially protected natural areas» RK Law (2006)	Regulates public relations in creation, extension, conservation, restoration, sustainable use and management of specially protected natural areas and facilities of state natural reservation inventory
«About conservation, reproduction and use of fauna» RK Law (2004)	Identifies the key standards for conservation of fauna and its environment, use of fauna bodies, regulates the issues of hunting and fishing management
RK Environmental Safety Concept for 2004-2015	Stipulates strategic environmental objectives
Law about Environmental Expertise (1999)	Requires overview (environmental expertise) and prevention of negative environmental impacts and negative impacts on public health as a result of economic and other activity

International biodiversity conservation agreements

№№	Title	Year of accession / signing	
		Kazakhstan	Kyrgyzstan
1	Convention on Biological Diversity	1994	1996
2	Convention Concerning the Protection of the World Cultural and Natural Heritage	1994	1995

3	Convention to Combat Desertification	1997	1999
4	Vienna Convention for the Protection of the Ozone Layer	1997	2000
5	Framework Convention on Climate Change	1995	2000
6	Convention on International Trade in Endangered Species of Wild Fauna and Flora	2001	2007
7	Convention on Environmental Impact Assessment in a Transboundary	-	2001
8	Ramsar Convention on Wetlands of International Importance	-	2001
10	Agreement between the Government of Kazakhstan, Government of Kyrgyzstan and Government of Uzbekistan on Cooperation in the Field of Environmental Protection and Rational Use of the Nature (Bishkek)	1998	1998
11	Agreement between the Government of Kazakhstan, Government of Kyrgyzstan, Government of Tajikistan and Government of Uzbekistan on Cooperation in the Field of Quarantining of Plants (Astana)	2000	2000

Annex C. Primary State Environmental Institutions that are relevant to the TSED Project

Institution	Relevant Responsibilities
Kyrgyz Republic	
State Agency for Environment Protection and Forestry (SAEPF) - Department of National Ecological Expertise	Management of environmental protection activities, Monitoring of the state of the environment in general and the water bodies in particular, Reviewing Ecological Expertise of diverse projects, Monitoring wastes from economic activities
Ministry of Agriculture, Water Resources, and Processing Industry (MAWRPI): - Pasture Department (PD) - State Department for Chemicalization, Protection & Quarantine of Plants under the (MAWRPI) - State Veterinary Department (SVD)	Development of state policy on agricultural issues, including land and agrarian reform, pasture management, livestock, veterinary services, crop production, plant quarantine, plant protection, land-reclamation, etc.
State Agency for Registration of Rights to Immovable Property (SARRIP) - - Kyrgyzgiprozem	Coordination and operation of State registration system for immovable property, land surveying and cadastre, development of a land market system, etc.
National Statistical Committee (NSC)	Organization and management of state accounting, collection, processing, analyzing and summarizing statistical information.
Republic of Kazakhstan	
Ministry for Environmental Protection of the RK (PK MEP) Committee for Environmental Regulation & Control	Administration and intersectoral coordination of issues pertaining to development and implementation of national policy in the field of environmental protection and nature management. Regulates and implements state environmental control in the field of environmental protection and conservation of natural resources.
Ministry of Agriculture of the RK (RK MA) Committee for Forest & Hunting Management Water Committee	Intersectoral coordination of issues of its competence and implementing the functions assigned by the Constitution, laws and other regulatory legal acts of the Republic of Kazakhstan. Implements special executive and control & supervision functions in the field of forestry, protection of reproduction & use of fauna (except fish and other hydro-fauna species), specially protected natural areas. Ensures implementation of national policy in the field of use & conservation of inventory of water resources
Land Management Agency of the Republic of Kazakhstan	Administration in the field of management of land resources, geodesic and mapping activities in the framework envisaged by legislation, intersectoral coordination and other special executive and licensing functions.
Statistics Agency of the Republic of Kazakhstan	Formulates and implements national statistic policy, developing and performing programmes for statistics improvement in the Republic of Kazakhstan.

Annex D Tien Shan Access Restriction Process Framework

The project component which is the subject of this framework is primarily the reforestation and carbon trading component. The reforestation and carbon trading component will afforest and reforest 13,950 ha of marginal land

- 55% by communities and private investors in Aiyl Okmotus (AO) land. Reforestation and afforestation activities on this land will be conducted according to the principles of Social Mobilization which have been developed by ARIS (the Community Development Agency responsible for implementing this component on AO land)
- 8% by private investors in State Forest Fund (SFF) land
- 37% by State Owned Forest Enterprises or Lezkhozes in State Forest Fund land

This framework describes how the World Bank's resettlement policy is triggered by this activity, the overall objective of the framework, the justification for the framework, the process pursued during preparation, the process to be pursued during implementation, grievance and conflict resolution mechanisms, and monitoring and evaluation. The access restriction implications of the biodiversity component will be minimal but should a case arise where access is restricted as a result of these components, then the same procedures described in this framework would apply.

Policy Trigger

During the preparation phase of the project it was decided that no land currently classified as pasture or as arable land would qualify for afforestation or reforestation. Instead the focus is exclusively on marginal Lezkhoz or Aiyl Okmotus land which is neither forested, designated for pasture, considered arable, or under a leasing arrangement.

However, it is possible that on both types of land there is informal seasonal (mostly during winter) grazing of livestock. As such, the reforestation and afforestation of this land may restrict access to pasture resources which may form a component of the livelihoods of livestock producers. Thus, even though there is no land acquisition, or displacement of households, because informal access to a natural resource (pasture) may be restricted the World Bank's Involuntary Resettlement Policy (OP 4.12) is triggered.

Framework Objective

The objective of this framework is to minimize the risk of conflict between pasture use and forestry and to ensure that no individual or collective livelihood is negatively affected by the project. *As such, the primary purpose of this framework will be to describe a participatory process for validating and identifying sites for forestation where there is no possibility of conflict between pasture use and forestry use.*

The Justification for a Process Framework

The Involuntary Resettlement Policy (OP 4.12) is triggered because forestation activities may restrict access to resources such as pasture resources for livestock producers. Project activities will not require or entail any land acquisition and/or physical relocation of people. In addition, the Strengthening Biodiversity Conservation Component does not have the objective of enlarging protected areas, but only to improve the management of existing ones. To address the risk that access to pasture resources will be curtailed, an Access Restriction Process Framework has been prepared.

Good practice has demonstrated that in the case of natural resource access restriction, the objectives of the policy can be better achieved through a participatory process such as the one outlined in this framework. This participatory process is primarily focused on the identification of afforestation and reforestation sites that do not conflict with either formal or informal pasture use. Assistance measures will only apply in exceptional circumstances where no alternative sites can be identified.

Process during preparation

During preparation a social assessment was carried in order to

- Identify the main social, environmental and economic benefits of the project identify possible social and environmental risks for the project
- Recommend measures to mitigate such risks.

The social assessment was based on a desk study of existing documents and statistics, focus groups and in-depth interviews in nine villages selected for their differing social, ecological, and economic conditions. Among these villages a survey of 275 residents was carried out. This assessment demonstrates that on the whole the project's impact will be positive, contributing to employment, poverty alleviation, environmental improvement, and improved access to fuel sources.

Nevertheless, some afforestation and reforestation activities on marginal land may have a negative impact on livestock users through restricting their access to seasonal pastures. This was seen as justification for the preparation of a resource access restriction process framework. Another activity to be conducted during preparation is a field study exercise. This exercise will investigate the technical feasibility of the planting on the sites proposed. Part of the exercise was to determine whether or not the land is currently used for pasture.

Process to be followed during Implementation

This process framework describes the criteria and procedures to be followed under the project in order to minimize the risk of project induced restriction of access to seasonal pasture on marginal AO and SFF land. It describes a step-by-step process starting with an information campaign, followed the establishment of Access-Restriction Management Groups, then the participatory validation of sites, followed by the participatory identification of alternative sites and in exceptional circumstances the creation and implementation of measures to assist **in improvement or restoration of livelihoods** assistance mechanisms. The Project will explore the application of the ARP Framework provisionally with two pilot AOs, which have been selected by ARIS.

Information Campaign on the likely impact of the Project

This is a comprehensive campaign for all community members describing the main components of the project, the land it is likely to affect, and the potential positive and negative impacts. On AO land, village level information campaigns are already part of the Social Mobilization approach used by ARIS, the agency responsible for implementing this component. On SFF land, a special information campaign will need to be organized either by the State-Owned Enterprise or Lezkhoz responsible for that land throughout the Rayon (using mass media) and in adjoining communities (through consultation meetings).

Establish Access-Restriction Management Groups (ARMGs)

For AO land, the Local Investment Union Executive Committee (LIC) responsible for reviewing and processing project investments should also take responsibility for establishing these groups. Such groups should ideally include AO Officials, LIC Officials, Ayil Kinesh Representatives, pasture management committee representatives (when established), Lezkhoz representatives, pasture user union representatives, NGO's and other civic organizations and vulnerable groups (women / young people). Similar structures should also be established for SFF land. The Leskhoz or State Owned Enterprise should convene these groups jointly with the AO.

Participatory Validation of Sites Selected

For both AO and SFF land, techniques such as participatory resource mapping should be used to validate that the sites selected do not conflict with formal or informal grazing. The outputs of this process needs to be formally documented in a written report (which would include visual aids such as maps) which would be transmitted to the relevant PCU and PIUs. On AO land such techniques will be applied in the early stages of a specially tailored Social Mobilization Process. However, Lezkhoz staff will also benefit from training in these techniques so they can conduct similar exercises on SFF land.

Participatory Identification of alternative sites

If it transpires that there is a conflict between pasture use and plans for afforestation and reforestation the ARMGs for both AO and SFF land should determine whether or not this use occurred before or after the field study exercise conducted during the preparation phase. The field study exercise will represent the cut-off date for identifying project affected persons (PAPs).

If pasture use pre-dates the field study exercise, then every effort should be made to identify alternative plots for afforestation and reforestation where there is no conflict between pasture and forest use. This needs to be a joint exercise between the ARMGs (responsible for participatory resource mapping) and a field study team (to determine the technical feasibility of planting in these new sites). Again, this process needs to be documented in a report format that can be transmitted to the relevant PCU and PIU.

Agree and Implement Measures to assist in improvement or restoration of livelihoods

As a last resort, if there is no alternative sites that can be identified, the ARMGs will have to determine whether or not **measures to assist in improvement or restoration of livelihoods** will be provided to informal users affected, and what form this assistance should take. This determination of whether or not assistance should be provided and the form it should take should be done in consultation with the relevant Project Coordination Unit and Project Implementation Unit. **Measures to assist in improvement or restoration of livelihoods** that might be considered as a last resort include the following:

- (a) the provision of livestock forage for the duration of the project,
- (b) priority status for receiving benefits from the forest e.g. temporary employment, fuelwood, grazing, non-timber forest products.
- (c) the provision of forage seeds and fertilizer to improve communal pasture land in proximity to settlements.
- (d) the option of leasing alternative pasture sites along in combination with other forms of assistance e.g. the provision of livestock forage, provision of seeds and fertilizer to improve the pasture, as well as priority status in receiving benefits from the newly forested land.

Grievance and Conflict Resolution Mechanism

A pro-active approach should be taken to avoid conflicts before they begin. This might involve (a) widespread disclosure of project information and on the role and responsibilities of the ARMGs (b) clear eligibility criteria for **measures to assist in improvement or restoration of livelihoods** under the process framework (c) clear terms of reference for the stakeholders involved in the ARMG (d) continued information campaigns on the benefit of the project and the importance of afforestation and reforestation efforts.

If conflicts do arise, the ARMG needs to organize a meeting with the affected party to try and work out a satisfactory solution. If the solution is not satisfactory to the party involved, then the relevant PIU will be responsible for convening and moderating a meeting between the affected party and the members of the ARMG. Both the ARMG and the PIU are obliged to keep records of all decisions made regarding compensation claims and complaints relating to compensation procedures.

Monitoring and Evaluation

Monitoring and evaluation of the implementation of this process framework will be the responsibility of the relevant regional project coordination unit. If necessary, some monitoring and evaluation functions could be contracted out to a third party such as a specialized private firm or non-governmental organization with expertise in this topic (land use, pasture management, sustainable livelihoods).

PIU representatives should conduct visits to a sample of sites selected for afforestation and reforestation in order to determine the level and nature of informal grazing that is taking place prior to project implementation. PIU representatives should also conduct annual consultation meetings in a sample of communities to determine the level of satisfaction at the village level with the implementation of the process framework.

Relevant quantitative data on the process framework (number of persons affected, level of impact, type and amount of compensation provided, duration of compensation) should be communicated to the PIU on a biannual basis. As part of the social mobilization process, village-based participatory monitoring and evaluation is also envisaged, and will play a role in monitoring the implementation of the process framework.

Annex E Species of Red Book IUCN at the Territory of Tien Shan

	BIRDS	
1	<u>Ciconia nigra</u>	BLACK STORK (Eng)
2	<u>Anser erythropus</u>	LESSER WHITE-FRONTED GOOSE (Eng)
3	<u>Aythya nyroca</u>	FERRUGINOUS DUCK (Eng)
4	<u>Oxyura leucocephala</u>	WHITE-HEADED DUCK (Eng)
5	<u>Pandion haliaetus</u>	OSPREY (Eng)
6	<u>Circaetus gallicus</u>	SHORT-TOED SNAKE-EAGLE (Eng)
7	<u>Aquila heliaca</u>	EASTERN IMPERIAL EAGLE (Eng)
8	<u>Aquila chrysaetos</u>	GOLDEN EAGLE (Eng)
9	<u>Aquila rapax</u>	TAWNY EAGLE (Eng)
10	<u>Aquila clanga</u>	GREATER SPOTTED EAGLE (Eng)

1 1	<u>Hieraaetus fasciatus</u>	BONELLI'S EAGLE (Eng)
1 2	<u>Hieraaetus pennatus</u>	BOOTED EAGLE (Eng)
1 3	<u>Haliaeetus albicilla</u>	WHITE-TAILED EAGLE (Eng)
1 4	<u>Gyps fulvus</u>	EURASIAN GRIFFON (Eng)
1 5	<u>Gyps himalayensis</u>	HIMALAYAN GRIFFON (Eng)
1 6	<u>Aegypius monachus</u>	CINEREOUS VULTURE (Eng)
1 7	<u>Gypaetus barbatus</u>	LAMMERGEIER (Eng)
1 8	<u>Neophron percnopterus</u>	EGYPTIAN VULTURE (Eng)
1 9	<u>Circus macrourus</u>	PALLID HARRIER (Eng)
2 0	<u>Falco cherrug</u>	SAKER FALCON (Eng)
2 1	<u>Falco peregrinus</u>	PEREGRINE FALCON (Eng)
2 2	<u>Falco pelegrinoides</u>	BARBARY FALCON (Eng)
2 3	<u>Falco naumanni</u>	LESSER KESTREL (Eng)
2 4	<u>Bubo bubo</u>	EURASIAN EAGLE-OWL (Eng)
2 5	<u>Athene noctua</u>	LITTLE OWL (Eng)
2 6	<u>Columba eversmanni</u>	PALE-BACKED PIGEON (Eng)
2 7	<u>Carpodacus rubicilla</u>	GREAT ROSEFINCH (Eng)
	MAMMALS	
2 8	<u>Otonycteris hemprichii</u>	DESERT LONG-EARED BAT (Eng)
2 9	<u>Tadarida teniotis</u>	EUROPEAN FREE-TAILED BAT (Eng)
3 0	<u>Cuon alpinus</u>	RED DOG (Eng)
3 1	<u>Ursus arctos</u>	BROWN BEAR (Eng)
3 2	<u>Vormela peregusna</u>	MARbled POLECAT (Eng)
3 3	<u>Uncia uncia</u>	SNOW LEOPARD (Eng)
3 4	<u>Martes foina</u>	BEECH MARTEN (Eng)
3 5	<u>Ovis ammon</u>	ARGALI (Eng, Fre)

3 6	<u>Marmota menzbieri</u>	MENZBIER'S MARMOT (Eng)
	REPTILES	
3 7	<u>Vipera ursinii</u>	MEADOW VIPER (Eng)
	FISH	
3 8	<u>Aspiolucius esocinus</u>	PIKE ASP (Eng)

Annex F. Dynamics of composition of the main forest-generating species within the forests under the authority of SAEFP

№	Land category	Year of registration		Difference	
		1998 г. тыс.га	2003 г. тыс.га	тыс.га	%
Main forest-generating species		789,7	834,7	+45,0	5,7
1	Conifers – total	286,8	296,5	+9,7	3,4
	Including: pine	2,3	2,4	+0,1	4,3
	fir	111,2	116,5	+5,3	4,8
	silver fir	3,6	3,7	+0,1	2,8
	larch	1,5	1,6	+0,1	6,6
	tree-type archa	168,2	172,3	+4,1	2,4
2	Hard-leaved – total	34,9	35,9	+1,0	2,9
	Including: oak	-	-	-	-
	ash	0,5	0,6	+0,1	20,0
	maple	28,4	29,2	+0,8	2,8
	elm and others from the elm family	5,8	6,0	+0,2	3,4
	bastard acacia	0,2	0,1	-0,1	50,0
3	Soft-leaved – total	15,0	20,2	+5,2	34,6
	Including: birch	5,4	7,3	+1,9	35,2
	aspen	0,9	2,9	+2,0	2,2 times
	poplar	7,3	7,9	+0,6	8,2
	littletree willow	1,4	2,1	+0,7	50,0
4	Other wood species – total	102,0	116,2	+14,2	13,4
	Including: apricot	1,0	1,5	+0,5	50,0
	pear	-	0,1	+0,1	-
	hackberry	1,7	1,6	-0,1	5,9
	mountain ash	0,8	1,7	+0,9	1,1 times
	almond tree	1,6	2,2	+0,6	37,5
	European walnut	35,2	40,5	+5,3	15,0
	pistachio tree	33,1	36,6	+3,5	10,5
	apple tree	17,3	18,0	+0,7	4,0
	tree-type hawthorn	-	1,9	+1,9	-
	other wood species	11,3	12,1	+0,8	7,1
5	Shrubs – total	351,0	365,9	+14,9	14,2
	Including: procumbent archa	100,7	104,7	+4,0	4,0
	hawthorn	3,0	7,0	+4,0	1,3
	tamarisk	0,4	0,4	-	-
	marsh elder	15,7	24,5	+8,8	56,0
	oleaster	0,6	0,6	-	-
	sea-buckthorn	4,0	6,1	+2,1	52,5
	brier	38,8	38,7	-0,1	-0,2
	pearlbush	2,1	3,6	+1,5	71,4

	афлатуния	0,9	2,3	+1,4	1,5 times
	other shrubs	184,8	178,0	-6,8	-3,7

Annex G Analysis of drawbacks when creating forest plantations

When planting on the lands of SFF monocultures are being created, while mixed cultures are created rarely. Consumption of planting stock depends on conditions of each region, and in average in plain zone makes up about 3 thousand pcs. per 1 ha and from 4 thousand pcs. to 6 thousand pcs. per 1 ha - 6 min psc. This amount is overestimated. Forestry specialists plant bigger amount of planting stock to enable high degree of plantation preservation. For example, in plain zone, according to current global practice, it is enough to plant 1000-15000 psc. per ha of poplar, while in mountain zone - about 1000-2000 of seedlings of, for instance, spruce, pine and other conifers.

Maintenance should be provided in created forest during 5 years, which includes manual and mechanized care as well as irrigations in plain zone. Often due to the lack of funds maintenance is not provided, which significantly impacts establishment of forest species. All costs related to the creation of forest specimen are not funded from the state budget at the moment, but rather are provided from the own funds of the LHs. Average cost of 1 ha of forest specimen makes up from 800 – to 2,500 soms depending on the region and method of creation. This amount includes preparation of the soil and seeding or planting of forest specimen, i.e. the cost of planting stock and seeds is not included. Due to financial constrains during recent years inadequate attention was paid to reforestation activity, including cultivation of standard planting stock in the LHs of the republic. After the disintegration of the USSR the LHs of the KR used fertilizers on a very limited basis, this are mainly organic fertilizers used in nursery forests. For quality creation of forest specimen and cultivation of standard planting stock the LHs of the republic should apply nitrogenous, potash and other fertilizers. Irrigation water is supplied on paid basis. Irrigation is made using small canals (aryk), the condition of the irrigation network is poor.

Coming from agro technical requirements for creating sylvula, the LHs of the KR annually need about 50 mln. soms. Forest resources are very important for Kyrgyz economy and for the sustainability of mountain ecosystems. So, reforestation and improvement of forest management are important economic and social tasks for the government of the Kyrgyz Republic. However, efforts of the government in terms of forest development are not sufficient.

Intensive use of forest resources of Kyrgyzstan caused acute misbalance of forest ecosystems, and as a consequence, loss of biological sustainability of plantations. This became the reason for wide spread pathological occurrence in the forest, including mass damage of plantations by insects and worsening of its sanitary condition. The same situation is observed in the south of the republic in walnut-fruit forests and in spruce and flood plain forests in the north.

Especially valuable species of walnut-fruit forests - walnut (*Juglans regia L.*) and pistachio (*Pistacia vera L.*) are considerably damaged by pest insects that reduce harvest of nuts up to 20-60%, while during low-yield years – up to 90%. In addition, there are moving centers of mass reproductions of gypsy moth (*Limantria dispar L.*) here that exist for more than 50 years already. Pistachio, wild apple (*Malus kirgisorum Al. et An Theob.*), species of Crataegus (hawthorn), Sogd plum – cherry-plum (*Prunus sogdiana Wass.*) suffer from this insect significantly. The latter in addition, has been considerably damaged by plum scale (*Sphaerolecanium prunastri Fonsc.*) for the last two decades, while plantations of hawthorn suffer from periodical outbreaks of mass reproductions of cherry saw-fly (*Caliroa cerasi L.*). Semenov's mapple (*Acer semenovii Rgl.*) and Turkestan mapple (*A.turkestanicum Pax.*) are significantly damaged by geometer (*Erannis defoliaria Ch.*). Periodically, during 3-4 years those completely shed leaves.

There is unfavorable situation in flood-plain forests, where various species of poplar and willow are mainly growing. During the last 10-15 years catastrophic drying of willow is observed in Kochkor and Rybachinsky LHs located in Chu River flood plain. Forest pathology surveys conducted during 1994-2008 revealed centers of willow cicada (*Aphrophora salicina Goeze*). In addition, high prevalence of suctorial insects - louses (*Aphidinea*) and coccidis (*Coccinea*) is reported. Due to mass reproduction of these pests willow in the flood plain dried at the area of more than 100 ha. There are the same upset flood-plain plantations in Tyup forestry. At the territory of Jergalan forestry (Karakol forestry) and in Kochkor forestry there are

centers of mass reproductions of several species of geometer (*Geometridae*) gnawing away leaves of Chinese elm– *Ulmus pinnato-ramosa* Dieck. (karagach). In Chui forestry and in the National park “Kemin” in 50-year old introduced Siberian larch (*Larix sibirica* Ldb.) the centers of mass reproduction of larch moth (*Coleophora sibirica* Falk.) is reported. The outbreak lasts for 7 years already. Drying of trees is observed.

Annex H. Vertical zoning and landscape types.

Vertical zonation is a main regularity identifying distribution of soil, flora, fauna and landscapes in Kyrgyzstan. There are four main types of vertical zonation: **northern-Tien-Shan type**, that is peculiar to northern KR rayons with lower cold-temperate vertical zonation; **southwestern-Tien-Shan type**, that is peculiar to Talas and Fergana ranges with transitional subtropical environment; **internal-Tien-Shan type**, that has specific territory surrounded by the ranges of mountains and located at high altitudes under dry climate conditions; and **Turkestan type**, that is peculiar to the southern ranges of Kyrgyzstan with peculiarities of subtropical landscapes.

Northern Tien-Shan

Lower zone of northern-Tien-Shan type of vertical zonation is presented by piedmont semideserts located at the height up to 900-1200 m. Sloping plains with deep detrital cones prevail within the landscape. Soil is sierozomic. Natural land cover is usually negligible and consists of wormwood, mat-grass and ephemers. In early spring ephemers create a low green herb layer and in early summer they fade. There are small forests consisting of poplar and willow, brushwoods called as “tokoi” within overflow lands. There are some places of groundwater discharge forming swamp lands.

Next zone – *mountain & steppe zone* – occupies foothills and low-hill terrains with a height up to 1500-1800 m. Dry steppes with mat-grass, fescue grass and wormwood at mountain light-chestnut soil prevail within lower belt. Upper belt is occupied by fescue- & mat-grass steppes at mountain liver-coloured and chernozem soils. Cropping capacity of the steppe herbage is 10-12 centners/ha of dry mass what contributes to their wide use under late-spring and summer pastures.

There is a *forest-meadow-steppe zone* at the height from 1400-1500m to 2500-2800 m. It occupies medium mountains with steep lands and gorges. Meadow steppes with mountain chernozem soil, brier & barberry shrubs and leaf forests of apple trees, dried apricots and aspen trees are peculiar to lower belts of this zone. Coniferous forests consisting of Tien-Shan fir and Semenov’s silver fir prevail in the upper belts of the zone. Forests are mainly confined to valley sides and northern slopes of the ranges. Altogether fir forests occupy 12% of KR forest area.

Plenty feedstuff, conditions for taking shelter, moderate climate are favourable base for a big number of gnawing animals, hoofed mammals, predators and birds. Brown bear, lynx and wild boar are found here. The upper belt of forest zone is combined with sub-alpine meadow vegetation. Trailing shrubbery is found here as well. At large forest-meadow-steppe zone combining various vegetation species is of high aesthetic value.

Zone of Alpine meadows & meadow steppes is at the height from 2600-2800 m. It occupies the upper belts of the ranges, head rivers with ancient-glacial relief forms. Rocks are usually found there. There are three belts within this zone – sub-alpine, alpine and subnival belts. Sub-Alpine meadows are tallgrass and rich in species composition. Alpine meadows are characterized with sort grass. Fragmental development of land cover is usual for subnival belt. Large areas are occupied by rock outcrops, tumble of lichen-covered rocks. Clumps of alpine vegetation are seldom found there. Soil is lithogenic and usually it has a high concentration of crushed stone.

The upper belts of the ranges at the height from 3600-3800 m are occupied by *nival-glacial zone* – zone of permanent snows, eternal ice and rocks. There are only lithophilous lichen and algae on stones.

South-western Tien-Shan

South-western Tien-Shan belt of vertical zonation is confined to the boundary with subtropical belt and therefore is different from the northern-Tien-Shan one especially in the lower layers. At the foothills of Western Tien-Shan there are widely distributed semideserts with prevailed ephemers and ephemeroïds within common sierozems at the height where they are transferred into ephemeroïd quack- & blue-grass communities with tall-grasses on dark sierozems. In spring semidesert vegetation blossoms out but then fades very soon and semidesert obtains a yellow-grey coloration. Pistachio, common almond and dense clumps of bushes can be found in some places.

Leafed forests prevail in *medium-mountain & forest-meadow-steppe zone*, fir forests and silver fir forests occupy a small area within the upper belt of this zone. The peculiarity of this zone is a compound combination of varieties of meadow steppes, archa thin forests, walnut and fir forests, clumps of bushes. Just at that spot, there are basal areas of unique old-growth walnut forests located at the height of 1500-2800 m of western and southern slopes of Fergana and Chatkal ranges. Up to 130 species of trees and shrubs including European walnut, pistachio, almond, pear, apple and other species are found in these forests. Forests are notable for multilayer state and various undergrowth shrub layers. Black & brown soil is formed under walnut forests.

Either *dark coniferous forests* or *juniper stands* are usually take place above the belt of walnut forests. It is important to note that juniper is widely distributed throughout the Kyrgyz Republic. Juniper forests of tree-like types – Turkestan juniper, hemispherical juniper, Zeravshan juniper, and more rarely Talas juniper – are found at wide altitudinal belts at a height of 1200 - 3000 m and occupy more than 40% of all forests in Kyrgyzstan. Mostly they are dry, lighted, relatively stunted forests that often pass to the open woodland. Juniper elfin woods scattered among steppe and meadow vegetation are formed at forest line.

Internal Tien-Shan

Desert and steppe zones prevail in spectrum of vertical zonation of Internal Tien-Shan. Here, at the height of 1500 m peculiar stone deserts with open vegetation are spread. Higher, large areas are occupied with dry and true steppes in which fescue, feather grass and sagebrush prevail. Mostly they occupy middle-mountain areas. Soils of these steppes are light-chestnut thin soil and dark-chestnut soil.

Mountain meadows and meadow steppes occupy large areas in this spectrum of vertical zonation. Fescue, feather grass and different sedges prevail. Saz-meadows transferring into bogs in some areas are typical for overflow lands river valleys. Meadows, meadow steppes and steppes serve as good summer pastures – djailoo. Many of these pastures are considered one of the best pastures in Central Asia.

High-mountain meadows and meadow steppes are often substituted by peculiar landscapes of cold high-mountain desert. Short vegetation period, constant frosts, strong winds of this area impede development of vegetation cover.

Cold desert is characterized with high-mountain takyr-like soils. Deserts are located at the most severe areas of szyrty plain – peaks and windward slopes of coteaus. Lower and wind-protected areas are covered by sedge and meadows. Stony tundras with open vegetation are located above the high-mountain deserts. Nival and glacial landscapes occupy large areas in the spectrum of Internal Tien-Shan.

Turkestan zone

Mountains of Turkestan zone of Kyrgyzstan have much in common with South-western Tien Shan. In this area lower belt is occupied with subtropical semideserts of piedmont plains and adyrs with ephemeral and sagebrush-ephemeral vegetation on grey desert soils. At higher areas they are replaced by subtropical tallgrass steppes in which pistachio, bushes, particularly pearl-bush and brier are often found. As opposed to Western Tien Shan forest-meadow-steppe zone does not have dark coniferous forests, and juniper forests are widely spread.

Degradation of mountain landscapes is noted due to their wide use as pastures. This is evinced in impoverishment of vegetation species composition, appearance and prevalence of weed and venomous species, reduction of yields, appearance of denuded soils, erosion scours and hollows. Activation of exogenic processes, that often have a disastrous character – mudflows, avalanches, landslides, is also noted.

Annex J. Annual distribution of reforestation

Species	Total	Annual plan of plantation (ha)				
		2009	2010	2011	2012	2013
Poplar	6250	450	1400	1850	1350	1200
Fruit trees	790	120	180	200	200	90
Willow	380	80	100	100	100	
Elm	500	80	200	100	100	20
Subtotal for fast-growing trees	7920	730	1880	2250	1750	1310
Spruce	2000		500	500	500	500
Juniper	1000		250	250	250	250
Pine	500		125	125	125	125
Walnut	250	50	50	50	50	50
Pistachio tree, almond tree	1000		250	250	250	250
Saxaul	1000		250	250	250	250
Others	280	50	50	80	50	50
Subtotal for slow-growing trees	6030	100	1475	1505	1475	1475
Total	13950	830	3355	3755	3225	2785
Percentage	100%	6,0%	24,0%	26,9%	23,1%	20,0%

Annex K. Social component

Social assessment based on social survey results

1 Tasks and objectives of the survey

The objective of this study is to perform environmental and social assessment of current environmental situation, problems of nature management by local communities, to determine importance of forest resources for the households and to analyze forest resources users in each target settlement, along with the identification of possible alternative types of activities of the population intended to reduce the level of poverty.

Tasks: to identify environmental and social risks of proposed project impacts and to establish a baseline for poverty along with the relevant social and economic indicators, to determine the measures for prevention, liquidation or minimization of any assumed negative impacts.

2. Methodological instruments of the survey

1. In-depth interview with community members. 275 respondents living in rural settlements of proposed project area of Tien Shan Ecosystem Development Project were surveyed.
2. Focus groups. Focus group discussions with the representatives of stakeholders, including the presumably project impacted representatives of farms (men and women), the representatives of local administration, non-governmental organizations, science, as well as business entities were conducted. 8 focus groups were conducted with the villagers of Chui, Talas, Issyk-Kul, Jalalabad, Batken, Almaty and South-Kazakhstan oblasts.
3. Expert interviews. 35 interviews were conducted with the representatives of ministries, agencies, international organizations, local administration, scientists, forestry, national parks and reserve area specialists, NGO and business representatives.
4. Analysis of the documents. Study of statistical data obtained from ayil okmotu in KR, akimats in the Republic of Kazakhstan, ARIS study results and the results of implementation of transboundary project of WB on biodiversity conservation in Western Tien Shan.
5. Desk study. It was conducted to study social and cultural and institutional problems in the field of forestry of the Kyrgyz Republic.

Data collection

Collection of baseline data for the study was performed from October 23 to November 20 2008.

3. Topics of the questions

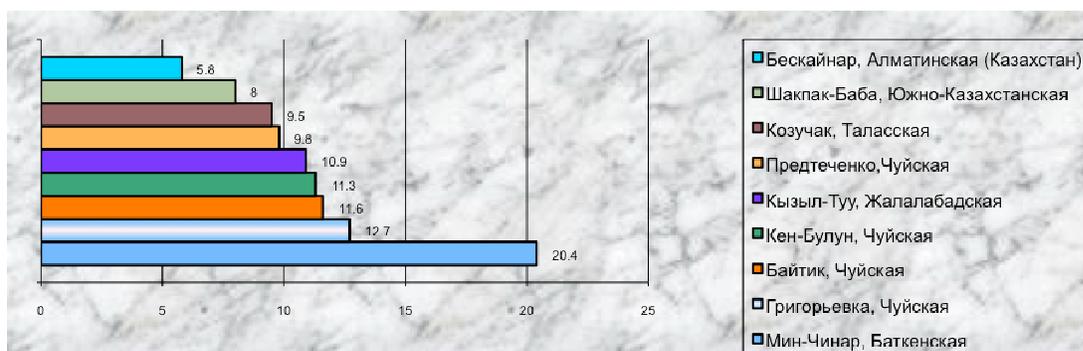
Familiarization meetings preceded the survey of the villages. Those were aimed at the familiarization of local public administration (ayil okmotu), rural leaders and the population with study tasks and objectives and at the discussion of local problems along with the identification of possible ways of addressing those. The range of concrete issues to be discussed during focus groups was defined. Assessment of willingness and ability of the population to perform certain activity on the transformation of the economic or environmental situation was made. The attitude of local population to the proposed TSED project, potential risks and mitigation measures were determined.

4. Qualitative and quantitative composition of the participants

Approximately equal representation of men and women was observed in almost all groups. The respondents represented all groups of the population and the society. The representatives of rural intelligentsia, farmers, lessees, unemployed, public servants, NGOs, businessmen and housewives took part in the survey. Thus, expert analysis was supported by the opinions expressed by the respondents during focus-group discussions and interviews with the representatives of local administration, researchers, LHs' and national parks' specialists, NGO and business representatives.

Territorial distribution of the respondents was the following: the largest number of respondents was observed in Batken oblast – 20.4%, while the least number – in Almaty oblast (Kazakhstan) – 5.8%.

Diagram K1



5. Territorial features of settlement sampling

The project area is characterized by the diversity of natural and anthropogenic conditions, so for in-depth study of the range of possible conditions of project implementation village sampling was made based on natural and territorial features.

The settlements that represented the following were covered with the survey:

1. Different environmental conditions,
2. Areas representing various rates of precipitation (from 200 to > 1000mm per year),
3. Areas that are of great interest from the perspective of environmental safety,
4. Areas with different degree of economic development,
5. Settlements located near protected areas,
6. Settlements located in the areas with different degree of degradation of the environment.

The villages selected for the survey are located within project area and in accordance with administrative division belong to Batken, Issyk-Kul, Jalal-Abad, Talas and Chui oblasts of the Kyrgyz Republic, as well as to South-Kazakhstan and Almaty oblasts of Kazakhstan (Table 1).

Table K1

Villages sampling for the survey

Village, oblast	Ecosystem	Degree of moisture	Degree of development	Degradation of the environment	Importance of environmental safety	Special protected area
Grigorievka, Issyk-Kul	Anthropogenic and lakeside	Average	Average	Insignificant waterlogging	High	Biosphere reserve Issyk-

						Kul
Min-Chynar natken	Anthropogenic	Low	High	Salinization and waterlogging	High	
Kyzyl-Tuu Jalal-Abad	Walnut and fruit forests	High	Average	Deforestation	Special importance	Sary-Chelek reserve
Kozychak Talas	Anthropogenic and mountain-steppe	Average	Average	Salinization	High	National natural park Besh-Tash
Ken-Bulun Chui	Anthropogenic	Low	High	Waterlogging	High	
Baitik Chui	Anthropogenic, mountain-steppe and riparian forest	Average	Average	Reducing of biodiversity and productivity	Special importance	National natural park Ala-Archa
Predtechenko Chui	Anthropogenic	Low	High	Salinization	High	
Vysokoye South-Kazakhstan	Anthropogenic and mountain-steppe	Low	Average	Reducing of biodiversity and productivity	Special importance	Reserve Aksu-Jabagly
Beskaynar Almaty	Anthropogenic and mountain-steppe	Average	Average	Underflooding	High	Ile-Alatau national natural park

Contacts with local authorities were established in each settlement, and meetings with local residents, NGOs and rural communities were conducted. Tasks and objectives of the project in general and social and environmental survey in particular were explained during these meetings. In each surveyed settlement the information was collected that included some aspects of nature management and related environmental problems.

The process of discussions revealed understanding and high interest of the population in TSED project implementation. As the results of social survey have shown, rural population supports TSED project with enthusiasm, and would like to have an opportunity to cultivate fast growing wood species and fruit trees at their land plots and at the land adjacent to their farms within the frame of the project. This support, and especially the one provided from the part of poor population, will facilitate employment, poverty and migration reduction, and, undoubtedly will allow reducing the volume of illegal cutting.

Assessment of forest plantation condition

To evaluate the condition of forest protection plantations: forest belts along the roads, shelter belts and garden-protection belts, as well as forest plantations on the banks of the rivers and water bodies, the respondents were asked to answer the relevant questions. Thus, overwhelming majority of the respondents in the villages of Chui oblast (61 - 74,2%) reported about worsening of the situation; In Talas oblast – 80.8%, in Issyk-Kul oblast – 74.3%. Only in Jalal-Abad oblast, Kyzyl-Tuu village, where with the support of Small Grants Program of the project on conservation of biodiversity of Western Tien Shan plantations of fast-growing wood species provided improvement, worsening of the situation was reported only by 41.8% of the respondents. Reduction of forest plantation areas was reported by 40 to 50% of respondents in Kazakhstan. In Kyrgyzstan, excepting Batken oblast, where the respondents reported about increase of forest plantations area (62.5% of surveyed), worsening of the situation with forest plantations was reported by the respondents of all regions (72 – 93.5% of respondents).

Assessment of pastures condition

58.9% of surveyed respondents from Min-Chinar village, Batken oblast, reported about improvement of the situation with the pastures. Positive opinion was expressed by the respondents from Kozychak village, Talas oblast - 65.4% of respondents; Grigorievka village, Issyk-Kul oblast – 68.6%, Kyzyl-Tuu village, Jalal-Abad oblast - 69% and in South-Kazakhstan oblast. Overwhelming majority of the respondents in Chui oblast, in the villages Baitik – 81.3%, Ken-Bulun – 78.6% and Predtechenko – 59.3%, reported about worsening of the situation.

Sharply reduced number of livestock in the republic occurred recently did not resolve environmental problems related to grazing of animals on pastures. Only remote outruns were released from excessive load, where small farmers did not migrate. Livestock owners do not have an opportunity to take their animals to remote outruns in a view of the lack of transportation means and funding. All animals are kept at spring-autumn pastures located near the settlements, which at the moment experience much heavier overgrazing than before. This disproportion of pastures operation causes further degradation of those pastures that are located near the settlements. As the experience of the implementation of Small Grants Program (SGP) of the project on biodiversity conservation in Western Tein Shan shows, involvement of local communities to pasture management along with establishment of rural pasture committees that would participate in the management together with local administration to join their efforts to find the ways of rational use of all pasture resources may improve the situation. It is feasible to disseminate this experience to the project area. Land of degraded pastures could be used for reforestation and for creation of fast growing wood species plantations.

Use of energy sources

Energy sources for heating and cooking

Practice of various energy sources use for heating and cooking depends on the region. From 55.6% to 65.6% of the respondents in three villages of Chui oblast use power more often, while from 58.1% to 66.7% of respondents use firewood. In Talas oblast firewood is used more often by 84.6% of respondents, while pressed dung – by 50% and other sources – by less than 50%. In Issyk-Kul oblast coal is used more often by 88.7% of respondents, while firewood – by 71.4%. The highest level of firewood use is reported in Jalal-Abad oblast – 100%, where poverty level is the highest. High level of firewood consumption was reported in Batken oblast – 76.8%, gas – 53.6% and other sources made up less than 10%. In South-Kazakhstan oblast firewood is used by 93.8% of respondents, while pressed dung – 87.5%, coal – 50% and gas - 18.3%. In Almaty oblast coal is used by 90.9% of respondents, power, pressed dung and firewood – by 36.4% and gas – by 9.1%.

Thus, the results of social survey have shown that in all oblasts firewood is preferable type of fuel, excepting Issyk-Kul and Almaty oblasts, where coal is used most of all.

Firewood stocking by the households

Survey results have shown two leading trends in the practice of firewood stocking by Kyrgyz citizens. The first group of respondents stocks firewood on the land adjacent to the farms and other possible places and thus has free source of heating. The second group has to buy firewood at the markets.

In Chui oblast, overwhelming majority of the respondents buy firewood (59.3% to 83.9%).

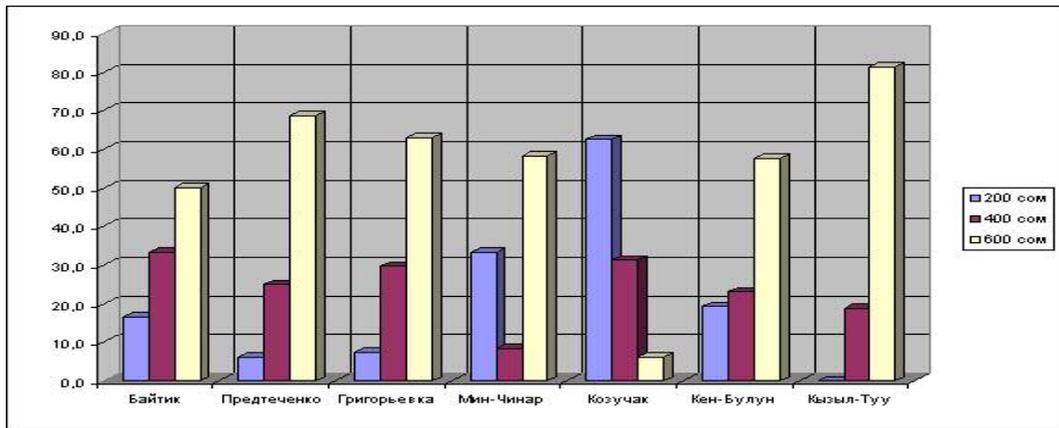
In Talas oblast firewood stocking is made from two sources. 61.5% of the population cut trees, while the same number of people (61.5%) purchase firewood. The situation is about the same in Issyk-Kul oblast. People stock up firewood in the gardens – 45.7% and buy – 77.1%. There is different situation in Jalal-Abad oblast, where people stock up firewood in the forest – 70%, and buy – 53.3%. Less firewood is stocked up in Batken; 21.4% of respondents in Batken oblast buy

firewood, 23.2% stock up firewood in the forests, 21.4% stock up firewood in forest belts and 35.7% - in the gardens. In Almaty oblast -12%, and in South-Kazakhstan – 10%, respectively.

Firewood stock up with the purpose of further sale remains beyond the field of vision being about 60 -70% of all firewood used by the respondents for heating and cooking. Sale of firewood became a livelihood for certain category of rural population. Arrangement of trees planting for this category of rural citizens would allow reducing spontaneous deforestation and providing livelihood for these people.

Diagram K2.

Distribution of the respondents with different income buying firewood



Volumes of firewood and timber use

To evaluate annual consumption of firewood, the respondents were offered a scale that measures firewood consumption in cubic meters. In Chui oblast, from 21.9% to 45.2% of the respondents stock up in average 2-4 cubic meters of firewood. In Talas oblast – 34.6%, in Issyk-Kul oblast – 37.1%, in Jalal-Abad oblast 46.7% and in Batken oblast – 37.5% of respondents stock up 0-2 cubic meters. In Kazakhstan, 100% of surveyed respondents stock up from 0 to 2 cubic meters of firewood.

To evaluate annual consumption of construction timber, the respondents were offered a scale in cubic meters. The volume of construction timber is higher than the volume of firewood used, according to the survey results. In Chui oblast from 11.9% to 19.4% of surveyed respondents in average stock up more than 4 cubic meters of timber. In Talas oblast – 53.8%, in Issyk-Kul oblast 17.1% of respondents stock up 0-2 cubic meters, in Jalal-Abad oblast 46.7% of respondents stock up 0-2 cubic meters. While in Batken oblast – 14.3%. In Kazakhstan, to satisfy the demand for timber, 14% of the respondents stock up 0-2 cubic meters, while 40% need 2-4 cubic meters, and 40-60% of surveyed respondents need 4 cubic meters.

Thus, the survey results have shown that high prices for coal and gas make these energy sources unaffordable for many rural residents, so there is growing demand for firewood for heating and cooking.

Social survey and individual interview results have also shown that the demand for construction timber grew up.

The main problems hindering increasing of forest plantations area

The results of social survey have shown that expensiveness of traditional fuels (coal, gas and power) caused the use of more accessible fuel, such as firewood. Not protected forest shelter belts, gardens of former kolkhozes and sovkhoses have become a place of illegal firewood stocking during recent years, in this view, their condition got deteriorated almost everywhere. The demand for firewood used for heating and cooking grows. The demand for timber for construction also grows.

The main reasons that do not allow to widely expand forest plantation area on the lands that are not used for agricultural crops cultivation are the following: lack of spare lands, lack of funding for long-term investments, problems with purchasing young plants, lack of knowledge, lack of irrigation water, lack of fencing for plantations, growth of the number of livestock.

To identify the most important problems hampering expansion of forest plantations area, the respondents ranged the problems from proposed list for importance.

To identify the problems, respondents were offered 7 main problems hindering expansion of forest plantation area.

1. Lack of spare lands
2. Poverty of the population
3. Problems with purchasing young plants
4. Lack of knowledge
5. Lack of irrigation water
6. Lack of fencing for plantations
7. Growth of the number of livestock

Based on survey results, several main problems hindering expansion of forest plantations area may be identified.

Lack of spare lands

According to survey results in Chui oblast, 40.6% of the respondents of Baitik village reported about the problems related to purchasing of the young plants as the main problem; and 48.1% in Predtechenko village reported about the problems with purchasing of the young plants. 51.6% of respondents in Ken-Bulun village reported about the lack of spare land. The lack of spare land was reported as the main problem by 53.8% of respondents in Talas oblast, by 48.6% of respondents in Issyk-Kul oblast, 46.7% - in Jalal-Abad and 48.2% - in Batken oblast. In South-Kazakhstan oblast – 50%, in Almaty oblast – 87.5% from total number of respondents.

However, effective and proper use of the land adjacent to the farm, the land unfavorable in land-reclamation sense and rational selection of wood species would allow increasing plantations area. According to survey results, from 31.3% to 63% of surveyed respondents in Chui oblast stock up firewood and timber in the gardens, 61.5% - in Talas oblast, and 45.7% - in Issyk-Kul oblast, 35.7% - in Batken oblast, while 13.3% – in Jalal-Abad oblast and in South-Kazakhstan oblast – 87.5%, in Almaty oblast – 54.5% respectively. The given data is evidence that under favorable conditions the volume of wood species grown at the land plots could increase.

The lack of spare lands could be compensated due to unused lands. It is required to conduct analysis of land resources available with AO that were not transferred to private property after the privatization (land shares). Rural residents have two options of obtaining AO lands for growing trees.

The first option is to obtain the land from ALRF fund having a status of permanent plantations. However, not all AO have such a fund. These lands could have been transferred to the villagers on competitive basis. The form of land transfer should be arranged both on individual, and on group basis. This would considerably increase land resources intended for trees cultivation.

Another option is to develop non-productive lands. In this case rural residents will obtain additional land plots. In both cases it is necessary to conduct analysis of deserted, unused lands, its condition for suitability for growing trees. This is supply of irrigation water, ability to install

fencing and etc. This is also an additional resource to increase the area transferred for trees cultivation.

Thus, searching of additional land resources for plantations of fast growing wood species should be made in two directions. The first one is to effectively use available land resources intended for growing permanent wood species. There is a need to develop simple and understandable for rural residents evaluation criteria for the lands to be used for gardens and permanent plantations. Another direction is to develop new low-productive lands.

Knowledge on fruit trees cultivation

Another important reason is lack of knowledge on fruit trees cultivation in several regions. Thus, according to survey results, from 14.8% to 55.2% of surveyed respondents reported that they did not know how to grow fruit trees in Chui oblast. In Talas oblast only 7.7% of surveyed respondents did not know how to grow, 14.3% - in Issyk-Kul oblast, 46,7% and 12.5% of surveyed respondents in Jalalabad and Batken oblasts respectively. In South-Kazakhstan oblast and in Almaty oblast –from 70 % to 86.7% of the respondents were lacking knowledge on this matter. This situation provides the ground for making a conclusion that it is necessary to arrange the trainings, or to distribute special literature there.

Upgrading of the knowledge on fast-growing trees cultivation

According to survey results, there is greater knowledge on growing fruit trees in surveyed respondents than the one on fast growing wood species. In Baitik village, Chui oblast – 71% of the respondents, in Ken-Bulun village – 65.5%, in Predtechenko village – 40.7%, in Talas oblast – 23.1%, in Issyk-Kul oblast – 47.1%, in Jalal-Abad – 53.3% and Batken oblasts – 14.3% of the respondents honestly reported that they did not know how to take care of fast growing wood species. There were 35% of those in South-Kazakhstan oblast, while in Almaty oblast of Kazakhstan – only 12.5% from total number of respondents.

Lack of knowledge causes big losses when planting trees. According to survey results, 46.7% of respondents from Baitik village, Chui oblast, reported that only 25% of planted trees survived, 31.5% of respondents in Ken-Bulun village reported that only half planted trees survived, while in Predtechenko village – only 61.5% said so. 73.1% of surveyed respondents in Talas oblast reported that 50% of planted trees survived. 80% of respondents in Issyk-Kul oblast reported that only 25% of planted trees survived. 43.5% of surveyed respondents reported that 50% of planted trees survived in Jalal-Abad oblast, and 73.5 % of respondents in Batken oblast reported that 100% of planted trees survived. In South-Kazakhstan oblast 95% of respondents answered that half of planted trees survived, while the same percentage was reported in Almaty oblast by 76.9% of surveyed respondents.

Arrangement of the consultations for interested rural residents, sharing of successful experience on planting forest protection plantations between villagers from different regions involved in will facilitate increase of plantations and further supply of wood volume for economic activity.

Quality of planting stock

The fact that many surveyed respondents buy planting stock not in specialized organizations (nursery forests, LHs), but at the markets may also be indicated as one of the obstacles. This causes bigger losses when planting trees due to poor quality of planting stock. Thus, according to survey results, 74% of respondents in Chui oblast buy planting stock at the markets, 84.6% do so in Talas oblast, and 76.8% - in Batken oblast. Completely different situation is observed in Issyk-Kul oblast, where 82.9% of respondents buy planting stock in the LHs, and 53.3% do so in Jalal-Abad oblast. If in Kyrgyzstan planting stock is mainly purchased at the market, in South-Kazakhstan oblast, 15.9% of respondents buy from neighbors and acquaintances, and 27.5% of respondents do so in Almaty oblast.

The respondents growing young plants as a source of income, stock up firewood in the forest 2-3 times less. This is 13.9% of residents, according to survey results. Those respondents, who reported that they had livestock as the main source of income stocked up firewood in the forest in 53% of cases. Unambiguous conclusion can be made that the more trees people grow, the less harm they make for the environment. To a greater extent the demand of households for firewood and timber is satisfied due to own sources, the fewer trees are cut in the forests and forest belts.

Nursery forests located within the LHs and in natural parks are the main sources of planting stock. However, according to the results of the meetings with local community representatives, individual interviews and consultations with local administration, specialists and NGOs, it is evident that those nursery forests that are currently available are not sufficient to satisfy growing demand. It is not enough planting stock of guaranteed quality from the nursery forests both in Kyrgyzstan, and in Kazakhstan, according to the respondents.

At the same time, the staff of LHs during the meetings and individual interviews reported that nursery forests due to the lack of funding, fertilizers and machinery produce planting stock with lower quality than the one of private nursery forests, that is why it is difficult to sell and it stays in the nursery forests forming thicken overgrown plantations of planting stock. Sometimes nursery forests cannot sell young plants due to the lack of advertising. So, capacity building and training of the personnel of nursery forests and national parks on marketing and advertising of products are required for successful competitive operation of nursery forests of the LHs and national parks.

For rural residents interested in cultivating gardens and fast-growing wood species plantations consulting support needs to be arranged during the first year of young plants cultivation. This would allow increasing the number of survived young plants and to reduce the costs.

Fencing of the plantations

The problem related to fencing of young plantations from the damage caused by cattle is one of the reasons constraining and hampering increase of plantations area, according to rural residents. The problem is, according to them, that fencing should be made of metal wire mesh, or from barbed wire, and not of wooden material. This is expensive for the majority of the respondents due to their low income and poverty. At the same time, the residents of some regions successfully use plantations of thorny shrubbery for fencing (such as sea buckthorn, dog-rose, raspberry), which with informing and sharing of experience and training could be successfully used when planting new forest plantations.

Growth of the number of livestock

Another factor hindering growth of the number of planted trees is the growth of livestock. Thus, according to survey results, 70% of respondents in Chui oblast believe that the number of livestock increased, while 69.2% - in Talas oblast, 75.9% - in Issyk-Kul oblast, 64.3% and 58% in Jalal-Abad and Batken oblast respectively were of the same opinion.

This is the opinion of half of the respondents in Chui oblast, 76.9% - in Talas oblast, 79.4% - in Issyk-Kul oblast, 58% and 55% - in Jalal-Abad and Batken oblasts respectively. In South-Kazakhstan oblast – 53%, in Almaty oblast – 48%, respectively.

Livestock breeding became one of the main sources of income during recent years. According to survey results, from 32.3% to 65.6% of respondents reported livestock breeding as the main source of income in Chui oblast. In Talas oblast – 69.2%, in Issyk-Kul oblast – 60%, in Jalal-Abad oblast – 73.3% and in Batken oblast – 73.2%. In South-Kazakhstan oblast and in Almaty oblast - from 77.3% to 81,3% of surveyed respondents.

Exchange visits between the villagers from neighboring settlements and sharing of experience on stocking pressed dung would allow reducing illegal deforestation and increasing the share of

this fuel source for cooking. Annual growth of the number of animals would facilitate successful introduction of the installations on biogas production.

Involvement of jaamats, farmers and other rural activists to society norms regulation (for instance, aksakal court) would facilitate access to forest resources and their participation in forest management and protection.

Poverty as the reason for deforestation

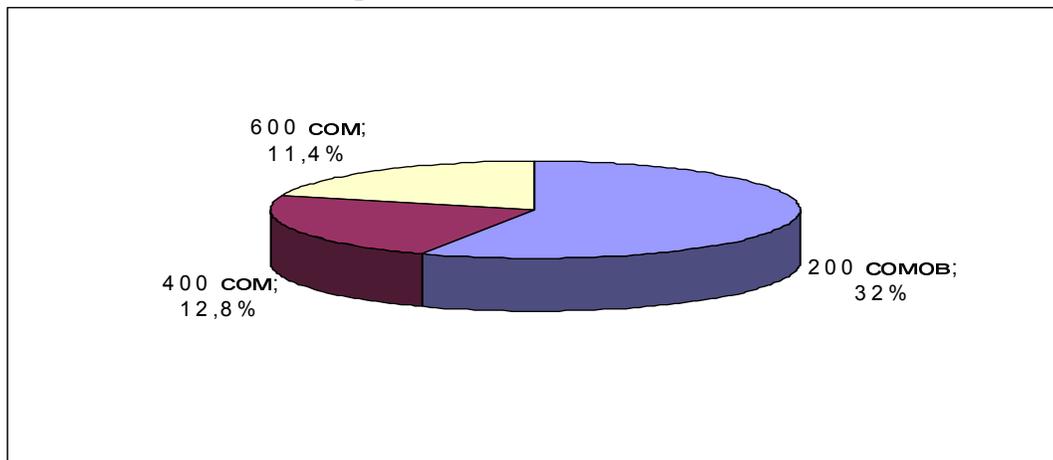
Poverty is also one of the problems causing deforestation. High price for such traditional fuel as coal caused the use of more affordable source, such as firewood. It is stocked up at the gardens, and as a result of illegal deforestation and felling of trees in forest belts.

According to survey results, about 20% of respondents had average income up to 200 soms per one family member, excepting Kozychak village, Talas oblast, where this indicator made up 60%

As it can be seen from the graph, the share of poor who stock up firewood in the forests makes up 33%, or 57% of illegal deforestation. In addition, analysis of survey results shows that less than 20% of households with less than 200 soms per one family member buy firewood. This group of rural population with the level of income of less than 200 soms is a potential threat of illegal deforestation. More than 20% of respondents with the income 400 and 600 soms buy firewood.

Diagram K3

Distribution of firewood stocking in the forest and in the forest belts between the respondents with different income level



Consulting support, training programs, allocation of land and effective use of land plots adjacent to farms would allow to increase the area under plantation of fruit trees and fast growing wood species and to satisfy the demand of poor for firewood and timber.

TSED project support of particularly poor population will facilitate employment, poverty and migration reduction and undoubtedly will allow reducing illegal deforestation.

Conflicts caused by natural resources use

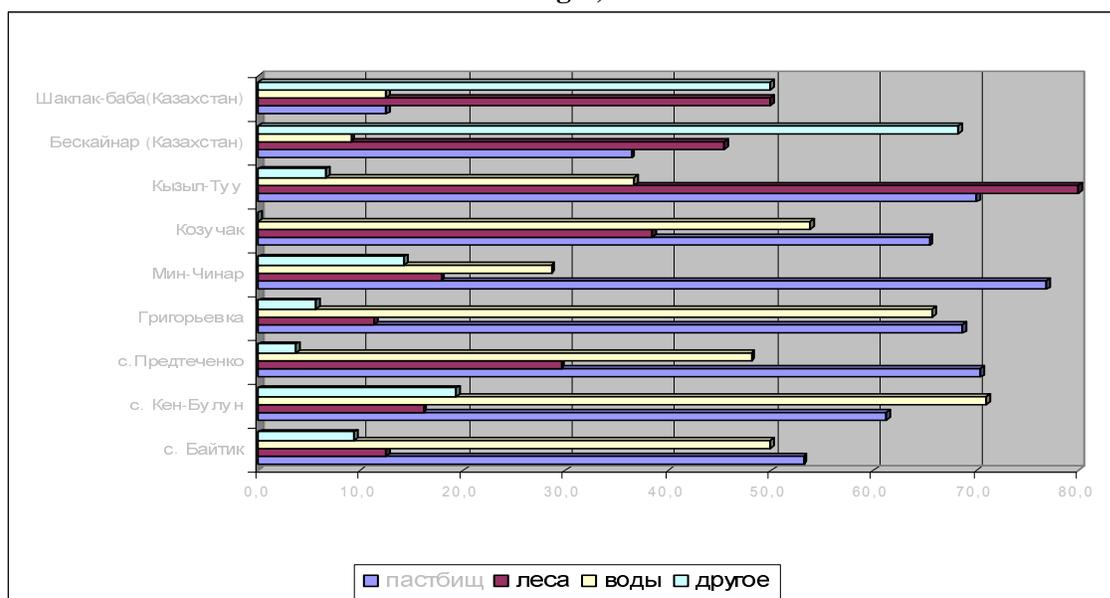
To assess the level of conflicts emerging between rural residents using natural resources, the respondents were offered to answer the question, which measure the subject, potential and possible ways of conflict resolution.

Different regions have their specific features due to geographic, economic and social conditions, which determine various conflicts in terms of topics and intensiveness. Restricted natural resources cause conflict situations, which determine emerging conflict situations since there is different access to natural resources with different groups.

According to survey results, the conflict caused by natural resources use is reported in relation to pastures, water shortage and forest (Diagram 5).

Diagram K4

Distribution of the level of conflict caused by natural resources use broken down by villages, %



According to survey results, the highest level of conflict is reported in relation to pastures in Min-Chinar village, Batken oblast, - 76.8% from total number of respondents, while the information from the bar graph shows its presence in all rayons of the KR and Kazakhstan excepting Shapak-Baba village, where only 10% of respondents reported about the conflict.

As it was mentioned above, the level of conflict due to the access to pasture resources may be reduced by more rational use of pastures (introduction of pastures turnover), involvement of the communities in pasture management, allocation of alternative land plots, cultivation of perennials on degraded plots and etc.

Water shortage is second common cause in terms of conflict level – from 28% in Batken oblast to 70% in Chui oblast. Low level of conflict in relation to water is reported in South-Kazakhstan oblast – 12.5%, and in Almaty oblast – 9.1%.

The highest level of conflict is reported in Ken-Bulun village due to under flooding. Excessive water causes under flooding of the houses, which causes damage not only to economic activity, but also to human health. However, this is favorable condition for cultivating fast-growing wood species.

In the rest cases conflicts emerge due to water shortage. As a rule, conflicts are being resolved with the participation of local administration, which establishes irrigation schedule for the land plots of the households and observes its implementation. To resolve the conflicts, so-called

water committees are being created in some villages with the participation of community representatives.

As it was mentioned above, restricted access to such resources as firewood to heat dwellings and to have timber as construction material causes conflict situations.

The forest is second common cause of conflict. The level of conflict here is lower, excepting Jalal-Abad oblast, Kyzyl-Tuu village. This village is located on the territory close to walnut-fruit forest. The highest conflict level (80%) is reported in this village.

Activities for the development

According to survey results, the respondents indicated three types of activities as priority ones. These are traditional activities – livestock breeding, agriculture and plant cultivation. However, existent distinctions defined by geography of the settlement should be considered when selecting priority activities. In flat country agriculture and plant cultivation are prevailing activities. Livestock breeding prevails in mountain zones. These are the most important sources of income for the households.

Table K2

What types of activities could be developed in your village

Activities with development perspectives	Chui oblast	Talas oblast	Issyk-Kul oblast	Jalal-Abad oblast	Batken oblast
Agriculture using modern technologies	58,6	84,6	62,9	36,7	64,3
Processing of fruit and berries	25,7	73,1	82,9	80,0	91,1
Processing of vegetables	33,9	46,2	45,7	36,7	44,6
Processing of livestock breeding products	37,1	53,8	37,1	53,3	25,0
Services	15,6	23,1	14,3	36,7	21,4
Ecotourism	27,6	34,6	48,6	73,3	26,8
National crafts and souvenirs	14,3	30,8	25,7	66,7	12,5
Beekeeping	20,7	30,8	57,1	70,0	16,1
Other	18,9	0,0	14,3	26,7	8,9

Such activities as tourism, crafts, trade and etc. are not priority ones due to low income generating capacity. Such activity as collecting is less attractive (to gather mushrooms, herbs, provision of seasonal and domestic services and etc.). There is a correlation between the activity and its level of income and geographical conditions of the respondents.

Cultivation of young plants for commercial and economic purposes is also a type of activity for the development. However, the lack or shortage of knowledge does not allow developing this type of activity. According to survey results, about 70-80% of the respondents in Kyrgyzstan consider this activity profitable; while 87.5 - 100% of surveyed respondents in Kazakhstan consider this activity very profitable.

Table K3

How do you estimate commercial cultivation of trees?

Village, oblast	Unprofitable%	Profitable%	Highly profitable%	Total%
Baitik, Chui	23,3	50,0	26,7	100,0
Kyzyl-Tuu, Jalal-Abad	36,7	40,0	23,3	100,0
Predtechenko, Chui	16,0	64,0	20,0	100,0
Grigorievka, Issyk-Kul	20,6	70,6	8,8	100,0
Min-Chinar, Batken	32,1	57,1	10,7	100,0
Kozychak, Talas	30,8	57,7	11,5	100,0
Ken-Bulun, Chui	17,2	62,1	20,7	100,0
Beskainar, Almaty	6,3	6,3	87,5	100,0
Shakpak-baba, South - Kazakhstan	0,0	0,0	100,0	100,0

Those respondents who buy firewood for heating and cooking are of the same opinion. So, in addition to reforestation and creation of fast-growing wood species plantations on the land of aiyl okmotu, it is feasible to include the support of fruit trees and fast-growing wood species plantations by local population on the lands belonging to local population into the project activity.

Conclusions

Social survey results obtained based on analysis of opinions expressed by the respondents in focus group discussions and individual interviews with the representatives of local administration, researchers, specialists of the LHs and nursery forests, national parks and reserves, representatives of NGO and business, discussions with community members during the meetings.

These results are evidence of understanding and concern about environmental problems and related felling of trees and shrubbery, pastures degradation, salinization and waterlogging processes, increase of the area of unfavorable and degraded land. As field study results show, land unfavorable in land-reclamation sense is available practically on the territory of each aiyl okmotu and akimat.

Data analysis clearly shows that environmental problems and sustainable development may automatically be solved through growth of income, poverty and appearance of alternative livelihoods.

Poverty is one of the main problems causing deforestation. High price for such traditional fuel as coal and gas caused the use of more affordable source, such as firewood. Non-guarded forest protection plantations, gardens of former kolkhozes and sovkhoses recently became a place of illegal firewood stocking; in this view, its condition worsened almost everywhere. The demand for firewood for heating and cooking grew up. The demand for timber is also grew up.

Survey results have shown that rural residents that cultivate trees to satisfy their own needs for firewood and timber stock firewood and timber in the forest less; the more trees are grown by the villagers, the less damage people cause for the environment.

As survey results show, conflicts caused by the use of natural resources between rural residents mainly emerge in relation to pastures, water and forest. At the same time it should be noted that upon the implementation of proposed project the risk of aggravation of these conflicts appears. Thus, the conflicts may emerge due to expansion of the area of forest plantation, since it may cause certain reduction of pastures area, which will directly impact the interests of pasture users. There is a risk of conflict between the two main groups. This is the group of pasture users who are striving to increase pastures area due to the fact that from year to year the number of animals increases. On the other hand, there are interests of villagers wishing to deal with forest

plantations creation. The livestock will be the main threatening factor for the plantations, which means that the interests of forest growers will be impacted too. Partially, this may also be relevant to haying. At that, as the survey results have shown, these are the lands in the vicinity of the settlements of common use. So, **selection of land plots for forest plantations requires special grounding.** It should exclude the risk of damaging anyone's interests and conflict emergence. The search of compromise settlement of potential conflicts is seen in conducting wide awareness and education campaign, involvement of rural residents into the discussion and development of preventive measures, forest plantation management with the participation of not only groups of pasture users, but also the stakeholders interested in creation of forest plantations. It is also necessary to develop additional measures for pasture users – allocation of alternative land, arrangement of grazing on outrun pastures, installation of fences, provision of funding and etc.

There is also a risk of conflicts emerging due to shortage of the irrigation water, especially at those places where conflict level is high currently.

To eliminate conflict situations under the implementation of proposed project it is feasible to establish public “water committees” composed of farmers, public associations’ representatives, NGOs and etc. apart from local administration representatives.

Overwhelming majority of respondents sees the solution in attracting of local communities to natural resources use management, establishment of special structures to coordinate activity and to develop practices of rational use of all types of resources.

Both methods of natural resources use, and the implementation of protective measures for natural objects from negative man-caused impact depend on local communities.

Involvement of local communities to nature resources management, establishment of the committees, which together with local administration participate in the management and jointly find the ways for rational use of all resources, may improve the situation. It is feasible to disseminate this experience for project area.

Measures aimed at increasing the area of the new plantations

The use of unfavorable in land-reclamation sense lands and degraded pastures, which however could be successfully used within the frame of TSED project to create plantations of fast growing wood species could be recommended as the potential to expand plantation area.

To successfully expand plantations area of fast growing wood species and fruit species the following possible measures could be considered:

Actions aimed at capacity building of the leskhozoes and natural parks

1. To enhance the capacity of existing nurseries of the leskhozoes and national parks to produce bigger volume of the seedlings. Capacity building and training of the personnel of nursery of the leskhozoes and national parks on marketing and advertising of products are required for successful competitive operation of nurseries of the leskhozoes.
2. For rural residents interested in cultivating gardens and fast-growing wood species plantations consulting support needs to be arranged during the first year of young plants cultivation. This would allow to increase the number of survived young plants and to reduce the costs.
3. To support establishment of private nursery forests of fruit and fast-growing wood species. Currently existing nursery forests are insufficient. According to the respondents, it is not enough planting stock of guaranteed quality to satisfy the demand both in Kyrgyzstan, and in Kazakhstan. The number of private nursery forests is small; currently there is great potential for their development.

4. To support planting of fruit trees and fast-growing wood species by interested rural population at their land plots. The data given above is evidence that upon favorable conditions volume of wood species cultivated in the land plots may be increased.
5. To increase the number of people dealing with cultivating trees for commercial purposes. This business is considered profitable and very profitable by about 70-80% of the surveyed in Kyrgyzstan and very profitable by 87-100 % - in Kazakhstan.
6. To reduce losses of young plants when planting (these losses make up about 50%) due to the lack of knowledge of planting rules for both fruit and fast-growing wood species by conducting special training for interested rural population. To consider features of the area when developing measures (salinization, closeness to the forests, level of conflicts and etc.). To introduce limitations for grazing in the area adjacent to the settlements for the owners of large number of livestock (and goats in particular).
7. To envisage use of fencing for the new plantations. About 20-25% of respondents did not wish to cultivate trees due to the lack of fences. There are land plots, but those are not enclosed and that is why people do not want using them to plant trees. This is also a reserve to increase the area of plantations.

Measures aimed at enhancing the legislation

1. To reduce volumes of illegal deforestation with the purpose of further sale by means of enforcement of the legislative acts providing for responsibility for illegal deforestation. 60-70% of respondents buy firewood currently.
2. To involve organizations (LHs, nursery forests) and law enforcement agencies to toughen control over deforestation and sanitary felling with the objective of further sale.

Measures aimed at public involvement into the management

1. To involve interested rural population groups to plantation management (local jaamats, NGOs and etc.)
2. To involve the stakeholders into the measures on environmental monitoring.
3. To draw public attention through mass media to the problem of illegal deforestation (denouncing illegal deforestation in the forests and in the forest belts), to encourage cultivation of the young plants, plantation and etc.
4. To inform rural population at village meetings on the results of spontaneous felling monitoring and on project activity aimed at the restoration of the forests and forest belts and fruit trees plantations.
5. To develop education programs (trainings, workshops, round tables).

Measures aimed at the development of new activities

1. To develop new activities aimed at increasing income and poverty reduction. Poor population is the greatest potential threat due to the fact that they use illegal deforestation as the livelihood
2. To provide young plants for planting, to advice and to facilitate sales of grown plants and etc. for poor rural citizens.

Annex L Instruction on state environmental expert examination (1997)

5. EIA Procedure Stages

Stage 2. Environmental impact assessment.

This stage includes:

- collection and analysis of information on existing environmental condition;
- preparation of information on types of impact, its qualitative and quantitative parameters;
- detection of sources and objects of impact (their sizes, location relative to other sources, environmental objects);
- forecast of environmental changes and environmental components (water, soil, atmospheric air, flora and fauna, entrails etc.);
- technological decisions analysis including alternative options;
- assumed impact zone fixing;
- socio-environmental-economic analysis of intended project aspects (including alternatives).

The determination of project's impact and its alternatives on environment includes the following types of information and research:

- project implementation scale expediency and necessity justification;
- comparative technological and environmental-economic analysis of alternative decisions, their conclusions sufficiency justification;
- project implementation location and time justification
- availability of resources for main object (raw materials supply, power, natural resources, labour resources);
- technical analysis of design solutions with possible emergency risk analysis at all the stages of object construction, maintenance and liquidation. A technical characteristics sheet (*technological passport*) has to be drawn up on technical analysis findings;
- present condition of a planned object location environment.

The degree of completeness and sufficiency of information on the nature of environmental conditions in a specific territory must be considered from the standpoint of how well it has been scrutinized and its sensitivity to impacts. The sufficiency of survey must be determined at the site selection stage and implies the availability of information on the types and nature of intended impact.

The information must include the following components:

- a) land resources;
- b) climatic factors;
- c) soil factors;
- d) geological, hydro-geological factors;
- e) geo-morphological factors;
- f) hydrological factors;
- g) biological factors (fauna and flora);
- h) background value of contaminating substances in environmental components;
- socio-economic and business aspects of reviewed territory, which include the information on:
 - a) demography;
 - b) economy;
 - c) employment;

- d) historical and archaeological objects;
- e) infrastructure;
- f) transportation;
- g) public organizations;
- cost and benefits analysis;
- basic impact characteristics:
 - a) sources of impact;
 - b) spatial arrangement;
 - c) types of impact:
 - direct;
 - indirect;
- by type description of impact on humans, flora, fauna, soil, air, climate, landscape, tangible values and cultural heritage, and impact on interrelation of these factors;
- qualitative and quantitative impact indicators:
 - a) impact intensity (ingress of contaminants per one unit of time);
 - b) impact power density (ingress of contaminants per one unit of square);
 - c) impact frequency (discrete, uninterrupted, nonrecurring);
 - d) duration (year, month);
 - e) spatial dimensions of impact (depth, size, form, impact zones).

Significant types of impact: out of the initial list must be selected the impacts of the highest intensity, longest duration, significant area of impact and those affecting particularly sensitive areas (extraordinarily protected territories);

- impact mitigation measures;
- environmental monitoring program for the entire “life cycle” of the object.

This stages must be completed with the preparation and drawing up of the Environmental Impact Statement (EIS), which must be presented to all the interested parties – authorities, management and supervision bodies and the public.

The environmental and economic assessment.

EIA economic estimates must be done in the following way:

- do complete public cost estimates for proposed options accomplishment considering all the detected effects;
- conduct additional assessment depending on calculation objectives and detected positions, for instance, financial benefits, compensation payments, specific negative effects mitigation or elimination costs etc.;
- do a comprehensive environmental and economic calculation to summarize all PROs and CONTRAs in terms of cost;
- comment on assessment findings according to the public interests scale and with the use of indicators unavailable in value terms;
- do approximate estimates of object’s cost-efficiency with regard for the price development of raw materials, inputs and final products as well as for variable sources of original crude and complete sets of equipment etc.;
- object’s cost-efficiency must be estimated within financial self-sufficiency according to the existing tariffs and prices.

The estimates should include production and sale costs, manufacturing and social infrastructure operations and maintenance costs. The consumption of natural resources and utilization of waste processing and burial services of outside organizations are estimated according to the fixed tariffs under the existing payment procedure.

- cost efficiency is estimated in relation to the project implementation with regard for all the consequences including project cancellation.

Stage 3 – Environmental effects detection

- EIS public hearings organization.
- Public hearings' results registration.

The goal of this stage is to detect environmental, social, economic and other relevant effects of intended activity in this territory at certain time. The detection of effects has to be done with the assistance of EIS public hearings. The participation of the public is to form different groups' opinions as to the project implementation based on research findings and project information submitted to them. These public hearings must result in a document (protocol) to be the basis of making changes to the project with additional surveys conducted. The general criteria of social effects detection may be population's health and security, possible move to other districts, changes in usual living conditions and traditional forms of employment, proximity to recreation zones, natural reservations, archeological, ethnic and historic monuments. The degree of public concern must be identified based on this information. This information is subject to being a part of EIA materials.

Stage 4 – Project adjustment

The goal of this stage is to forecast environmental condition changes which will follow project implementation. The forecast has to be done for those natural components, which, if impacted, will cause apparent and undesirable effects detected at the EIS preparation stage. These changes may occur to the quality of atmosphere, land resources, surface and underground water, hydro-geological, hydrological, engineering-and-geological, seismic and other conditions. This stage envisages the development of project monitoring required for control over hardly forecasted environmental changes. The project monitoring is required by the projects, which are not clear about environmental impact and its mitigation measures, when its project proposals implementation is experimental or they may change due to certain circumstances or have the possibility of irreversible changes or the project decision making may change in such a way to end up with quite serious impact.

Annex M. Use of Herbicides

Herbicides with active material of Glyphosate registered to apply in the Kyrgyz Republic: dominator 36%, VR, GliTERR 36%, VR, Glyph-art 36%, VR, Heracles 36%, VR, Glyphogan 36%, VR, Glyphosate 41% VR, Uragan 48%, VR, Uragan Forte 50%, VR, Vortex 36%, VR, Ercampo 36%, VR, Glyphgore 48% VR.

They are applied for treatment of vegetating weeds in plantations of perennial crops at the rate of consumption of 2-4 l/ha to control annual cereal and bilobular weeds and 4-8 l/ha to control perennial cereal and bilobular weeds at many agricultures, forest plantations, meadow lands, to control water vegetation and also at lands of non-agricultural value. Preparations including glyphosate are to be applied once a year for the purpose of devastation prevention at the same rate of consumption. Average cost of the herbicides with active material of glyphosate is **400 som/l (10\$)**. Application and storage of pesticides are to be in line with «Guidelines for safe application, storage and warehousing of pesticides in agricultural industry» Decree of KR MAWI & PI as of 26.11.2001.

Training on the use of pesticides (herbicides)

In many cases, farmers' primary sources of information and advice on pest management and pesticide use are pesticide distributors or sales staff who represent a special interest and are not likely to advice on non-chemical alternatives or cultural techniques to prevent the pest problem in the first place. Extension workers should be prepared to advise farmers on alternative pest management approaches, cost aspects of various control options, and, where chemical control remains desirable, on the proper selection, handling and use of pesticides and their hazards. To avoid conflicts of interest, extension services should not receive income from selling pesticides.

Training and information may also be required for retailers and farmer groups or cooperatives involved in the sale or distribution of pesticides. Ideally, pesticide retailers should be licensed, with appropriate training as a prerequisite. Training of medical staff at rural health clinics in recognition and treatment of poisoning symptoms may be required alongside with the provision of antidotes.

Agro-chemical companies, and their associations, have been running safe-use training programs. Motivation for providing such training has included: response to pressure for regulatory action against products that cause a high incidence of farmer intoxication; product promotion; product stewardship. Several reports published in 1999-2000 questioned the effectiveness of such training (Ref.). Proper use is not only determined by user knowledge but also by availability and use of affordable protective gear, appropriate application equipment and appropriate storage facilities. Training does not solve absence of these pre-requisites for proper use. Training should therefore be seen as additional to regulatory use restrictions aimed at protecting farmers from intoxication, and not as a replacement of such restrictions.

Protective gear

Simazine and Roundup are readily absorbed through the skin or through inhalation and therefore require consistent use of appropriate protective gear. Requirements for personal protection should be indicated on the pesticide label. Other sources should be available if this information is missing (e.g. web-site of manufacturer, various other web-sites with product information, WHO personal protection recommendations for specific Hazard Classes, FAO guidelines). Wearing the proper equipment reduces herbicide exposure is essential. Depending on the level of hazard, protective gear may range from long-sleeved shirts, long pants, and enclosed shoes, to chemical resistant gloves, footwear, headgear and apron, plus goggles and respiratory protection ranging from simple dust masks to fully enclosed gas masks. Coveralls over regular work

clothes provide good protection. Coveralls that can be thrown away after spraying may be available. Use of protective gear is often hampered by discomfort of its use in hot climates. Moreover, protective gear is often not available in rural areas or is not affordable to farmers.

Improper use of protective clothing can increase risks (e.g. contaminated clothing can greatly increase pesticide absorption through the skin). Protective gear also needs regular replacement. Particularly respiratory protection masks or filter cartridges need to be replaced according to recommended replacement schedules (humid and dusty environments may require daily changes). However, timely replacements are rarely made. There are many different types of masks that serve different purposes. An internationally used coding system indicates the protection it gives for different hazards. The hazard of organic vapors requires a different type of filter compared to toxic dust. Multiple hazards (dust and vapor) require special combination filters. Such filters are expensive and require regular replacement. Not all dust filters protect against toxic dust. Specialist advice is required to determine appropriate respiratory protection. Use of half-masks or full-masks in the tropics is very uncomfortable and filters do not last long in high humidity.

Particularly in developing countries, the reality is that the majority of farmers use pesticides without adequate personal protection. Training usually cannot solve this problem. This is the reason for the exclusion of products that fall in WHO Hazard Class I and broad restrictions on Class II products for Bank financing.

Application equipment: A common cause of pesticide intoxication is poorly functioning or leaking equipment. Farmers often continue to use old equipment because they cannot afford to replace or repair it. Also, spare parts and knowledgeable technicians are often hard to find.

Any procurement or distribution of pesticide equipment should therefore take into consideration the availability of local repair services and users' knowledge of equipment. A good supply of spare parts and training of retailers to provide equipment maintenance and repair services may be necessary when selecting equipment. Tenders for procurement of pesticide equipment should set very specific and high quality standards, because otherwise suppliers may be tempted to compromise on the quality in order to table lower bids.

Packaging and Labeling

The International Code of Conduct on the Distribution and Use of Pesticides, and associated technical guidelines, provide internationally accepted general standards on packaging and labeling. OP 4.09 refers to these guidelines as standard for Bank practice. However, domestic regulations that set more stringent standards than the FAO guidelines must be adhered to.

When procuring pesticides, product specifications should include packaging requirements. Packaging should be of appropriate type and size. Empty pesticide containers are considered hazardous waste and generally cannot be cleaned to make them safe for other purposes. Careful selection of packaging can help avoid problems. For instance, containers that are attractive as water jerrycans should be avoided. Small package sizes help avoid on-farm storage problems. Designs and materials of packaging should be able to withstand anticipated levels of handling, climatic conditions and prolonged storage under sub-standard conditions.

Procurement documents must also specify that labeling follows the principles provided in Guidelines on Good Labeling Practice for Pesticides (Rome: FAO, 1994). Labels should be in the local language.

Intermediaries in developing countries often purchase pesticides in bulk and then repackage them. Often the repackaged pesticides go into inadequate containers with little or no labeling. Pesticides procured for distribution to small-scale farmers, or individuals for public health vector control purposes, should as much as possible be single-dose packages or small containers. The general rule is that repackaging should be avoided. If repackaging is to be done, the facilities, materials and procedures should be audited by an independent expert as part of project preparation. Repackaging should be permitted only in properly licensed and inspected facilities that meet acceptable safety standards. Active ingredients or products that fall into WHO Hazard Class II should be handled under the control of the bulk supplier,

who should resume full responsibility for the suitability of the new package, including label and use instructions, the quality of the repackaged product, and the safety of the repackaging process. (Class I is not relevant because procurement of products in this Class is not permitted under OP 4.09). The FAO guidelines on labeling and packaging also apply to repackaged products.

Transportation and storage

International transport of pesticides is regulated by several international Conventions based on the *UN Recommendations on the Transportation of Dangerous Goods*. The two most relevant are the *IMO International Maritime Dangerous Goods Code* for shipment by surface, and the *IATA Dangerous Goods Regulations* for air transport, which both apply to pesticides. Some countries may have national legislation regulating the in-land transport of dangerous goods, but many have not. Inland transport may pose several risks that are often increased by the condition of lorries and roads. Specific risks include storage in the port and transport through densely populated or protected areas. A hazard assessment may be appropriate for transport of large volumes of pesticides that pose risks to human health or the environment.

A significant proportion of pesticide stores in developing countries does not meet minimum requirements for such stores: location at safe distance from water and human dwellings; compound fenced and access limited to authorized staff; floors of impermeable concrete; ramps to contain leaking liquids; adequate ventilation; doors under lock; store keepers trained in handling pesticides; emergency shower facilities; adequate quantities of materials and protective gear to deal with emergencies. There have been several cases where pesticide stores burnt down as a result of poor management. These accidents caused severe environmental contamination. On-farm storage practices for pesticides are very often not safe.

Legal Aspects related to import and transportation of herbicides and agro-chemicals

Department of chemicals and plant protection of the KR issues the following licensing documents: 1) Certificate of state registration of pesticides and (or) agrochemicals, and 2). Conformance Certificate of pesticides and agrochemicals Both of these licensing documents are regulated by Law of the Kyrgyz Republic "On the chemicals and plant protection".

For import of herbicides to the territory of the Kyrgyz Republic they should be registered and permitted for application, they should have certificates of origin and conformance. Authorization for import and customs clearance upon separate importation requires obtaining a licence in the State Department for Plants Chemicalization, Protection & Quarantine under KR MAWI & PI (government body to control and ensure safe application with pesticides and other agrochemicals) and submission of copies of the Contract, invoice and above mentioned certificates.

Persons and legal entities in accordance with their work must ensure the safety for human health of the work and services, as well as production of industrial- technical purposes, food products and goods for personal and household needs during its production, transportation, storage, realization to population . Potentially dangerous to humans chemical, biological substances, and certain types of products are allowed to manufacture, transportation, purchase, storage, sale and application (use) only after the state registration and if the recommendations on the transportation, use, storage and packing label with a warning inscription are available. The list of chemicals and pesticides whose use is prohibited and subject to prior informed consent procedure is approved by Regulation #376 of the Government of the Kyrgyz Republic dated July 27, 2001.

Transportation of pesticides and agrochemicals is permitted only in specially equipped vehicle, storage is permitted in special vaults. Seller must be specially trained and can sell pesticides and agrochemicals that have passed state registration and introduced into the State Catalogue. Application process is determined by a special authority of executive power. Advertising of failed state registration pesticides and agrochemicals is prohibited.

The manufacturer (performer, seller) is obliged to provide consumers with necessary and accurate information about goods (works, services), ensure possibility of the right choice. The list of certain types

of goods (works, services) and the ways to inform consumers are established by the Government of the Kyrgyz Republic.

Annex N. Mitigation Plan

Stage	Issue	Mitigation measures	Funds for mitigation measures	Responsible
Within Component A.	Effect from small-scale construction works at specially protected natural areas (improvement of roads, reconstruction of buildings, irrigation infrastructure, and etc.).	Preparation by contractor of plan-guidelines on environment protection. They will be studied by SAEPF to develop if they meet requirements of ecological expertise before funding or commencing construction. All contracts for construction works should meet standards on environment protection, health and safety required by legislation of the KR and WB procedures.	US\$1000	Contractors, project management, TSEDP, SAEPF, environmental inspection etc.
	Management of solid wastes and wastewater as a result of tourism infrastructure activities.	Observance of existing ecological and sanitary norms and rules in commissioning of tourist sector infrastructures. TSEDP project under realization of MPG Component requires that in granting applications for realization of tourism activity it should be obligatorily shown observance of ecological and sanitary norms and rules.	Not required	SAEPF, LSG bodies, TSEDP project management, sanedipstation etc.
Within Component B.	Increased competition for irrigation, and increased competition for obtaining access to irrigation infrastructure.	Collaboration with public AWU, allocation of irrigation quotas and ordering of reception for watering plantations of rapid-growing stocks. TSEDP project organizes training on agrotechnology, selection of types within nature and climate conditions.	US\$3000	TSEDP project management, AWU, etc.
	Long-term demand for irrigation in areas with scarce water resources (depending on local hydrogeology)	Selection of stocks within nature and climate conditions, observance of agrotechnology. TSEDP project will submit with necessary training programs on planting agrotechnology for forestry personnel.	US\$2000	TSEDP project management, forestry etc.
			Not required	TSEDP project management

<p>Negative impact for soil quality under preparation of areas (for example, cleaning, plowing).</p>	<p>Correct design of planting of wood species, permanent grasses and controlling observance of developed design decisions of Contractors. Development of Plans on fire prevention and its realization. Risk analysis, Promotion of appropriate fire management practices and monitoring; Conducting of training and actions for local population, on carefulness to forest resources and fire safety.</p>		<p>forestry, LSG b beneficiaries et</p>
<p>Increase of fire hazard</p>	<p>TSEDP project will ensure corresponding trainings for forestry personnel and participants of the project on creation of plantations of fast-growing wood species and on training of integrated pest management, usage, storage and transportation of pests and other progressive forestry practices.</p>	<p>US\$1000</p>	<p>TSEDP project forestry, LSG b beneficiaries et</p>
<p>Non-regulated usage of pesticides and herbicides</p>	<p>ARPF, including the following components: Information Campaign, Access-Restriction Management Groups, participatory validation of sites, assistance in improvement or restoration of livelihoods (in exceptional cases; e.g.);</p>	<p>US\$3000</p>	<p>SAEPF, Depart of plants protec MAWCPI, TSE project, forestry bodies, benefic etc.</p>
<p>Access to pasture areas, reduction of existing pastures.</p>	<p>TSEDP project will prepare Strategy of Social Responsibility that will include: training programs for information, activity on plan development for making decisions on usage of resources, development of compensation measures, principals of joint participation in monitoring and evaluation.</p>	<p>US\$4500</p>	<p>SAEPF, Depart of pastures of MAWCPI, TSE project, forestry bodies, benefic etc.</p>
<p>Allocation of project benefits between the stakeholders</p>	<p>It will be realized selection of quick growing wood species excluding allergic risks from poplars. Selection of cuttings for</p>	<p>US\$3000</p>	<p>TSEDP project forestry, LSG b</p>

	Allergic risks (for example, poplar seed tufts)	seedling will be from males that do not cause allergic reactions.	Not required	beneficiaries et TSEDP project forestry, LSG b beneficiaries et
TOTAL			US\$17500	

Annex O. Ecological monitoring Plan

Stage	Reviewed indicators	Placement of reviewed indicator	Method /equipment	Measuring frequency	Monitoring costs	Responsible
Input data	Quality of water, soil and vegetation: turbidity, concentration of herbicide, pesticide, insecticide.	Design areas, water delivery points.	Field equipment for sampling, vegetation examination, sampling for laboratory analysis.	Before starting construction works at project areas, at the area of insecticide usage.	US\$2960	TSEDP project, SAEPF
Within Component A	1. Effect from small scale construction works at specially protected natural areas (improvement of roads, reconstruction of buildings, irrigation constructions etc.)	Site areas. Special attention will be concentrated on requirement on restoration of the area to initial condition after completion of construction works.	Inspections at site areas. During environment monitoring at site area there will be water sampling at site area and at neighboring areas.	Site control performed will be before, during and after competition of construction works.	US\$4800	TSEDP project, SAEPF
	2. Management of solid wastes and wastewater as a result of tourism infrastructure activities.	At the places of site investments	Draw off and analysis for salinity, presence of agrochemicals etc.	Before realization of MPG, in realization and after realization of MPG	US\$3000	TSEDP project, SAEPF
Within Component B	1. Increased competition for irrigation in areas with scarce water resources	At the places of site investments, areas where it is created plantations.	Monitoring of usage of irrigation water	Before realization of the project, during vegetation period and in autumn.	US\$2100	TSEDP project, SAEPF AWU, Aiyl Okmotu, beneficiaries
	2. Long run	At the	Monitoring of	Before	US\$2100	TSEDP

demand for water to support forestry at some typological water areas (depending on local hydrogeology)	places of site investments, SFF areas, areas where it is created plantations.	usage of watering water	realization of the project, during vegetation period and in autumn.		project, SAEPP AWU, forestry, beneficiaries
3.Negative impacts for soil quality under preparation of areas (for example, cleaning, plowing).	At the places of site investments, areas where it is created plantations.	Inspection of erodibility of soils.	Before realization, during realization and after realization of the project.	Not required	TSEDP project, SAEPP AWU, forestry, beneficiaries
4.Increase of fire hazard.	At the places of site investments, areas where it is created plantations.	Inspection for area fire risk, monitoring of conducted training programs and fire safety actions	Before realization, during realization and after realization of the project.	Not required	TSEDP project, SAEPP AWU, forestry, beneficiaries
5.Non-regulated usage of pesticides and herbicide.	At the places of site investments, areas where it is created plantations.	Water sampling for identification of water quality and presence of agro-chemical rests in surface water flows.	Before realization, during realization and after realization of the project.	US\$3000	TSEDP project, SAEPP.
6.Access to pasture areas, reduction of existing pastures.	At the places of site investments, areas where it is created plantations.	Monitoring of Assistance Programme, social and economical reviews.	Annually	US\$1000	TSEDP project, SAEPP, Department of pastures of MAWCPI, forestry, beneficiaries etc.

7. Allocation of project benefits between the stakeholders	At the places of site investments.	Social and economical reviews.	Starting from the 2 year of realization, annually.	US\$15000	TSEDP project, forestry, LSG bodies, beneficiaries etc.
8. Allergic risks (for example, poplar seed tufts)	At the places of site investments, areas where it is created plantations.	Inspections of species structure and plantations condition of quick growing wood species with usage of corresponding checklists.	Starting from the 2 year of realization, annually.	US\$2400	TSEDP project, SAEPP, forestry.
			TOTAL COSTS	US\$36360	

Annex P - Minutes of the public hearings to discuss the draft social & environmental assessment of the “Tien Shan Ecosystems Development” Project

Public hearings were held on February, 10 2009 in Bishkek at the ARIS conference premises and on February, 12 2009 in Almaty at the premises of the Regional Environmental Centre.

In Kyrgyzstan 33 people were invited and announcement was published in “Vecherniy Bishkek” national newspaper. 23 people attended (the list is attached). The participants were SAEPF, Jogorku Kenesh and Government officials, representatives of World Bank, ARIS, JICA Project, NGOs of KR and Uzbekistan.

Participants were informed on TSED components, goals and objectives.

Following topics were discussed:

- Possible impacts of project implementation;
- Mitigation measures if negative impacts are the case;

The following conclusions were made as a result of discussion (detailed minutes are attached):

1. To make maximum efforts to focus planting activities within flood plain forests.
2. Water intake for planting purposes in KR will not have impact on water intake in Uzbekistan. The volume of water intake that Uzbekistan is currently consuming causes salinization and degradation of soil.
3. To avoid disputed lands upon selection of lands for forest planting and reforestation purposes.

Participants of public hearings, PIU staff, the company conducted ESA agreed that:

1. Specified mitigation measures of possible negative impacts are sufficient.
2. To focus attention on restoration of flood plain forests during project implementation.

In Kazakhstan 35 people were invited and announcement was published in “Kazakhstanskaya Pravda” national newspaper. 33 people attended (the list is attached). The participants were representatives of reserves, RK NAS, REC, project organizations, NGOs. The official representative of Forestry & Hunting Industry Committee was GIS TERRA Company. Participants were informed on TSED components, goals and objectives, outcomes of Western Tien Shan Biodiversity Conservation Project and 5 KZ SPNA that will be involved in the TSED project.

Following topics were discussed:

- Possible impacts of project implementation;
- Mitigation measures if negative impacts are the case;

The following conclusions were made as a result of discussion (minutes are attached):

1. Not to include alien tress among those to be planted.
2. Environmental tourism existing in Kazakhstan has some image problem; in this connection it was suggested to rename the component as sustainable or controlled tourism.
3. To make use of lessons learnt within the first phase of the project.

Participants of public hearings, PIU staff, the company conducted ESA agreed that:

1. Mitigation measures of possible negative impacts as specified in the Social and Environmental Assessment are sufficient.
2. To focus attention on conclusions during project implementation.
3. To establish the group in Kazakhstan to prepare GEF project.

List of participants of open public hearings of the social and environmental assessment of the “Tien Shan Ecosystems Development” Project

**February 10, 2009
Bishkek, Erkindik 2.**

№	Name	Organization
1.	Akmatova S.	Agricultural sector and Environment department under the JK of the KR
2.	Kupueva A.	Operational officer from WB office in Bishkek
3.	Kimura Yuzuru	Chief adviser
4.	Machida Reta	Coordinator of Project on support to joint management of forest resources (JICA)
5.	Uzgenov A.	Forest ecosystems development department, Head of monitoring division
6.	Toktogulova K.	Department of Information and Analytical support, SAEPF programmes and policy development
7.	Shmeleva T.D.	Leading expert of SAEPF Environment Monitoring Department
8.	Imanaliev T.	SAEPF Department of specially protected natural areas & biodiversity conservation
9.	Chekirov A.	ARIS Deputy Executive Director
10.	Domashov I.	BIOM Environmental movement
11.	Gorborukiva G.D.	Consultant, American University in CA
12.	Shukurov E.Dj.	«Aleine» EMK
13.	Asylbaeva Sh. M.	«Aleine» EMK
14.	Sultanbaev M.	Consultant, ARIS
15.	Ionov R.N.	Scientific associate, Biology & Soil NAS Institute
16.	Orolbaeba L.E.	Consultant, Director of the Institute of Ecology of Water Resources & Desertification Problems
17.	Gabrid N.V.	Consultant, Forest NAS Institute
18.	Abdykadyrova J.	Chairwoman of “APA” Public Fund
19.	Mambetov A.	“Centre of civil initiative” NGO
20.	Mambetaliev U.A.	TSED Manager
21.	Haupt F.	TSED International Consultant
22.	Terlyga J.	TSED Office-manager/translator
23.	Shaimardanov A.	“Chirchik-Daryo” NGO, Uzbekistan

**February 12, 2009
Almaty**

№	Name	Organization
1	Rysakova J.	WB Office in Almaty

2	Mambetaliev U.A.	TSED Manager, Bishkek
3	Orolbaeva L.E.	Consultant, Director of Water Resources Ecology and Desertification Institute, Bishkek
4	Shukurov E.Dj.	Consultant
5	Ogar N.P.	Consultant, chief manager of GIS TERRA projects
6	Valdshmit L.	Consultant, GIS TERRA
7	Belousova L.K.	GIS TERRA
8	Utyasheva T.G.	GIS TERRA
9	Kihtenko L.	Deputy Director of CA REC
10	Mirhashimov I.H.	Manager of REC projects
11	Sadykova Ch.	Coordinator of CA REC country offices
12	Genina M.	CA REC Manager
13	Kim S.	UNDP, GEF SGP Coordinator in Kazakhstan
14	Togoibaev A.	Deputy director on scientific & research issues of Aksu-Djabagly SNR
15	Adilbaev J.A.	Director of Karatauskiy SNR
16	Sokolova G.	Deputy director on scientific & research issues of Karatauskiy SNR
17	Mansurova M.N.	Head of Scientific Department of Charynskiy SNNP
18	Tebaev I.A.	Scientific Department of “Kolsaiskie ozera” SNNP
19	Ivashenko G.A.	Scientific Department of Ile-Alayauskiy SNNP
20	Ustiugova K.I.	Community Union KZ “Ecoproject”
21	Nazarchuk M.N.	Community Union KZ “Ecoproject”
22	Bekturova G.B.	Expert of “Farmer of Kazakhstan” Public Fund
23	Levin V.G.	Chairman of “Farmer of Kazakhstan” Public Fund
25	Rysakova N.E.	“Naurzum – southern branch” NGO
26	Danilov M.P.	Botany NAS Institute
27	Grachev U.A.	Zoology NAS institute
8	Kovshar V.A.	ASBK
29	Aladyina A.P.	ASBK
30	Rodionov A.M.	“Conservation of in-situ mountain agrobiodiversity in Kazakhstan”
31	Sratar S.	“Zelenoye Spasenie” NGO
32	Strikeleva E.	“Ecoidea” NGO
33	Gordienko O.B.	“Urpak” NGO

Detailed Minutes

Bishkek, ARIS 12 February, 2009

Mambetaliev U.A. Welcome speech. The announcement about public hearings for discussion of Environmental & Social Assessment of the Tien Shan Ecosystems Development Project was published in “Vechniy Bishkek” newspaper. 33 people were invited to public hearings, 23 people are those present. Let me present Tien Shan Ecosystems Development Project and Environmental & Social Assessment Report within the framework of Tien Shan Ecosystems Development Project prepared by the Institute of Water Resources Ecology & Desertification Problems, consultants from the Kyrgyz republic and Republic of Kazakhstan. Tien Shan Ecosystems Development Project is a second phase of Transboundary Project for Conservation of Western Tien Shan biodiversity implemented within the territories of three countries: Kazakhstan, Kyrgyzstan and Uzbekistan in 1999-2006. Then he provided information about Tien Shan Ecosystems Development Project and its components.

Orolbaeva L. Presented report on environmental & social assessment within the framework of Tien Shan Ecosystems Development Project.

Uzgenov A. What is a certified hydrocarbon?

Mambetaliev U.A. Climate change results from surplus of greenhouse gases. Upon cultivation of forest plantations we obtain the volume of absorbed greenhouse gases. There is a special methodology for assessment of volumes. F. Haupt is an expert in this field, you can ask her.

Ionov R. Report uses the terms of species and semideserts that are not applied in Kyrgyzstan.

Shukurov E. They are equivalent names. They are based on provisions connected with documents on land degradation. We use them in order to be in line with official terminology.

Uzgenov A. If access restriction is the case, will material compensation be provided?

Orolbaeva L. Pursuant to the policy of World Bank compensation measures on access restriction should be developed even in that case if lands of forest inventory are illegally used. Such compensation measures were developed.

Domashov I. Will flood-plain communities be involved in the project?

Mambetaliev U.A. Flood-plain forests locating within the territory of the forest inventory will be involved for planting. There a set of criteria for selection of these lands. It should be a tract of not more than 10 Ha. It can be one tract or several tracts within the same forestry or flood plain. As concerns lands of ayil districts – selected lands should be those having no tree & shrub vegetation.

Toktogulova K. Will you finance planting of a big number of species or some specific species? Will existing nurseries be used?

Mambetaliev U.A. The project covers costs for support of both state nurseries and private ones. Small technical equipment will be purchased, ayil okmotu will be provided funds for purchase of planting stock. Project will contribute to State Forest Fund in tillage.

Toktogulova K. Who will compose the group controlling access restriction?

Mambetaliev U.A. Officials of ayil districts, members of local councils (ayil Kenesh), land users, NGOs and youth will compose the group of control. The primary criteria for selected lands are absence of conflict. Now 36 000 ha are proposed and only 7 000 ha will be selected.

Chekirov A. Relevant works will be implemented on the lands where specific micro-project groups will be selected to deal with that kind of work. It can be a family, farm etc. Groups will be established on the basis of those groups that are operating in the field of rural investments. Project design foresees reduction of conflicts to their minimum within these lands. Agreements contributing to sustainable forest planting are envisaged. Micro-project group will be expected to reorganize so this group can be more sustainable.

Toktogulova, K. What is the duration of the project?

Mambetaliev U.A. 5 years.

Gabrid N.V. Do you plan to set forest belts within agricultural areas?

Mambetaliev U.A. Recently the forest definition was approved. It is possible if the forest belt is in line with accepted parameters. Minimal area is 0.3 ha, crown coverage is 30% of total area.

Shaimardanov A. People planted forest. Will they receive something from biocarbon fund or all fund will flow into national budget? Who will control not to cut tree plantations before certain phase and how does people benefit from it?

Chekirov A. It is planned that funds of biocarbon fund will be divided into 2 parts. One part is designed for forestry sector and second one will be allotted to the areas planted by local communities. The scheme for biocarbon field will be developed. Also it is possible to transfer fund to the committee that will allocate funds. It is important to persuade people not to cut down plantations before certain period. Micro-project groups make proposals describing what kind of trees they will plant. First part is formal and second part is a calculation of cost-effectiveness. We have 12 species of plantation that we plan to plant. Thus, micro-project group will already know what she can expect after 5 or 10 years. She will be aware of cost-effectiveness expected to be after certain time passed.

Kupueva A. When we are talking about 7 000 ha to be planted we mean those that will be known after criteria-based selection. Pursuant to the legislation economic analysis will be implemented as well. I have a question – what is the current state of water resources?

Mambetaliev U.A. I'd like to add concerning sustainability. The key investments will be during first years when there will be a need in purchase of planting stock. The Project will assign funds for these purposes. The project doesn't cover all costs; people also invest their own funds. At present we are dealing with one pilot area located in Chui valley. 80% will belong to those who will deal with it. It will be a base for motivation of people. There are three river basins in our country. During project implementation we will deal with Syrdarya and Talas basins. The policy of World Bank stipulates mandatory notification of countries located downstream about the project to be implemented. And in the case if these countries oppose, World Bank has the right for option either to finance this project or not. Indeed, the volumes of water intake required for planting purposes are very low. Syrdarya – 8000 cub m per ha per year, 0,06% of water flow will be used for irrigation purposes.

Shaimardanov A. And if the conflict of interests is the case, what will you do?

Mambetaliev U.A. It is also possible. We make project within those lands that have been irrigated before. If the conflicts are the case, we will strive for conflict resolution.

Kupueva A. These calculations were verified by water industry officials and in the case if the party implementing the projects avoids notifying the countries located downstream, then this party bears a full responsibility. If another party rejects, the Bank has the right to establish the committee of experts.

Uzgenov A. I have suggestion to use drought-resistant species fro planting purposes.

Shaimardanov A. I guess that part of water used by Uzbekistan is of benefit and part of this water causes the damage. I'd like to make a statement that Uzbekistan needs half of those waters actually used for irrigation purposes. The remained water cause soil degradation, reduction of water supplies will be of benefit for Uzbekistan, this is my personal opinion. Water industry involves a huge number of financial resources; cotton monopoly causes a great damage. It is unknown how Uzbekistan can overcome this vicious circle.

Mambetaliev U.A. The point is that the project was Transboundary and Uzbekistan was to take part in it but then refused.

Kupueva A. Each transboundary state signed the conventions stipulating obligatory implementation of water supply commitments. They should fulfill commitments with regard to their partner from other countries.

Shaimardanov A. A lot of things depend on measures to improve planting conditions.

Shukurov E. It is needed to distinguish new forest plantations and restoration of previous forests. It is highly advisable not to hold plantation farms. The project aims at restoration of Tien Shan ecosystems but not creation of new ones.

Domashov I. The report specifies that the committee will be composed of ayil okmotu officials; it is primarily envisaged to establish field groups. And what will be the further steps when the next phase of the project will come? For instance, local community makes a decision that there will be fields though before there were birches. It will lead to displacement of ecosystems.

Mambetaliev U.A. The same species will be planted where there were forests. Quickly growing species of plantations will be cultivated where there were no forests.

Shukurov E. With the view of making an appropriate decision within the framework of this project there is no need to make them have a professional level of developers. The point is that they should see the benefit of these plantations. They should be aware of concrete benefit of this project. This is a competence. If they consider it insufficient competence, they have the right to reject this project. Selection of micro-projects will be competition-based both within ayil okmotu and between ayil okmotu. The competence they have is enough to make a proper decision.

Mambetaliev U.A. May be representatives of JICA Project for support of integrated forest management have the questions?

Machida Reta. Thank you a lot. We have a small list of questions that we would like to clarify at the meeting tomorrow.

Shaimardanov A. The technology of community-based forestry was created in Karakalpakiya, the aim of this project was to create forestry communities. Do you plan to create a legal organization or some kind of legal body that will be able to deal with community-based forestry management?

Mambetaliev U.A. All rational things of community-based forestry management are transferred to our project and will be applied. In order to implement micro projects ARIS has a developed and tested methodology to organize people into groups with legal liability.

Kupueva A. ARIS is an agency dealing with communities and it has a considerable experience in this field. This project will use those technologies that are applied by ARIS.

Almaty, REC 12 February, 2009

Mambetaliev U.A. Introduction speech. As you know the announcement was published in “Kazakhstanskaya pravda” RK national newspaper and 35 people were invited to public hearings, 33 people are those present. Let me present Tien Shan Ecosystems Development Project and Environmental & Social Assessment Report within the framework of Tien Shan Ecosystems Development Project prepared by the Institute of Water Resources Ecology & Desertification Problems, consultants from the Kyrgyz republic and Republic of Kazakhstan. Tien Shan Ecosystems Development Project is a second phase of Transboundary Project for Conservation of Western Tien Shan biodiversity implemented within the territories of three countries: Kazakhstan, Kyrgyzstan and Uzbekistan in 1999-2006.

Orolbaeva L. presented report on environmental & social assessment.

Valdshmit L. presented information on previous phase of Western Tien Shan Biodiversity Conservation Project implemented within the territory of Kazakhstan.

Ogar N. specified specially protected areas of Kazakhstan covered by Tien Shan Ecosystems Development Project.

Orolbaeva L. Suggested to ask questions concerning presented report.

Danilov M. How will the project be implemented: separately within the territories of the republics or joint expeditions are foreseen? Will it be possible to visit specially protected areas of Kyrgyzstan?

Shukurov E.Dj. Since project is combined, exchange of experience is foreseen. Moreover, the experience obtained during implementation of Western Tien Shan Transboundary Project also will be applied within new project.

Mambetaliev U.A. It is envisaged that joint teams of consultants operating throughout the whole target territory will be organized within separate project directions.

Kiktenko L. It was several times mentioned that Small Grants Programme (SGP) will be implemented. Who will implement it? Please specify if Kazakhstan’s PIU will be established?

Ogar N.P. The possibility for establishment of PIU in Kazakhstan will be clear at the stage of preparation of Feasibility Study and after consultation meetings with all stakeholders.

Mambetaliev U.A. Small grants programme was a first phase of the project (Western Tien Shan Transboundary project). The priorities were identified and a specific methodology was developed for its implementation. Capacity of implemented SGP is considered to be significant and it will be used at second phase of the project as well. The issue will be under consideration. The executive agency will be located in Kyrgyzstan. Project implementation team will be in Kazakhstan, however the component has not been completed and the project foresees its further elaboration.

Rodionov A.M. I have two questions: 1) Does the proposed budget of 2,3 mln. USD cover funds for SGP? 2) You are talking about reduction of biodiversity pressure, but there is a widespread opinion that ecotourism damages biodiversity, what can you say on this matter?

Shukurov E.Dj. I agree with you that ecotourism is a threat for biodiversity. Though in comparison with other impacts on ecosystems the ecotourism is that most sparing. The project will undertake efforts to implement nature-friendly ecotourism. At this moment it is practically impossible to restrain the ecotourism trend. There is a need to put tourism within civilized limits. In this case ecotourism causes much lower damage.

Rodionov A.M. Do you know that GEF can deny financing development of ecotourism?

Shukurov E.Dj. The project already has a prior approval. We should thin over how to introduce it in certain framework. We will try to do it through the project, to put it in acceptable conditions.

Mambetaliev U.A. Yes, SGP funds are covered by indicated budget of 2,3 mln. USD.

Nazarchuk M.N. I suggest to replace the “ecotourism” term for “controlled tourism” as Kazakhstan has no ecotourism.

Ogar N.P. Russian people use the “ecotourism” term in SPNA (specially protected natural areas). It is not typical for RK. Certainly, there is an understanding of ecotourism but its conditions are not implemented.

Ivashenko G.A. On the base of Ile-Alatau State National Nature Park I can say that there is rather a recreation but not ecotourism. There are a high flow of visitors and a lot of garbage. Ecotourism conditions are quite different.

Nazarchuk M.N. And pursuit of profits in national nature parks is also not in line with the “ecotourism” term.

Shukurov E.Dj. If the issue of “Wild” tourism will be beyond of consideration at all, it can worse the situation. The situation is clear: there is no understanding and control at all levels. We will try to make something change through the project.

Ivashenko G.A. There is a need in broad explanatory work.

Kim S. I received a letter from GEF informing that ecotourism is not supported by World Bank. Although there was a reserve that business related to ecotourism is not prohibited, but another approach to this activity is required. The main issue is that this realm is closed and controlled. This should be considered at planning stage. Question: When it is planned to begin implementation of activities? Advice was to start activity in May, relevant document should be submitted. General words often sound good, but their implementation is doubtful. GEF provides 2 millions, but this amount is not enough at the Kazakhstan market. Will this involve World Bank’s credits? Taking into account crisis conditions it is not very suitable time for the project. Why did the question about allergic risks raise?

Mambetaliev U.A. It is necessary to prepare Feasibility Study by May. In Kyrgyzstan the tender for its preparation has been already announced. International consultant monitoring the process will be involved as well. The grant for preparation of Feasibility Study was not

accepted in RK and it significantly complicates the process of document preparation. Of course, we will do teamwork but extra funds will be required. Financing activity to be implemented within the project will be in compliance with Management Plans of RK SPNA. Each Management Plan will be analyzed and one general plan will be drawn up on their base. Each SPNA has its priorities requiring investments exactly now. Therefore the project will finance the key needs. We adhere to an opinion that even small amount of funds can make relevant contribution to reserves and parks. The project will be implemented under grant funds, no loans are foreseen.

Orolbaeva L. The assessment was carried out in compliance with the feasibility study that put forward the question about possible negative impacts of poplar planting and possible associated allergic risks. The assessment procedure of the World Bank envisages review of all potential negative impacts and development of mitigation measures.

Rysakova J. I'd like to clarify some moments: World Bank does not dictate what to do. The Client as represented by the governments exercises a concern of current situation; World Bank considers the possibilities to render assistance. Kazakhstan and Kyrgyzstan are quite different, therefore funding sources are also different. For last two years only grant funds are available for Kyrgyzstan (maximum grant is 15 mln. USD). In Kazakhstan the World Bank provides expertise, consultants etc. For instance, there is an on-going project on Irtysh-based belt-type pine forests with total budget of 68 mln. USD (including 5 mln. USD for SGP, 38 mln. USD assigned by RK Government and the rest part is grant of the World Bank).

Kim S. Is loan foreseen?

Rysakova J. The project that is under today's discussion doesn't foresee the loan for RK, there will be a GEF grant.

Kim S. It means that Kazakhstan should count on only 2 mln.?

Rysakova J. This is the matter of forestry sector. The Bank is happy to support any initiative, however it depends on national budget as well.

Sadykova Ch. Please tell me if the second phase of the project also envisages purchase of technical equipment? Will the experience obtained during implementation of the first phase be taken into account? All SPNAs survive at the expense of money that visiting people pay for their rest. And SPNA Law has the article concerning ecotourism. And my suggestion: I think it is better to use «sustainable» tourism term and identify it as activity aimed at sustainable development of economic & social environment.

Nazarchuk M.N. We deal with designing of national parks. Upon designing we set the pathways – environmental tourism itself is less than 1%. No need to compare with the experience of other countries since RK has its own specific environment. Nevertheless, park should survive. The weakness of park is that this tourism is out of control. They don't control how many vehicles enter and how much garbage is removed.

Sadykova Ch. I have a counter-question – Issyk-Kul has a status of bioserve – there are a lot of vehicles and tourists. Shouldn't we close everything there? We should think over how to write the feasibility study. We worked to develop the National Strategy for biodiversity conservation. WE made recommendations for sustainable tourism. And do you think that

somebody uses it? Nobody uses it now, it is very long process. Urmat knows it well, we are in global space, we strive for democratic principles, but it is time consuming process.

Mambetaliev U.A. You know at its final stage the project performs specific assessments of project outputs and outcomes. We carried out the analysis when the first phase was finished and reviewed all relevant strengths and weaknesses. All this information will be taken into account within the framework of our project. We will try to use this knowledge during the second phase of the project.

Grachev Y. My question as follows: the list of forest-generating species presented in Kyrgyzstan is doubtful. The point is that a muddle of things was made. There are species that don't pertain to Kyrgyzstan and there are species that are protected in natural parks. There are species that are dangerous for natural parks such as a pine. And more one remark – the species and green construction bodies are not specified. There are various types of poplar, marsh elder – more than 10 types. In the process of further work all these things need to be more specific. These are all my comments.

Shukurov E.Dj. Thank you for your remarks. As regards the issue concerning reforestation, certainly, alien species will not be planted in natural ecosystems. Ecosystem restoration will be applied for such species.

Forests can not be restored with the help of alien plantations. New species can be used only in completely destroyed forests. Not only certain species but the whole forest system needs to be restored. We had a grater concern with regard to destroyed or disappeared forests. Where overgrazing is the case. Bank insists on compensation measures to be foreseen. We should provide for these measures. In some cases it is even silly if forests will pertain to only 1-2 ha. However, we should specify why we have to draw their hectare. It is of high importance no to infringe upon poor people within the framework of the project. Therefore, we did not aim to distinguish all these species. Therefore, there is some mixing of species. Approaches and compensation measures are different. These issues should be clearly specified in feasibility study.

Mambetaliev U.A. Relevant species will be used upon different kinds of restoration. The annex to the report stipulates that restoration programme is based on tested methodology.

Kim S. To what extent is this project in line with other projects financed by World Bank?

Rysakova J. As regards RES construction, there is such project as transmission facilities are outdated. Actually the issue is under consideration, but when project is launched, preparatory works are implemented. During further development of the project it should not infringe upon previous projects. It is very complicated for World Bank. If there will be doubts that it can cause some damage for nature or human being – it will be under repeated consideration again and again. RES construction is still under consideration.

Kim S. Please take into account that development of Feasibility Study will require multilateral consultation meetings. There were precedents: some projects failed to take all factors into consideration, consequently the nature had relevant damages. It is of need to undertake maximum efforts in order to avoid such situations.

